

The Grasses of Virginia

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The group of wildflowers called grasses cover vast areas of the earth. Ten of the fifteen major crops are grasses. The Bible says, "All flesh is grass" and truly it is so for all animals including humans are dependent upon these grasses and other higher plants. The tremendous usage of cereals, wheat, oats, barley, rye, corn, sorghum, rice and millet, sugar from sugar cane and in the Far East, bamboo for everything from food to construction material is an indication of man's dependence on grasses.

Grass plants are singularly easy to distinguish from other plants because of their 2-ranked bladelike leaves. They may be confused with sedges but careful study of the plants should lead to easy separation since sedges have 3-ranked leaves and solid stems while grasses do not.

An idealized grass plant is shown in Figure 1. It is made up of a fibrous root system, a jointed stem, flat narrow leaves borne on the stem in two ranks, one at each node, and a terminal inflorescence made up of few to many spikelets. The aboveground part of the plant is called the culm. A typical inflorescence is shown in Figure 2. The spikelet is a reduced, modified shoot made up of a stem (rachilla), reduced leaves (bracts) at each node, and secondary reduced shoots (flowers) in the axils of the bracts. Bracts of the lowest pair on the rachilla do not have secondary reduced shoots and are known as glumes. The uppermost bract on the secondary shoot is the palea which is partially enclosed by a bract called the lemma. The flower consisting of stamens and a pistil occurs in the axil of the palea. The grass fruit (caryopsis) may be free from the lemma and palea or permanently enclosed by them.

This paper on the grasses of Virginia is a contribution to the Flora of Virginia which has been in preparation for a number of years. This flora is to be for Virginia what the Flora of West Virginia and the Flora of the Carolinas are for West Virginia and North and South Carolina, an assemblage of information including keys and descriptions about the plants found in the area.

The grasses presented here are those contained in publications by Massey (1961) and Harvill *et al.* (1986). The keys have been developed from Core *et al.* (1944), Hitchcock and Chase (1951), and Roane (1986). Descriptions of genera and species have been modified from Bowden (1959), Core *et al.* (1944), Hitchcock and Chase (1951), Bothmer and Jacobsen (1985) and Gould and Shaw (1983). Common names are found in Blomquist (1948), Hitchcock and Chase (1951), Gould and Shaw (1983), Brown (1979), Knobel (1980), and Terrell (1977). For species distribution by county and city, see Harvill *et al.* (1986).

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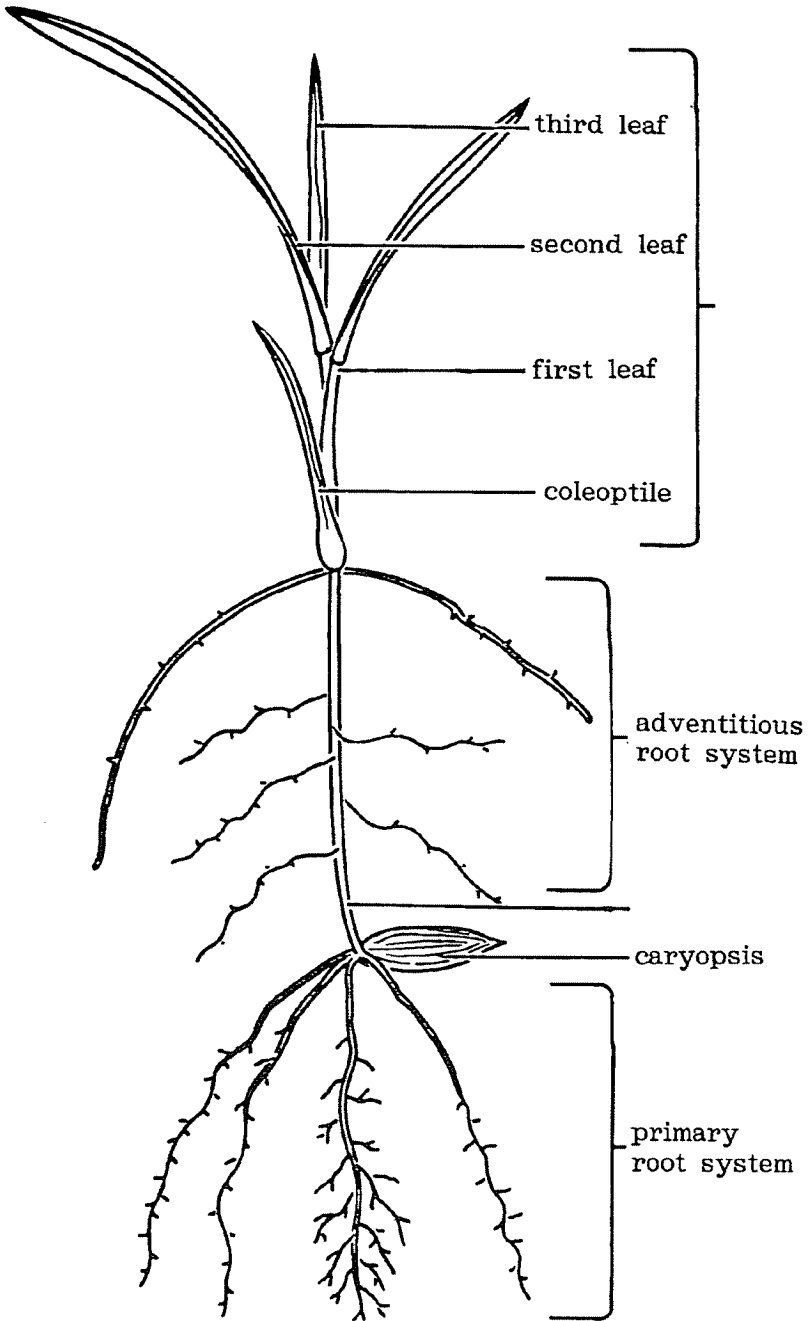


FIGURE 1. A typical grass plant. Drawing by J. D. Eisenback

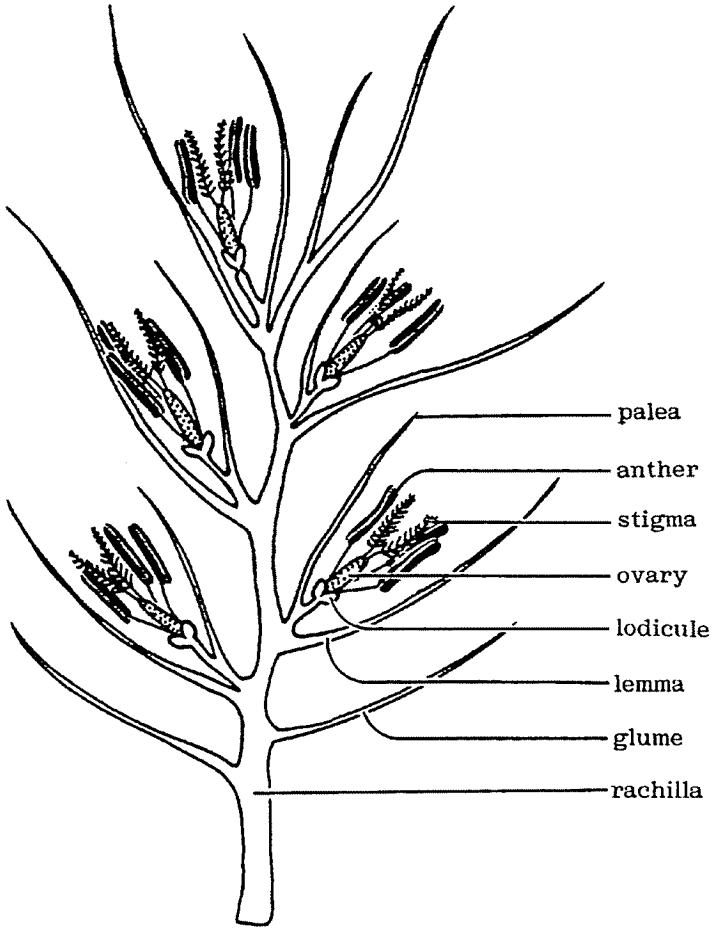


FIGURE 2. A typical grass inflorescence. Drawing by J. D. Eisenback.

KEY TO GENERA

- 1. Spikelets embedded in the joints of the rachis *Tripsacum*
- 1'. Spikelets not embedded in the rachis 2
- 2. Plants woody, culms perennial 3
- 2'. Plants herbaceous, culms annual 4
(plants may be perennial from below ground)
- 3. Culm terete; sheaths persistent *Arundinaria*
- 3'. Culm more or less flattened on one side; sheaths
nearly deciduous *Phyllostachys*

4. Spikelets with one functional flower 5
 4'. Spikelets with 2 or more functional flowers 27
 5. Spikelets single 6
 5'. Spikelets in pairs 19
6. Spikelets of two kinds *Amphicarpum*
 6'. Spikelets all of one kind 7
7. Spikelets subtended or surrounded by 1 to many distinct
 or more or less connate bristles forming an involucre 8
 7'. Spikelets not subtended by bristles 10
 8. Bristles persistent, spikelets deciduous *Setaria*
 8'. Bristles falling at maturity 9
9. Bristles not united at base, slender, often plumose *Pennisetum*
 9'. Bristles united into a burlike involucre, bristles
 retrorsely barbed *Cenchrus*
10. Glumes or sterile lemma awned *Echinochloa*
 10'. Glumes and sterile lemma awnless 11
11. Fruit cartilaginous-indurate, flexible 12
 11'. Fruit chartaceous-indurate, rigid 13
12. Spikelets in more or less digitate racemes *Digitaria*
 12'. Spikelets in panicles *Leptoloma*
13. Spikelets placed with the back of the fruit turned away
 from the rachis of the racemes, usually solitary 14
 13'. Spikelets placed with the back of the fruit turned
 toward the rachis of the spikelike racemes or pedicellate
 in panicles 16
14. First glume and the rachilla joint forming a swollen
 ring-like callus below the spikelet *Eriochloa*
 14'. First glume present or wanting, not forming a ring-like
 callus below the spikelet 15
15. First glume present; racemose along the main axis *Brachiaria*
 15'. First glume wanting; racemes digitate or subdigitate *Axonopus*
16. First glume typically wanting; spikelets plano-convex,
 sessile in spikelike racemes *Paspalum*
 16'. First glume present; spikelets usually in panicles 17
17. Second glume saccate, this and the sterile lemma
 much exceeding the stipitate fruit *Sacciolepis*

- 17'. Second glume not inflated-saccate 18
18. Basal leaves usually distinctly different from those in the culm, forming a winter rosette; spikelets of primary panicle not fruitful, becoming much branched, the small secondary panicles with cleistogamous fruitful spikelets . . . *Dichantherium*
- 18'. Basal leaves similar to the culm leaves, not forming a winter rosette; spikelets all fertile *Panicum*
19. Spikelets all alike, all perfect 20
- 19'. Spikelets unlike, the sessile perfect, the pedicellate sterile . . . 22
20. Spikelets surrounded by a copious tuft of hairs 21
- 20'. Spikelets not surrounded by tufts of hairs; racemes few . . . *Microstegium*
21. Rachis continuous, the spikelets falling; the spikelets of the pair unequally pedicellate *Miscanthus*
- 21'. Rachis breaking up into joints at maturity with the spikelets attached, one spikelet sessile, the other pedicellate *Erianthus*
22. Pedicel thickened, appressed to the thickened rachis joint or adnate to it; spikelets awnless, appressed to the rachis joint 23
- 22'. Pedicel not thickened, neither appressed nor adnate to the rachis joint; spikelets usually awned 24
23. Rachis thickened *Manisurus*
- 23'. Rachis slender *Eremochloa*
24. Blades ovate; annual *Arthraxon*
- 24'. Blades narrow, elongate; annual or perennial 25
25. Racemes of several to many joints *Andropogon*
- 25'. Racemes reduced to one or few joints 26
26. Pedicellate spikelets staminate *Sorghum*
- 26'. Pedicellate spikelets wanting, only the pedicel present . . . *Sorghastrum*
27. Glumes none 28
- 27'. Glumes 2, rarely 1 30
28. Spikelets strongly flattened, perfect *Leersia*
- 28'. Spikelets subterete in x-section, unisexual; all plants monoecious 29
29. Pistillate spikelets on the ascending upper branches of the

- panicle; the staminate on the spreading lower branches . . . *Zizania*
- 29'. Pistillate spikelets at the ends; the staminate below on the same branches of the panicle *Zizaniopsis*
30. Spikelets 3-flowered, uppermost floret in each spikelet perfect, the two lower staminate or sterile 31
- 30'. Spikelets 1-to many-flowered, no imperfect flowers below the perfect ones 32
31. Lower florets consisting of awned hairy sterile lemmas exceeding the fertile floret *Anthoxanthum*
- 31'. Lower florets reduced to small awnless scalelike lemmas, much smaller than the fertile florets *Phalaris*
32. Spikelets in 1-sided spikes or sessile on opposite sides of a zigzag rachis 33
- 32'. Spikelets in an open or contracted panicle 43
33. Plants monoecious or dioecious *Buchloe*
- 33'. Plants with perfect flowers 34
34. Spikelets in 1-sided spikes 35
- 34'. Spikelets on opposite sides of zigzag rachis 86
35. Spikelets with more than 1 perfect floret 36
- 35'. Spikelets with only 1 perfect floret; often with additional imperfect florets above or below 38
36. Spikes numerous, slender, racemose, on elongate axis *Leptochloa*
- 36'. Spikes few, digitate or nearly so 37
37. Rachis of spike extending beyond the spike *Dactyloctenium*
- 37'. Rachis not prolonged *Eleusine*
38. Spikelets without additional modified florets, the rachilla sometimes prolonged 39
- 38'. Spikelets with 1 or more modified florets above the perfect one 40
39. Rachilla disarticulating above the glumes *Spartina*
- 39'. Rachilla disarticulating above the glumes *Cynodon*
40. Spikelets with 2 sterile florets below the perfect one; second glume bearing a squarrose spine on the back *Ctenium*
- 40'. Spikelets with no sterile florets below the perfect one; second glume without a squarrose spine 41
41. Spikes digitate *Chloris*

- 41'. Spikelets racemose 42
42. Spikelets distant, appressed, spikes slender, elongate . . . *Gymnopogon*
- 42'. Spikelets approximate or crowded, not appressed;
spikes usually short and stout *Bouteloua*
43. Spikelets 1-flowered 44
- 43'. Spikelets 2- to many-flowered 59
44. Articulation below the glumes, spikelets falling entire . . . 45
- 44'. Articulation above the glumes 47
45. Glumes long-awned *Polypogon*
- 45'. Glumes awnless 46
46. Rachilla not prolonged behind the palea; panicle dense . . . *Alopecurus*
- 46'. Rachilla prolonged behind the palea; panicle open *Cinna*
47. Fruit dorsally compressed, indurate, smooth,
shining, awnless *Milium*
- 47'. Fruit laterally compressed or terete, awned or awnless . . . 48
48. Fruit indurate, terete, awned; callus well developed,
oblique, bearded 49
- 48'. Fruit thin or firm but not indurate; callus not well
developed 51
49. Awn trifid *Aristida*
- 49'. Awn simple 50
50. Awn persistent, bent and twisted, several to many
times longer than the fruit; callus sharp-pointed,
usually narrow and acuminate *Stipa*
- 50'. Awn deciduous, not twisted, sometimes bent, rarely
more than 3 or 4 times as long as the plump fruit
callus short, usually obtuse *Oryzopsis*
51. Glumes longer than the lemma 52
- 51'. Glumes not longer than the lemma, usually shorter 54
52. Glumes compressed-carinate, stiff-ciliate on the keel;
panicle dense, cylindric or ellipsoid *Phleum*
- 52'. Glumes not compressed-carinate, not ciliate 53
53. Florets bearing a tuft of hairs at the base from the short
callus; palea well developed, the rachilla prolonged
behind the palea as a hairy bristle *Calmagrostis*

- 53'. Floret without hairs at the base or with short hairs;
palea usually small or obsolete *Agrostis*
54. Lemma awned from the tip or mucronate, 3- to 5-nerved . . 55
- 54'. Lemma awnless or awned from the back 56
55. Rachilla prolonged behind the palea; florets stipitate . . . *Brachelytrum*
- 55'. Rachilla not prolonged; floret not stipitate *Muhlenbergia*
56. Floret bearing a tuft of hairs at the base of the short callus . 57
- 56'. Floret without hairs at base 58
57. Panicle spike-like; rachilla prolonged *Ammophila*
- 57'. Panicle open; rachilla not prolonged *Calamovilfa*
58. Caryopsis at maturity falling from the lemma and
palea; seed loose in the pericarp *Sporobolus*
- 58'. Caryopsis not falling from the lemma and palea;
seed adnate to the pericarp *Muhlenbergia*
59. Glumes shorter than lowermost floret; awn, if present,
straight or arising from or near the apex of the lemma . . . 60
- 59'. Glumes as long as lowermost floret; awn, if present, not
straight or arising from or near the apex of the lemma . . . 80
60. Tall stout reeds with large plume-like panicles 61
- 60'. Low or rather tall grasses, rarely more than 1.5 m tall . . . 62
61. Leaves crowded at base of culms *Cortaderia*
- 61'. Leaves distributed along culms 63
62. Lemmas naked, rachilla naked *Phragmites*
- 62'. Lemmas hairy, rachilla naked *Arundo*
63. Plants dioecious, perennial; spikelets in narrow,
simple exserted panicles *Distichlis*
- 63'. Plants not dioecious 64
64. Spikelets of two forms, sterile and fertile intermixed;
panicle dense, spikelike *Cynosurus*
- 64'. Spikelets all alike in the same inflorescence 65
65. Lemmas 3-nerved, nerves prominent 66
- 65'. Lemmas 5- to many-nerved, nerves sometimes obscure . . 69
66. Lemmas pubescent on nerves or callus, midnerve
usually exserted as awn or mucro 67

- 66'. Lemmas not pubescent on nerves or callus, awnless 68
67. Palea densely long ciliate on upper half *Triplasis*
 67'. Palea sometimes villose but not long-ciliate on upper half . *Tridens*
68. Lemmas chartaceous; grain large, beaked at maturity
 forcing lemma and palea open *Diarrhena*
 68'. Lemmas membranaceous; if firm, neither large
 nor beaked *Eragrostis*
69. Spikelets with 1 to 4 empty lemmas below the fertile
 florets, nerves obscure, lemmas firm *Uniola*
 69'. Spikelets with no empty lemmas below the fertile florets,
 nerves usually prominent, lemmas membranaceous 70
70. Lemmas as broad as long, margins outspread, florets
 horizontally spreading *Briza*
 70'. Lemmas longer than broad, margins clasping palea,
 florets not horizontally spreading 71
71. Callus of florets bearded; lemmas bifid at summit,
 awned *Schizachne*
 71'. Callus not bearded; lemmas not erose
 (slightly in *Puccinellia*) 72
72. Lemmas keeled on the back 73
 72'. Lemmas rounded on the back 75
73. Spikelets strongly compressed, crowded in 1-sided clusters
 at the ends of the stiff, naked panicle branches *Dactylis*
 73'. Spikelets not strongly compressed, not crowded in
 1-sided clusters 74
74. Lemmas awned from a minutely bifid apex, spikelets large *Bromus*
 74'. Lemmas awnless, spikelets small *Poa*
75. Glumes papery; upper florets sterile *Melica*
 75'. Glumes not papery; upper florets like the others 76
76. Nerves of lemma parallel, not or slightly converging
 at the summit 77
 76'. Nerves of lemma converging toward the summit 78
77. Nerves prominent; plant usually rather tall, growing
 in woods or fresh-water marshes *Glyceria*
 77'. Nerves faint; plants low, growing in saline soil *Puccinellia*

78. Lemmas awned or awn-tipped from a minutely bifid apex . *Bromus*
 78'. Lemmas entire, pointed, awnless or awned from the tip . . . 80
79. Spikelets awned (awnless in a few perennial species);
 lemmas jointed *Festuca*
 79'. Spikelets awnless *Poa*
80. Florets 2, one perfect, one staminate 81
 80'. Florets 2 or more, all alike except the upper reduced ones . 82
81. Upper floret perfect, awnless; lower floret awned *Arrhenatherum*
 81'. Lower floret perfect, awnless; upper floret awned *Holcus*
82. Articulation below the glumes, the spikelets falling entire . *Sphenopholis*
 82'. Articulation above the glumes 83
83. Lemmas bifid at apex, awned or mucronate between
 the lobes; spikelets several-flowered *Danthonia*
 83'. Lemmas toothed, but not bifid and awned or mucronate
 between the lobes 84
84. Glumes 2 to 3.5 cm long, 7- to 9-nerved; spikelets 2-flowered
 or with a rudimentary third floret, pendulous *Avena*
 84'. Glumes not more than 1 cm. long, 1- to 5-nerved; spikelets
 not pendulous 85
85. Rachilla prolonged behind upper floret; lemmas truncate
 and erose-dentate at summit *Deschampsia*
 85'. Rachilla not prolonged, lemmas tapering into
 2 slender teeth *Aira*
86. Spikelets solitary at each node of rachis 87
 86'. Spikelets more than one at each node of rachis 90
87. Spikelets sunken in rachis, 1-flowered *Parapholis*
 87'. Spikelets not sunken in rachis, 2- to several-flowered 88
88. Spikelets placed edgewise to rachis *Lolium*
 88'. Spikelets placed flatwise to rachis 89
89. Plants annual *Aegilops*
 89'. Plants perennial *Agropyron*
90. Spikelets three at each node, 1-flowered, the latter
 pair pediceled and usually reduced to awns *Hordeum*
 90'. Spikelets two or more, sometimes solitary, at each node
 of rachis, 2- to 6-flowered 91

91. Glumes wanting or reduced to two short bristles;
 spikelets horizontally spreading or ascending *Hystrix*
- 91'. Glumes usually equalling florets; spikelets appressed
 or ascending *Elymus*

SPECIES DESCRIPTIONS

Aegilops L. Goatgrass

Annual; blades flat; culms unbranched; spikes terminal; spikelets 2- to 5-flowered, solitary, turgid or cylindric, placed flatwise at each joint of rachis; joints thickened at summit; spike usually disarticulating near base at maturity, falling entire or disarticulating between spikelets.

Aegilops cylindrica Host. Jointed goatgrass.

Culms erect, branching at base, 40-60 cm tall; blades 2-3 mm wide; spike cylindric, 5-10 cm long; internodes of rachis 6-8 mm long; spikelets 8-10 mm long, glabrous to hispid; glume, several-nerved, keeled at 1 side, the keel extending into an awn, the main nerve of the other side extending into a short tooth; lemmas mucronate, those of the uppermost spikelet, awned like the glume; awns very scabrous, those of the upper spikelets about 5 cm long, those of the lower spikelets progressively shorter. Weed in wheatfields and waste places in Buckingham, Campbell, Clarke, Giles, Montgomery, Nelson, Page, Pulaski, Rockingham, Russell and Tazewell Counties. Hitchcock noted that *A. ovata* L. is a weed in California and Virginia. The spike disarticulates in *A. cylindrica* but not in *A. ovata*.

Agropyron Gaertn. Wheatgrass

Perennial; culms unbranched and usually erect; spikes terminal; spikelets several-flowered, solitary, in alternate notches of zigzag rachis; glumes equal, shorter than first lemma, acute or awned; lemmas convex, acute or awned; palea about as long as lemma.

1. Leaves mostly 6-10 mm wide; creeping rhizomes present *A. repens*
- 1'. Leaves mostly 2-4 mm wide; rhizomes absent *A. trachycaulum*

Agropyron repens (L.) Beauv. Quackgrass. Couchgrass. Couch. Twitch.
 Witchgrass.

Green or glaucous; culms erect or curved at base, 50-100 cm tall, sometimes taller, with creeping yellowish rhizomes; sheaths of the innovations often pubescent; blades relatively thin, flat, usually sparsely pilose on upper surface, mostly 6-10 mm wide; spike 5-15 cm long, the rachis scabrous in the angles; spikelets mostly 4- to 6-flowered, 1-1.5 cm long, the rachilla glabrous or puberulous; glumes 3- to 7-nerved, awnpointed; lemmas mostly 8-10 mm long, the awn from less than 1 mm to as long as the lemma; palea obtuse, nearly as long as the lemma, scabrous on the keels. Obnoxious weed of waste places, meadows and pastures; common in mountains and Piedmont. Introduced from Eurasia.

Agropyron trachycaulum (Link) Malte. Slender wheatgrass. Awned wheatgrass.

Green or glaucous, without creeping rhizomes; culms erect, tufted, 50-100 cm tall; sheaths glabrous or rarely pubescent; blades mostly 2-4 mm wide; spike slender, 10-25 cm long, sometimes unilateral; spikelets from rather remote to closely imbricate; glumes and lemmas awnless or nearly so. Mountains of Alleghany, Augusta, Bath, Botetourt, Highland, Rockbridge, Rockingham and Smyth Counties. A northern species reaching its southern limit in our area, common in

the far west where it is cultivated extensively. It is one of the few native grasses of North America in cultivation.

Agrostis L. Bentgrass

Annual or usually perennial; culms ascending, erect or decumbent; spikes terminal; spikelets one-flowered, disarticulating above glumes; glumes equal or nearly so, acute, acuminate or awn-pointed, usually scabrous on keel; lemma obtuse, usually shorter than glumes, awnless or dorsally awned; palea usually shorter than lemma, may be obsolete.

1. Palea 2-nerved 2
- 1'. Palea obsolete or a minute nerveless scale 6
2. Glumes scabrous on keel and back; panicle contracted, lobed, the short branches densely verticillate *A. semiverticillata*
- 2'. Glumes scabrous on keel only; panicle open, or if contracted, not lobed nor with densely verticillate branches 3
3. Branches of panicle naked at base; ligule up to 2 mm long on culm *A. tenuis*
- 3'. Branches of panicle or some of them floriferous from base; ligule up to 6 mm long 4
4. Panicle contracted, branches appressed; long stolons . . . *A. palustris*
- 4'. Panicle open, branches ascending; no long stolons 5
5. Culms decumbent at base; rhizomes wanting *A. stolonifera*
- 5'. Culms erect; rhizomes developed *A. alba*
6. Plants annual, lemma with a slender flexuous, delicate awn *A. elliotiana*
- 6'. Plants perennial; lemmas awned or awnless, when present not much exerted 7
7. Panicle very diffuse, the capillary branches branching above the middle or toward the end 8
- 7'. Panicle open but not diffuse, the branching occurring at or below the middle 9
8. Spikelets 1.5-1.7 mm long, very densely clustered at ends of branchlets; lemma 1-1.2 mm long, scarcely longer than caryopsis *A. hiemalis*
- 8'. Spikelets 2-2.7 mm long, loosely arranged at the ends of branchlets; lemmas 1.5-1.7 mm long, distinctly longer than caryopsis *A. scabra*
9. Lemma awnless 10
- 9'. Lemma awned *A. borealis*
10. Spikelets mostly 2.2-2.7 mm long, not aggregate or but slightly so at ends of panicle branches *A. perennans*
- 10'. Spikelets mostly 2.7-3.5 mm long, aggregate towards ends of panicle branches *A. altissima*

Agrostis semiverticillata (Forsk.) C. Christ. Water bent.

Culms usually decumbent at base, sometimes with long creeping and rooting stolons; blades firm, mostly relatively short and broad, but in luxuriant specimens elongate; panicle contracted, 3-10 cm long, densely flowered, lobed, with short verticillate branches, especially at the base, the branches spikelet-bearing from the base; spikelets usually falling entire; glumes equal, narrowed to an obtuse tip,

scabrous on back and keel, 2 mm long; lemma 1 mm long, awnless, truncate and toothed at apex; palea nearly as long as lemma. Moist ground at seaports from ballast, City of Newport News. Introduced.

Agrostis tenuis Sibth. (= *A. capillaris* L.). Colonial bent. Browntop. Rhode Island bentgrass.

Culms slender, erect, tufted, usually 20-40 cm tall, with short stolons but no creeping rhizomes; ligule short, less than 1 mm or on the culm as much as 2 mm long; blades mostly 5-10 cm long, 1-3 mm wide; panicle mostly 5-10 cm long, open, delicate, the slender branches naked below, the spikelets not crowded. Cultivated for pastures and lawns; escaped and well established in Coastal Plain, Fall Belt, Blue Ridge and western mountains. May not be native.

Agrostis palustris Huds. Creeping bent.

Differing from *A. stolonifera* chiefly in the long stolons, the narrow stiff appressed blades, and the condensed (sometimes somewhat open) panicle. Marshes along the coast in Accomack, York, Surry Counties and City of Suffolk.

Agrostis stolonifera L. Creeping bent. Red top.

Culms ascending from a spreading base, the decumbent portion rooting in wet soil, 20-50 cm tall; ligule as much as 6 mm long; blades flat, mostly 1-3 mm wide; panicle oblong, 5-15 cm long, pale or purplish, somewhat open, the branches or some of them spikelet-bearing from near the base; spikelets 2-2.5 mm long; glumes acute, glabrous except the scabrous keel; lemma shorter than the glumes, awnless or rarely awned from the back; palea usually half to two-thirds as long as the lemma. Moist grassy places throughout the state.

Agrostis alba L. Redtop. Bentgrass.

Differing from *A. stolonifera* in its usually erect more robust culms, sometimes as much as 1-1.5 m tall, the base erect or decumbent, with strong creeping rhizomes; blades flat, 5-10 mm wide; panicle pyramidal-oblong, reddish, as much as 20 cm long, the branches spreading in anthesis, sometimes contracting later; lemmas rarely awned. The common redtop cultivated for meadows, pastures and lawns, extensively escaped throughout the state. Apparently not native in America.

Agrostis elliotiana Schult. No common name known.

Annual; culms slender, erect or decumbent at base, 10-40 cm tall; blades flat, about 1 mm wide; panicle finally diffuse, about half the entire height of the plant, the branches capillary, fascicled, the spikelets toward the ends of the branchlets, the whole panicle breaking away at maturity; spikelets 1.5-2 mm long; glumes acute; lemma 1-1.5 mm long, minutely toothed, awned below the tip, the awn very slender, flexuous, delicately short-pilose, 5-10 mm long, sometimes falling at maturity; palea wanting. Fields, waste places and open ground of Fall Belt and Piedmont.

Agrostis hiemalis (Walt.) B.S.P. Spring hairgrass, Hairgrass. Fly-away grass. Winter bentgrass. Ticklegrass.

Culms mostly 30-40 cm tall, erect in small tufts, glabrous; blades crowded toward the base in a dense cluster, 3-5 cm long, less than 1 mm wide, flat or subfiliform; panicles fragile, the slender filiform branches in rather distant whorls, widely spreading or drooping, unbranched below the middle, spikelet-bearing only at the ends of the branchlets; spikelets 1.5-1.7 mm long, clustered, short-pedicel, appressed; glumes subequal, acute, scabrous on the keels; lemma 1-1.2 mm long,

the callus glabrous; anthers 0.2 mm long. Open ground, fields and waste places throughout the state.

Agrostis scabra Willd. Rough bentgrass. Hairgrass.

Culms 30-85 cm, rarely to 100 cm tall, erect in small dense tufts; sheaths shorter than the internodes, glabrous; ligule hyaline, 2-5 mm long; blades flat, 8-20 cm long, 1-3 mm wide, scabrous, the basal ones often subfiliform; panicles 15-25 cm long, rarely longer, the brittle scabrous branches in rather distant verticils, ascending or spreading, sometimes drooping, branching above the middle; spikelets 2-2.7 mm long, loosely arranged at the ends of the branchlets; glumes unequal, acuminate, scabrous on the keels; lemma 1.5-1.7 mm long, distinctly longer than the caryopsis, the callus sparsely pilose; anthers 0.4-0.5 mm long. Mountain meadows, fields and open woods. Probably introduced.

Agrostis borealis Hartm. Bentgrass.

Culms tufted, 20-40 cm tall, or, in alpine plants, dwarf; leaves mostly basal, the blades 5-10 cm long, 1-3 mm wide; panicle pyramidal, 5-15 cm long, the lower branches whorled and spreading; glumes 2.5-3 mm long, acute; lemma a little shorter than the glumes, awned, the awn usually bent and exserted; palea obsolete or nearly so. Rocky slopes and moist banks at high altitudes, White Top Mt., Grayson County.

Agrostis perennans (Walt.) Tuckerm. Autumn bent. Thin grass. Upland bent.

Culms erect to somewhat decumbent at base, varying from weak and lax to relatively stout, 30-100 cm tall, often with lax leafy shoots at base; leaves rather numerous, the blades from lax to stiffly upright, corresponding to the culms, 10-20 cm long, 1-6 mm wide; panicle pale to tawny, open, oblong, the branches verticillate, mostly lax, ascending, branching about the middle, spikelets 2-3.2, mostly 2.2-2.7 mm long, the pedicels spreading, but the spikelets sometimes somewhat aggregate toward the ends of the branchlets; glumes acute or acuminate; the first slightly longer; lemma 1.5-2 mm long, rarely awned; palea obsolete or nearly so. Open ground, old fields, open woods in rather dry soil throughout the state.

Agrostis altissima (Walt.) Tuckerm. No common name known.

Culms mostly stouter than in *A. perennans*, erect or ascending, panicle branches usually ascending, the spikelets more or less aggregate toward the ends; spikelets 2.3-3.7, mostly 2.7-3.5 mm long. Mostly in marshy ground, pine barren bogs, and wooded swamps of Coastal Plain.

Aira L. Hairgrass

Delicate annual with lax, subfiliform blades and open or contracted panicles; spikelets small, two-flowered; glumes boat-shaped, about equal; lemmas firm, rounded on back, tapering into two slender teeth, a slender geniculate, twisted awn usually exserted on back of lemma.

- 1. Panicle spike-like, dense *A. praecox*
- 1'. Panicle open 2
- 2. Lower floret with awn as long as that of the upper flower *A. caryophyllea*
- 2'. Lower floret awnless or nearly so *A. elegans*

Aira praecox L. No common name known.

Culms tufted, 10-20 cm tall, usually erect; panicle narrow, dense, 1-3 cm long; spikelets yellowish, shining, 3.5-4 mm long; lemmas with awns 2-4 mm long, that of

the lower floret the shorter. Sandy open ground along the coast, Tidewater and Eastern Shore.

Aira caryophyllea L. Silver hairgrass.

Culms solitary or in small tufts, erect, 10-30 cm tall; panicle open, the silvery shining spikelets 3 mm long, clustered toward the ends of the spreading capillary branches; both lemmas with awns about 4 mm long. Open dry ground, Coastal Plain and Piedmont.

Aira elegans Willd. ex Gaudin. (= *A. capillaris* Host.). No common name known.

Resembling *A. caryophyllea*; panicle more diffuse; spikelets 2.5 mm long, scattered at ends of branches; lemma of lower floret awnless or with a minute awn just below the apex, that of the upper floret with an awn 3 mm long. Open ground of Coastal Plain and Piedmont.

Alopecurus L. Foxtail

Annuals or perennials; branching culms, panicles densely flowered, spike-like panicles; spikelets one-flowered, glumes equal, awnless; palea wanting.

- | | | |
|-----|---|------------------------|
| 1. | Spikelets 5-6 mm long | 2 |
| 1' | Spikelets 2-4 mm long | 3 |
| 2. | Panicle slender, tapering at each end; glumes scabrous on keel; annual | <i>A. myosuroides</i> |
| 2'. | Panicle cylindric, dense; glumes conspicuously ciliate on keel; perennial | <i>A. pratensis</i> |
| 3. | Plants perennial, culms decumbent | <i>A. geniculatus</i> |
| 3'. | Plants annual, culms tufted | <i>A. carolinianus</i> |

Alopecurus myosuroides Huds. Foxtail.

Annual; culms tufted, slightly scabrous, 10-50 cm tall, erect or decumbent at base; blades usually 2-3 mm wide; panicle slender, somewhat tapering at each end, 4-10 cm long, 3-5 mm wide; glumes 6 mm long, pointed, whitish with 3 green nerves, glabrous, scabrous on keel, short-ciliate at base; lemma about as long as the glumes, the awn bent, exerted 5-8 mm. Fields, waste places and ballast ground of Arlington, Henrico, James City and Powhatan Counties. Introduced, rare, Eurasia.

Alopecurus pratensis L. Meadow foxtail.

Perennial; culms erect, 30-80 cm tall; blades 2-6 mm wide; panicle 3-7 cm long, 7-10 mm thick; glumes 5 mm long, villose on keel and pubescent on sides; awn exerted 2-5 mm. Fields and waste places, Arlington County. Introduced from Eurasia.

Alopecurus geniculatus L. Water foxtail.

Perennial; culms decumbent, rooting at the nodes, 15-60 cm tall; blades 1-4 mm wide; panicle slender, 2-7 cm long, about 4 mm thick; spikelets 2 mm long, awn of lemma exerted 2-3 mm, giving the panicle a softly bristly appearance; spikelets about 2.5 mm long, the tip dark purple; anthers about 1.5 mm long. In water and wet places, cities of Virginia Beach, and Chesapeake; Arlington, Fairfax and Montgomery Counties.

Alopecurus carolinianus Walt. Field foxtail.

Annual; culms tufted, much branched at base, 10-50 cm tall; similar to *A. geniculatus* but panicle more slender; spikelets 2-2.5 mm long, pale, awn exerted

2-3 mm; anthers about 0.5 mm long. Moist open ground, old fields and wet places of Coastal Plain.

Ammophila Host. Beachgrass

Tough, rather coarse, erect perennials with hard, scaly, creeping rhizomes; blades long, tough, involute; panicles pale, dense, spikelike; spikelets 1-flowered, compressed, rachis disarticulating above glumes, produced beyond palea as a short bristle, hairy above; glumes about equal, chartaceous; lemma similar to but a little shorter than glumes, callus bearded; palea nearly as long as lemma.

Ammophila breviligulata Fern. American beachgrass. Beachgrass. Psamma. Marram.

Culms in tufts, commonly 70-100 cm tall with deep strong extensively creeping rhizomes, the base of the culms clothed with numerous broad overlapping sheaths; ligule firm, 1-3 mm long; blades elongate, firm, soon involute, curved forward past the culm, the scaberulous upper surface curved downward; panicle pale, 15-30 cm long, nearly cylindrical spikelets 11-14 mm long; glumes scaberulous, the first 1-nerved, the second 3-nerved; lemma scabrous, the callus hairs about 2 mm long, the rachilla about 3 mm long. Sand dunes along the coast.

Amphicarpum Kunth

Annual or perennial erect grasses with flat blades and narrow terminal panicles. Spikelets of 2 kinds on the same plant, one perfect but not fruitful in a terminal panicle, the other cleistogamous on slender leafless subterranean branches from base of culm or sometimes from lower nodes; first glume of aerial spikelets variable in size, sometimes obsolete; second glume and sterile lemma about equal; lemma and palea indurate; fruiting spikelets much larger, first glume wanting; second glume and sterile lemma strongly nerved, subrigid, exceeded at maturity by the turgid, elliptic, acuminate fruit with strongly indurate lemma and palea.

Amphicarpum purshii Kunth. No common name known.

Annual; culms erect, 30-80 cm tall, the leaves crowded toward the base, hirsute; blades erect, 10-15 cm long, 5-15 mm wide, sharp-pointed; panicle 3-20 cm long; spikelets elliptic, 4-5 mm long; subterranean spikelets 7-8 mm long, plump, acuminate. Sandy pinelands of Eastern Shore.

Andropogon L. Beardgrass

Perennial; culms solid; spikelets in racemes, aggregate on a common peduncle which is usually enclosed by a spathe-like sheath, in pairs at each joint of rachis, one sessile and perfect, the other stalked and staminate or rudimentary; glumes nearly equal; sterile lemma shorter than glumes; fertile lemma usually bearing a bent and twisted awn from the apex or between the lobes; palea small or wanting.

1. Racemes solitary on each peduncle 2
- 1'. Racemes two to numerous on each peduncle 3
2. Culms erect; sessile spikelet 6-8 mm long; hairs on rachis and sterile pedicel inconspicuous *A. scoparius*
- 2'. Culms decumbent at base; sessile spikelets about 1 cm long; hairs on rachis and sterile pedicel rather prominent *A. littoralis*
3. Pedicillate spikelet staminate, similar to sessile spikelet but awnless *A. gerardii*
- 3'. Pedicillate spikelet reduced to 1 or 2 glumes, or obsolete, the pedicel only developed 4

4. Inflorescence very decompose, only profuse pairs of racemes aggregate in an elongate or corymbose mass . . . *A. glomeratus*
- 4'. Inflorescence not conspicuously decompose nor dense . . . 5
5. Peduncle not more than 1 cm long, the dilated spathes exceeding the 2 (occasionally 3 or 4) racemes 6
- 5'. Peduncles 2 cm long or more 7
6. Upper sheaths inflated, spathe-like, aggregate, the late inflorescence a flabellate tuft *A. elliottii*
- 6'. Upper sheaths not inflated and aggregate *A. virginicus*
7. Peduncles not more than 5 cm long, enclosed in the spathe or only slightly exerted *A. mohrii*
- 7'. Peduncles or most of them 5 to 15 cm long, mostly long-exserted 8
8. Upper sheaths inflated, overlapping, conspicuous *A. elliottii*
- 8'. Upper sheaths not inflated, overlapping nor conspicuous *A. ternarius*
- Andropogon scoparius* Michx. Little bluestem. Small bluestem. Broom beardgrass. Prairie beardgrass. Broom. Wiregrass.

Plants green or glaucous, often purplish, culms tufted, from slender to robust, compressed, 50-150 cm tall, erect, the upper half freely branching; sheaths and blades commonly glabrous or nearly so, frequently sparsely pilose at their junction, rarely pubescent to villose throughout, the blades 3-6 mm wide, flat; raceme 3-6 cm long, mostly wholly or partly included in the sheaths, commonly spreading, the rachis slender, flexuous, pilose, sometimes copiously so; sessile spikelet mostly 6-8 mm long, scabrous, the awn 8-15 mm long; pedicellate spikelet usually reduced, short-awned, spreading, the pedicel pilose. Open woods, dry hills and fields throughout the state.

Andropogon littoralis Nash. Dune bluestem.

Resembling *A. scoparius*, but culms more compressed, with broad, keeled, overlapping lower sheaths, often bluish-glaucous, the flat tufts crowded on a slender rhizome, decumbent or bent at base; blades 4-6 mm wide; rachis joints and pedicels copiously long-villose. Sandy shores, moist to wet soil along shores of Coastal Plain.

Andropogon gerardii Vitman. Big bluestem. Turkey foot. Turkey claw. Beardgrass.

Plants often glaucous; culms robust, often in large tufts, sometimes with short rhizomes, 1-2 m tall, usually sparingly branching toward the summit; lower sheaths and blades sometimes villose, occasionally densely so, the blades flat, elongate, mostly 5-10 mm wide, the margins very scabrous; racemes on the long-exserted terminal peduncle mostly 3 to 6, fewer on the branches, 5-10 cm long, usually purplish, sometimes yellowish; rachis straight, the joints and pedicels stiffly ciliate on one or both margins, the joints hispid at base; sessile spikelet 7-10 mm long, the first glume slightly sulcate, usually scabrous, the awn geniculate and tightly twisted below, 1-2 cm long; pedicellate spikelet not reduced, but slightly so, awnless, staminate. Dry soil, weedy fields and roadsides throughout the state.

Andropogon glomeratus (Walt.) B.S.P. Bushy beardgrass.

Culms erect, 50-150 cm tall, compressed, with broad keeled overlapping lower sheaths, the flat tufts often forming dense, usually glaucous, clumps, the culms

branching toward the summit; sheaths occasionally villose; blades elongate, 3-8 mm wide; inflorescence dense, feathery, from flabellate to oblong, the paired racemes 1-3 cm long, about equalling the slightly dilated spathes, the enclosed peduncle and ultimate branchlets long-villose, peduncle at least 5 mm long, often longer; rachis very slender, flexuous, long-villose; sessile spikelets 3-4 mm long, the awn straight, 1-1.5 cm long; sterile spikelet reduced to a subulate glume or wanting, the pedicel slender, long-villose. Low moist ground, marshes and swamps, scattered throughout the state; however, mostly in Piedmont and Coastal Plain.

Andropogon elliotii Chapm. Elliott beardgrass.

Culms tufted, erect, 30-80 cm tall, at first nearly simple, later branching toward the summit; lower sheaths keeled, rather narrow, commonly loosely pilose, those near the summit inflated and spathe-like, crowded, the very short internodes densely bearded, blades flat, 3-4 mm wide; primary inflorescence of few to several racemes, mostly in pairs, rarely threes or fours, one filiform, often strongly flexuous peduncles, long-exserted from inconspicuous spathes, these on slender branchlets, borne in the axils of broad, spathe-like sheaths of the main culm; secondary inflorescences on short peduncles from broad spathes; racemes flexuous, 3-4 cm long, rachis joints and pedicels long-villose; sessile spikelet 4-5 mm long, the awn somewhat twisted, 10-15 mm long; pedicellate spikelets obsolete or nearly so. Open ground, old fields and open woods scattered throughout the state.

Andropogon virginicus L. Broomsedge. Virginia broomsedge. Broomsedge bluestem.

Culms erect, 50-100 cm tall, usually in rather small tufts, the upper two-thirds mostly freely branching; lower sheaths compressed, keeled, equitant; sheaths glabrous or more or less pilose along the margins, occasionally conspicuously so; ligule strongly ciliate; blades folded or flat, 2-5 mm wide, pilose on upper surface toward base; inflorescence elongate, narrow, the 2 to 4 racemes 2-3 cm long, partly included and shorter than the inflated tawny to bronze spathes; rachis very slender, flexuous, long-villose; sessile spikelet about 3 mm long, the delicate straight awn 1-2 cm long; pedicel long-villose, its spikelet obsolete or nearly so. Open ground, old fields, open woods, sterile hills and sandy soil throughout the state.

Andropogon mohrii (Hack.) Hack. ex Vasey. No common name known.

Culms stout, compressed, tufted, erect, 80-130 cm tall, the upper half sparingly to rather freely branching; leaves villose, the lower sheaths strongly keeled and glabrous at base, the blades elongate, 3-5 mm wide; inflorescence narrow, the branches approximate, the ultimate branchlets short, densely bearded at summit, the purplish spathes 4-6 cm long; racemes mostly 4, tawny, 2-4 cm long, on peduncles mostly about 2 cm long, or the terminal ones sometimes long-exserted; rachis scarcely flexuous, the joints shorter than the spikelets, copiously long-villose; sessile spikelet 4-5 mm long, the awn loosely twisted below, 1.5-2 cm long; pedicel long-villose, the spikelet reduced to a minute glume. Wet pine woods of Prince George County.

Andropogon temarius Michx. Silverbeard. Split beard bluestem.

Culms tufted, erect, 80-120 cm tall, the upper half to two-thirds branching, the branches usually long, slender and erect; leaves often purplish-glaucous, glabrous, or the lower loosely villose, the blades 2-4 mm wide; inflorescence elongate, loose, of few to many pairs of silvery to creamy or grayish feathery racemes, usually on

long-exserted peduncles from slender inconspicuous spathes, some of the lateral peduncles often short, from dilated spathes, rarely most of them so; racemes 3-6 cm long, with mostly less than 12 joints, the rachis not flexuous, the joints shorter than the spikelets, copiously long-villose; sessile spikelets 5-7 mm long, glabrous and nerveless between the keels, the awn twisted below, 1.5-2 cm long; pedicel long-villose, the spikelet obsolete or nearly so. Dry sandy soil and open woods mostly in south central to eastern part of the state.

Anthoxanthum L. Vernalgrass

Sweet smelling annuals or perennials; panicles terminal; spikelets with one terminal perfect floret and two sterile lemmas; glumes unequal, acute or mucronate; sterile lemmas shorter than glumes, awned from back; fertile lemma awnless, shorter than sterile ones; palea rounded on back, enclosed in lemma.

- 1. Plants perennial *A. odoratum*
- 1'. Plants annual *A. aristatum*

Anthoxanthum odoratum L. Sweet vernalgrass.

Perennial; culms tufted, erect, slender, 30-60 cm tall, rarely to 1 m tall; blades 2-5 mm wide; panicle long-exserted, brownish-yellow, acute, 2-6 cm long; spikelets 8-10 mm long; glumes scabrous, the first about half as long as the second; sterile lemmas subequal, appressed-pilose with golden hairs, the first short-awned below the apex, the second awned from near the base, the awn twisted below, geniculate, slightly exceeding the second glume; fertile lemma about 2 mm long, brown, smooth and shining. Meadows, pastures and waste places throughout the state. Introduced from Eurasia.

Anthoxanthum aristatum Boiss. (= *A. puelli* Lecoq & Lamotte). No common name known.

Differing from *A. odoratum* in being annual, the culms lower, often geniculate and bushy branching; panicles looser; spikelets a little smaller. Waste places scattered throughout the state; Introduced from Europe.

Aristida L. Three-awn

Annual or perennial; slender tufted grasses; panicles narrow or some times open; spikelets 1-flowered; glumes equal or unequal, narrow, acute, acuminate or awn-tipped; lemma indurate, narrow, terete, convolute, with a hard, sharp-pointed callus terminating above in a usually trifold awn.

- 1. Lemma articulate with the column of the awns *A. tuberculosa*
- 1'. Lemma not articulate 2
- 2. Central awn spirally coiled at base, the lateral straight . . . 3
- 2'. Central awn not spirally coiled 4
- 3. Glumes nearly equal, 6 to 8 mm long; lemma 5 to 6 mm long *A. dichotoma*
- 3'. Glumes unequal, the second longer, about 1 cm long; lemma about 1 cm long *A. curtissii*
- 4. Plants annual 5
- 4'. Plants perennial 6
- 5. Awns mostly 4 to 7 cm long, about equal, divergent *A. oligantha*
- 5'. Awns mostly less than 2 cm long, often unequal *A. longespica*
- 6. Sheaths lanate-pubescent *A. lanosa*
- 6'. Sheaths not lanate-pubescent 7

7. Awns at maturity about equally divergent, sometimes slightly twisted but not spirally contorted at base *A. purpurascens*
 7. Awns at maturity unequally divergent or spirally contorted at base *A. virgata*
Aristida tuberculosa Nutt. No common name known.

Annual; culms branching, 30-60 cm or even 1 m tall; blades involute, 2-4 mm wide when flat; panicle 10-20 cm tall, the branches stiffly ascending; glumes about equal, gradually narrowed into an awn, about 2.5 cm long, including the awn; lemma 11-13 mm long, glabrous except for the slightly scabrous summit, extending downward into a densely pubescent callus 3-4 mm long; column of awns twisted, 10-15 mm long, the upper 2 or 3 mm twisted but not united, above this forming a semicircular bend, the terminal straight part of the awns usually deflexed, 3-4 cm long. Open sandy woods of Eastern Shore.

Aristida dichotoma Michx. Triple-awn grass. Three-awn. Poverty grass.

Annual; culms branched at base, 20-40 cm tall; blades short, the lower mostly flat, scarcely 1 mm wide, the upper involute; panicles terminal and axillary, the terminal usually less than 10 cm long, the lateral small; glumes about equal, 6-8 mm long; lemma 5-6 mm long; central awn spirally coiled, horizontally bent, 3-6 mm long, the lateral awns erect, about 1 mm long. Dry open ground throughout the state.

Aristida curtissii (A. Gray) Nash. No common name known.

Annual; similar to *A. dichotoma*, differing in the less branching habit, the longer and more conspicuous blades, the looser panicles of larger spikelets, the more unequal glumes, the longer second glume (about 1 cm long), the longer smooth lemma (about 1 cm long) and central awn, and the usually longer lateral awns; the central awn about 1 cm long, the lateral awns 2-4 mm long. Open dry ground scattered throughout the state.

Aristida oligantha Michx. Prairie three-awn. Whitegrass. Wiregrass. Need-legrass. Triple-awned grass.

Annual; much branched; culms 30-50 cm tall; blades flat or loosely involute, usually not more than 1 mm wide; panicle loose, 10-20 cm long; spikelets short-pedicceled, the lower often in pairs; glumes about equal, 2-3 cm long, tapering into an awn, the first 3-to 5-nerved; lemma about 2 cm long, the awns about equal, divergent, 4-7 cm long, somewhat spirally curved at base. Open dry ground throughout the state except for the southwest portion.

Aristida longespica Poir. No common name known.

Annual, branched; culms 20-40 cm tall; blades flat or involute, about 1 mm wide; panicles narrow, slender, the terminal 10-15 cm or even 20 cm long; glumes about equal, 5 mm long; lemma 4-5 mm long; central awn sharply curved at base, spreading, 5-15 mm long, the lateral awns erect, one-third to half as long as the central, sometimes only 1 mm long. Sterile or sandy soil scattered throughout the state.

Aristida lanosa Muhl. ex Ell. Woolly triple-awn grass.

Perennial; culms solitary or few in a tuft, rather robust, 1-1.5 m tall; sheaths lanate-pubescent or rarely glabrous; blades flat, elongate, as much as 4 mm wide; panicle narrow, rather loose, as much as 40 cm long; first glume 12-14 mm, the second about 10 mm; lemma 8-9 mm long; central awn horizontally spreading or

reflexed from a curved base, 1.5-3 cm long, the lateral half to two-thirds as long, erect or spreading. Dry sandy soil of the Coastal Plain and eastern Piedmont.

Aristida purpurascens Poir. Arrowfeather.

Perennial; culms tufted from a rather thin, weak, sometimes decumbent base, slender, 40-70 cm or even 1 m tall; blades flat, rather lax and flexuous (especially the old ones), usually less than 2 mm wide; panicle narrow, rather lax and nodding, one-third to half the entire length of the plant; glumes about equal, mostly 8-12 mm long; lemma about 7 mm long; awns about equal, divergent or somewhat reflexed, 1.5-2.5 cm long. Dry sandy soil mostly in central and eastern part of the state.

Aristida virgata Trin. No common name known.

Perennial; culms tufted from a rather slender soft base, erect, 50-80 cm tall; blades flat, rather lax, usually not more than 2 mm wide; panicle slender, erect, though not very stiff, rather loosely flowered, one-third to half the entire length of the culm; glumes about equal, 6-7 mm long; lemma 4-5 mm long; central awn horizontally spreading or somewhat reflexed, 1.5-2 cm long, the lateral awns erect, about two-thirds as long as the central. Moist sandy soil of the Coastal Plain. Harvill *et al.* list *A. virgata* as a synonym of *A. purpurascens*.

Arrhenatherum Beauv.

Rather tall perennial with flat blades and narrow panicles; spikelets 2-flowered, the lower floret staminate, the upper perfect, the rachilla disarticulating above the glumes and produced beyond the florets; glumes rather broad and papery, the first 1-nerved, the second 3-nerved; lemmas 5-nerved, hairy on the callus, the lower bearing near the base a twisted geniculate exerted awn, the upper with a short straight slender awn just below the tip.

Arrhenatherum elatius (L.) Presl. Tall oatgrass. Evergreen grass.

Culms erect, 1-1.5 m tall; blades flat, scabrous, 5-10 mm wide; panicle pale or purplish, shining, 15-30 cm long, the short branches verticillate, spreading in anthesis, usually spikelet-bearing from the base; spikelets 7-8 mm long; glumes minutely scabrous; lemmas scabrous, the awn of the staminate floret about twice as long as its lemma. Meadows, open ground, and waste places throughout the state.

Arthraxon Beauv.

Low creeping grass with broad cordate-clasping blades and subflabellate panicles; spikelets perfect, usually awned, sessile, the secondary spikelet and its pedicel wanting or the pedicel developed only at the lower joints of the filiform rachis; racemes terminating branches of a dichotomously forking panicle, in appearance subdigitate or fascicled.

Arthraxon hispidus (Thunb.) Makino. No common name known.

Annual; culms slender, branching, decumbent or creeping, 20-100 cm long; sheaths hispid; blades ovate to ovate lanceolate, 2-5 cm long, 5-15 mm wide, ciliate toward base; panicles of few to several racemes, flabellate, contracting toward maturity, on filiform peduncles; rachis joints glabrous; spikelets 4-5 mm long, the strong nerves aculeate-scabrous; sterile lemma with a slender geniculate awn. Pastures, lawns, and open ground throughout the state.

Arundinaria Michx. Cane.

Perennial woody plants; spikelets 8- to 12-flowered, large, compressed; glumes unequal, shorter than the lemmas; lemmas papery, rather fragile, acute, acuminate,

micronate or awn-tipped; palea about as long as the lemma, prominently 2-keeled and deeply sulcate between keels.

- 1. Primary branches erect or nearly so; individual culms with oblong-linear branches; spikelets usually rather loose . . . *A. gigantea*
- 1'. Primary branches ascending at 45° angle; individual culms with broadly lancolate branches; spikelets rather compact . *A. tecta*
Arundinaria gigantea (Walt.) Muhl. Giant cane. Large cane.

Culms 2-10 m high, branching; leaves 1.5-3 cm wide, tapering at each end; panicles on leafy branches bearing loose sheaths and small blades; spikelets 8- to 12-flowered, 3-7 cm long, on slender-angled pedicels 2-30 mm long, hirsute to nearly glabrous; glumes distant, acuminate, pubescent, the lower minute, sometimes wanting; lemmas broadly lanceolate, keeled, mostly 1.5-2 cm long, sometimes tapering into an awn 4 mm long, ciliate, appressed-hirsute to canescent; rachilla segments densely hirsute; palea scabrous on the keels. Forming extensive colonies in low woods, river banks, moist ground scattered throughout the state.

Arundinaria tecta (Walt.) Muhl. Switch cane. Small cane.

Similar to *A. gigantea*, the culms usually not more than 2 m tall, the sheaths more commonly as long as the internodes; blades on the average a little longer and narrower; inflorescence similar, spikelets 6- to 12-flowered, 3-5 cm long, relatively compact; glumes obtuse to acuminate, often glabrous or nearly so; lemmas scarcely keeled, glabrous or minutely canescent at the base; rachilla strigose. Forming colonies in swampy woods, moist pine barrens and live oak woods; sandy margins of streams of coastal plain and scattered in western part of state.

Arundo L.

Tall perennial reeds with broad linear blades and large plumelike terminal panicles, spikelets several-flowered, the florets successively smaller, the rachilla glabrous, disarticulating above glumes and between florets; glumes somewhat unequal, membranaceous, 3-nerved, narrow, tapering into a slender point; lemmas thin, 3-nerved, densely and softly long-pilose, two outer nerves ending in slender teeth, middle nerve extending into a straight awn.

Arundo donax L. Giant Reed.

Culms stout, in large clumps, 2-6 m tall, sparingly branching, from thick knotty rhizomes; blades numerous, elongate, 5-7 cm wide on the main culm, conspicuously distichous, spaced rather evenly along the culm, the margin scabrous; panicle dense, erect, 30-60 cm long; spikelets 12 mm long. Frequently cultivated for ornament in eastern part of state; also in Pulaski County along New River. Introduced from warm regions of Old World.

Avena L. Oats

Low or moderately tall annuals; panicles narrow or open, usually few-flowered with large, 2- to 3-flowered spikelets; glumes about equal, membranaceous or papery, longer than lower floret; lemmas indurate, except toward summit, bearing dorsal, bent and twisted awn.

- 1. Spikelets mostly 2-flowered; awn usually straight or wanting; lemmas glabrous *A. sativa*
- 1'. Spikelets mostly 3-flowered; awn stout, geniculate, twisted; lemmas with stiff brown hairs *A. fatua*

Avena sativa L. Oats.

Annual, culms rather stout, erect, up to 75 cm tall; leaves numerous and well developed; panicle loose, open, erect, the branches slender, spreading, or sometimes drooping; spikelets usually 2-flowered, about 2 cm long exclusive of awns, the florets not readily separating from the glumes; glumes about equal, many nerved, papery, overtopping the uppermost floret; lemmas glabrous; awn usually straight, often wanting. Commonly cultivated and occasionally escaped.

Avena fatua L. Wild Oats.

Culms 30-75 cm tall, erect, stout; leaves numerous, the blades flat, usually scabrous; panicle loose and open, the slender branches usually horizontally spreading; spikelets usually 3-flowered; glumes about 2.5 cm long; rachilla and lower part of the lemma clothed with long stiff brownish, or sometimes whitish, hairs, these sometimes scant; florets readily falling from the glumes; lemmas nerved above, about 2 cm long, the teeth acuminate, not setaceous; awn stout, geniculate, twisted below, 3-4 cm long. Cultivated soil and waste places of Montgomery County. Introduced from Europe.

Axonopus Beauv. Carpetgrass.

Stoloniferous or tufted perennial; culms compressed, tufted, erect, decumbent or stoloniferous; racemes slender, spikelike, digitate or racemose along main axis; spikelets depressed-biconvex, oblong, solitary, sessile, alternate, in 2 rows on one side of a 3-angled rachis; first glume wanting; second glume and sterile lemma equal, lemma without palea; fertile lemma indurate, oblong-elliptic, and back turned from rachis; palea indurate.

1. Spikelets 4-5 mm long, glabrous; midnerve of glume and sterile lemma evident *A. furcatus*
- 1'. Spikelets 2-3 mm long, sparsely appressed-silky; midnerve of glume and sterile lemma suppressed *A. affinis*

Axonopus furcatus (Flugge) Hitchc. No common name known.

Plants stoloniferous; culms compressed, tufted, erect, or decumbent at base, 40-100 cm tall; blades flat, mostly 5-10 mm wide, glabrous, ciliate, or even hirsute; racemes 2, digitate, rarely a third below, spreading, 50-100 cm long; spikelets 4-5 mm long (rarely less), glabrous, acute; glume and sterile lemma 5-nerved; fruit two-thirds as long as the spikelet. Marshes, river banks and moist pine barrens of Coastal Plain.

Axonopus affinis Chase. Carpetgrass. Common carpetgrass.

Tufted or stoloniferous; culms slender, glabrous, 25-35 cm tall, rarely as much as 75 cm, sometimes forming dense mats; sheaths compressed, keeled; blades as much as 28 cm long, usually less than 15 cm, 2-6 mm wide, flat or folded; racemes 2 to 4, 2-10 cm long, ascending; spikelets 2 mm long, oblong-elliptic, subacute, the second glume and sterile lemma covering the fruit or slightly pointed beyond it, sparsely silky-pilose. Moist, mucky or sandy meadows, open woods and waste places of Fairfax County and Virginia Beach.

Bouteloua Lag. Grama.

Perennial or sometimes annual, low or rather tall grasses with 2 to several or many spikes racemose on a common axis; spikelets 1-flowered, with the rudiments of 1 or more florets above, sessile, in 2 rows along one side of rachis; glumes 1-nerved, acuminate or awntipped, the first shorter and narrower; lemma as long as second glume or a little longer, 3-nerved, the nerves extending into short awns or mucros; palea sometimes 2-awned; a second rudimentary floret sometimes present.

Bouteloua curtipendula (Michx.) Torr. Side-oats grama. Grama grass. Tall grama grass. Mesquite grass.

Perennial, with scaly rhizomes; culms erect, tufted, 50-80 cm tall; blades flat or subinvolute, 3-4 mm wide, scabrous; spikes 35 to 50, 1-2 cm long, purplish, spreading or pendulous and mostly twisted to one side of the slender axis, this 15-25 cm long; spikelets 5 to 8, appressed or ascending, 6-10 mm long; fertile lemma acute, mucronate; rudiment with 3 awns and subacute intermediate lobes, often reduced and inconspicuous. Dry fields, shale barrens of Valleys and Ridges. Core et al. call it a handsome species.

Brachiaria (Trin.) Griseb.

Branching and spreading annuals or perennials, with linear blades and several spreading or appressed racemes approximate along a common axis; spikelets solitary, rarely in pairs, subsessile, in 2 rows on one side of a 3-angled, sometimes narrowly winged rachis; first glume turned toward rachis, short to nearly as long as spikelet; second glume and sterile lemma about equal, 5- to 7-nerved, lemma enclosing a hyaline palea and sometimes a staminate flower; fertile lemma indurate, usually papillose-rugose, the margins inrolled, apex rarely mucronate or with a short awn.

Brachiaria platyphylla (Griseb.) Nash. Broadleaf signalgrass.

Annual; culms decumbent, rooting at the lower nodes; blades rather thick, 4-12 cm long, 6-12 mm wide; panicle short-exserted or included at the base; racemes 2 to 6, distant, 3-8 cm long, ascending or spreading, the rachis winged, 2 mm wide; spikelets oval, 4-4.5 mm long, about 2 mm wide; first glume scarcely one-third the length of the spikelet, blunt; second glume and sterile lemma equal, exceeding the first and forming a flat beak beyond it, 3- to 5-nerved, with transverse veinlets toward the summit; fruit 3 mm long, elliptic, papillose-roughened. Low sandy open ground of Coastal Plain.

Brachyelytrum Beauv.

Erect, slender perennials with short, slender knotty rhizomes, flat blades and narrow, rather few-flowered panicles; spikelets 1-flowered, rachilla disarticulating above glumes, prolonged behind palea as a slender naked bristle; glumes minute, the first often obsolete, the second sometimes awned; lemma firm, narrow, 5-nerved, base extending into a pronounced oblique callus, the apex terminating in a long straight scabrous awn.

Brachyelytrum erectum (Schreb.) Beauv. Long-awned wood grass.

Culms 60-100 cm tall; sheaths sparsely retrorse-hispid, rarely glabrous; blades mostly 7-15 cm long, 1-1.5 cm wide, scabrous, sparingly pilose beneath, at least on the nerves and margin; panicle 5-15 cm long, the short branches appressed; second

glume 0.5-2 mm long; lemma subterete, about 1 cm long, scabrous, the nerves sometimes hispid, the awn 1-3 cm long. Moist or rocky woods throughout the state.

Briza L. Quaking grass.

Low annuals or perennials with erect culms, flat blades and usually open, showy panicles with capillary pedicels; spikelets several-flowered, broad, often cordate, florets crowded and spreading horizontally, rachilla disarticulating above glumes and between florets; glumes about equal, broad, papery-chartaceous with scarious margins; lemmas papery, broad with scarious spreading margins, cordate at base, several-nerved, nerves often obscure, apex obtuse or acutish; palea much shorter than lemma.

Briza minor L. Little quaking grass. Small quaking grass.

Annual; culms erect, 10-40 cm tall; ligule of the upper leaf 5 mm long or more, acute; blades 2-10 mm wide; panicle 5-12 cm long, the branches stiffly ascending; the spikelets pendent, triangular-ovate, 3- to 6-flowered, about 3 mm long. Infrequent in the state. Introduced from Europe.

Bromus L. Bromegrass

Native perennials and introduced annuals; culms low or rather tall with closed sheaths, usually flat blades; open or contracted panicles of large spikelets; spikelets several- to many-flowered, rachilla disarticulating above glumes and between florets; glumes unequal, acute; lemmas convex on back or keeled, 2-toothed, awned from between the teeth or awnless; palea usually shorter than lemma, ciliate on keel.

- 1. Spikelets strongly flattened, lemma compressed-keeled . . . *B. catharticus*
- 1'. Spikelets terete before anthesis or somewhat flattened; lemmas not compressed-keeled 2
- 2. Plants perennial 3
- 2'. Plants annual 8
- 3. Creeping rhizomes present *B. inermis*
- 3'. Creeping rhizomes wanting 4
- 4. Lemmas pubescent along margin and lower part of back, upper part glabrous *B. ciliatus*
- 4'. Lemmas pubescent rather evenly over the back, usually more densely so along the lower part of the margin 5
- 5. Panicle branches lax or drooping; blades along culm mostly elongate *B. kalmii*
- 5'. Panicle larger, usually erect, branches more or less drooping; blades mostly wide and lax 6
- 6. Sheaths shorter than internodes, nodes 4 to 6 *B. purgans*
- 6'. Sheaths as long or longer than internodes, nodes 6 to 20 7
- 7. Second glume 5-nerved; nodes 6 to 8; sheaths flangeless at mouth *B. nottawayanus*
- 7'. Second glume 3-nerved; nodes 10 to 20; sheaths with prominent flanges at mouth *B. latiglumis*
- 8. Lemmas broad, rounded above, not acuminate, teeth mostly less than 1 mm long 9
- 8'. Lemmas narrow, with a sharp callus, gradually acuminate, bifid, teeth 2-5 mm long 15

9. Panicle contracted, rather dense; branches erect
or ascending 10
- 9'. Panicle open; branches spreading 12
10. Lemmas glabrous *B. racemosus*
- 10'. Lemmas pubescent 11
11. Spikelets compressed; lemmas thin and narrow with
finally divaricate awn *B. scoparius*
- 11'. Spikelets turgid; lemmas rather thick, broad *B. mollis*
12. Foliage glabrous *B. secalinus*
- 12'. Foliage pubescent 13
13. Branches of panicle rather stiffly spreading or drooping,
not flexuous, awn straight *B. commutatus*
- 13'. Branches lax or flexuous, usually slender 14
14. Palea distinctly shorter than its lemma; awn flexuous,
usually somewhat divergent in drying; spikelets
rather turgid *B. japonicus*
- 14'. Palea about as long as its lemma; awn straight or
nearly so in drying; spikelets thinner and flatter,
scarcely turgid *B. arvensis*
15. Panicle contracted, erect; awn 16-22 mm long *B. madritensis*
- 15'. Panicle open, the branches spreading; awn 2-14 mm long 16
16. Second glume usually less than 1 cm long; pedicels capillary,
flexuous *B. tectorum*
- 16'. Second glume more than 1 cm long; pedicels somewhat
flexuous but not capillary 17
17. Awn about 2 cm long; first glume 8 mm long *B. sterilis*
- 17'. Awn 3-5 cm long; first glume about 15 mm long *B. rigidis*

Bromus catharticus Vahl. (= *B. unioloides* H.B.L.; = *B. willdenowii* Kunth. See Gould and Shaw, 1983). Rescue grass. Shrader's bromegrass. Smooth bromegrass. Awnless brome grass. Hungarian brome.

Annual or biennial; culms erect to spreading, as much as 100 cm tall; sheaths glabrous or pubescent; blades narrow, glabrous or sparsely pilose; panicle open, as much as 20 cm long, the branches as much as 15 cm long, naked at base, in small plants the panicles reduced to a raceme of a few appressed short-pedicelled spikelets; spikelets 2-3 cm long, 6- to 12-flowered; glumes acuminate, about 1 cm long; lemmas glabrous, scabrous, or sometimes pubescent, acuminate, 1.5 cm long, closely overlapping, concealing the short rachilla joints, awnless or with an awn 1-3 mm long, palea two-thirds as long as the lemma. Cultivated in the southern states as a winter forage grass. Escaped from cultivation. Scattered throughout the state. Introduced from South America.

Bromus inermis Leys. Smooth brome.

Culms erect, 50-100 cm tall, from creeping rhizomes; ligule 1.5-2 mm long; blades smooth or nearly so, 5-10 mm wide; panicle 10-20 cm long, erect, the branches whorled, spreading in flower, contracted at maturity; spikelets 2-2.5 mm long, subterete before flowering; first glume 4-5 mm long, the second 6-8 mm long; lemmas 9-12 mm long, glabrous or somewhat scabrous, rarely villose, obtuse, emarginate, mucronate, or with an awn 1-2 mm long. Cultivated as hay and pasture

grass; along roads and in waste places scattered throughout the state. Introduced from Europe.

Bromus ciliatus L. Fringed brome. Brome grass.

Culms slender, 70-120 cm tall, glabrous or pubescent at the nodes; sheaths glabrous or the lower short-pilose, mostly shorter than the internodes; blades rather lax, as much as 1 cm wide, sparsely pilose on both surfaces to glabrous; panicle 15-25 cm long, open, the branches slender, drooping, as much as 15 cm long; first glume 1-nerved, the second 3-nerved; lemmas 10-12 mm long, pubescent near the margin on the lower half to three-fourths, glabrous or nearly so on the back; awn 3-5 mm long. Moist woods and rocky slopes of Warren, Shenandoah, Montgomery, Wythe and Smyth Counties.

Bromus kalmii A. Gray. Wild chess.

Culms slender, 50-100 cm tall, usually pubescent at and a little below the nodes; sheaths usually shorter than the internodes, pilose or the upper glabrous; blades usually sparsely pilose on both surfaces, 5-10 mm wide; panicle rather few-flowered, drooping, mostly 5-10 cm long, the branches slender, flexuous, bearing usually 1-3 spikelets; first glume 3-nerved, second 5-nerved; lemmas 7-10 mm long, villose over the back, more densely so near the margins; awn 2-3 mm long. Dry or sandy ground and open woods of Augusta, Bath and Highland Counties.

Bromus purgans L. (= *B. pubescens* Muhl. in Willd.). Canada brome.

Resembling *B. ciliatus*; nodes mostly 4-6; sheaths, except the lower 1 or 2, shorter than the internodes, more or less retorsely pilose, or sometimes all glabrous; blades elongate, 5-17 mm wide, narrowed at base, and without flanges or auricles; pubescence of lemma nearly uniform, sometimes more dense on the margins, sometimes sparse and short on the back or scabrous only. Moist woods and rocky slopes throughout the state.

Bromus nottawayanus Fern. No common name known.

Resembling *B. latiglumis*, but with fewer nodes; sheaths mostly longer than the internodes, usually retorsely pilose, without flanges at the mouth; ligule very short; blades elongate, 6-13 mm wide; pilose above, some sparsely so beneath; panicles 12-22 cm long, the slender branches drooping, the pulvini inconspicuous; first glume 1- to 3-nerved, the second 5-nerved; lemma 8-13 mm long, densely appressed-pilose, the awn 5-8 mm long. Rich woods of Greensville and Sussex Counties.

Bromus latiglumis (Shear) Hitchc. No common name known.

Differing from *B. purgans* in having usually 10 to 20 nodes; sheaths overlapping, more or less pilose, especially about the throat and collar; base of blades with prominent flanges on each side, then usually prolonged into auricles. Where the ranges of *B. purgans* and *B. latiglumis* overlap, the latter flowers several weeks later than the former. Alluvial banks of streams of Fairfax, Giles, Shenandoah and Sussex Counties.

Bromus racemosus L. No common name known.

Differing from *B. mollis* in the somewhat more open panicle and glabrous and scabrous lemmas. Weed in waste places throughout the state. Introduced from Europe.

Bromus scoparius L. No common name known.

Culms 20-30 cm tall; sheaths soft-pubescent; blades glabrous, scabrous or sparingly pilose; panicle contracted, erect, 3-7 cm long; spikelets about 1.5 cm long, 3-4 mm wide; lemmas about 7 mm long, narrow, glabrous, awn 5-8 mm long, finally divaricate. Rare. Introduced from Europe on ballast at Newport News.

Bromus mollis L. Soft chess. Soft brome.

Softly pubescent throughout; culms erect, 20-80 cm tall; panicle erect, contracted, 5-10 cm long, or, in depauperate plants, reduced to a few spikelets; glumes broad, obtuse, coarsely pilose or scabrous-pubescent, the first 3- to 5-nerved, 4-6 mm long, the second 5- to 7-nerved, 7-8 mm long; lemmas broad, soft, obtuse, 7-nerved, coarsely pilose or scabrous, pubescent, rather deeply bidentate, 8-9 mm long, the margin and apex hyaline, awn rather stout, 6-9 mm long; palea about three-fourths as long as lemma. Weed in waste places and cultivated soil of Arlington, Fairfax, Montgomery and Prince George Counties. Introduced from Europe.

Bromus secalinus L. Cheatgrass. Rye brome. Chess. Cheat. Smooth chess.

Culms erect, 30-60 cm tall; foliage glabrous or the lower sheaths sometimes puberulent; panicle pyramidal, nodding, 7-12 cm long, the lower branches 3 to 5, unequal, slightly drooping; spikelets ovoid-lanceolate, becoming somewhat turgid at maturity, 1-2 cm long, 6-8 mm wide; glumes obtuse, the first 3- to 5-nerved, 4-6 mm long, the second 7-nerved, 6-7 mm long, elliptic, obtuse, smooth or scaberulous, the margin strongly involute at maturity, shortly bidentate at apex, the undulate awns usually 3-5 mm long, sometimes very short or obsolete; palea about as long as lemma. A weed in grainfields and waste places scattered throughout the state. Introduced from Europe.

Bromus commutatus Schrad. Hairy chess.

Resembling *B. secalinus*, but the sheaths retrorsely pilose; the blades more or less pubescent; lemmas at maturity less plump and more overlapping; awn commonly much longer. A weed in fields and waste places scattered throughout the state. Introduced from Europe.

Bromus japonicus Thunb. Japanese chess. Japanese brome.

Culms erect or geniculate at base, 40-70 cm tall; sheaths and blades pilose; panicle 12-20 cm long, broadly pyramidal, diffuse, somewhat drooping, the slender lower branches 3 to 5, all the branches more or less flexuous; glumes rather broad, the first acute, 3-nerved, 4-6 mm long, the second obtuse, 5-nerved, 6-8 mm long; lemmas broad, obtuse, smooth, 7-9 mm long, 9-nerved, the marginal pair of nerves faint, the hyaline margin obtusely angled above the middle, the apex blunt, emarginate; awn 8-10 mm long, usually somewhat twisted and flexuous at maturity, those of the lower florets shorter than the upper; palea 1.5-2 mm shorter than the lemma. Weed in waste places throughout the state. Introduced from the old world.

Bromus arvensis L. Field brome.

Resembling *B. japonicus*, foliage downy to subglabrous; spikelets thinner, flatter (less turgid), often tinged with purple; lemmas acute, bifid, awn straight or nearly so in drying; palea as long as the lemma or only slightly shorter. A weedy species on open ground, cultivated soil in Isle of Wight, Roanoke and Washington Counties.

Bromus madritensis L. Spanish brome. Compact brome. Madrid brome.

Culms 15-40 cm tall, smooth below the panicles; sheaths mostly smooth, blades puberulent to glabrous; panicle 5-10 cm long, oblong-ovoid (in dried specimens more or less fan shaped); lemmas longer than 16 mm, the teeth 2-3 mm long, awn rather stout, 16-22 mm long. Open ground and waste places, occasionally cultivated for ornament and escaping.

Bromus tectorum L. Downy brome. Drooping brome. Cheatgrass. Downy chess.

Culms erect or spreading, slender, 30-60 cm tall; sheaths and blades pubescent; panicle 5-15 cm long, rather dense, soft, drooping, often purple; spikelets nodding, 12-20 mm long; glumes villose, the first 4-6 mm long, the second, 8-10 mm long; lemmas lanceolate, villose or pilose, 10-12 mm long, the teeth 2-3 mm long, awn 12-14 mm long. Along roadsides, banks and waste places in infertile places, more frequent in the mountains.

Bromus sterilis L. Poverty brome. Barren brome. Sterile brome.

Resembling *B. rigidus*, less robust; culms 50-100 cm tall; sheaths pubescent; panicle 10-20 cm long, the branches drooping; spikelets 2.5-3.5 cm long, 6- to 10-flowered; glumes lanceolate-subulate, the first about 8 mm long; lemmas 17-20 mm long, scabrous or scabrous-pubercent, the teeth 2 mm long, awn 2-3 cm long. Fields and waste places infrequently throughout the state.

Bromus rigidus Rath. Ripgut grass. Ripgut brome.

Culms 40-70 cm tall; sheaths and blades pilose; panicle open, nodding, rather few-flowered, 7-15 cm long, the lower branches 1-2 cm long; spikelets usually 5- to 7-flowered, 3-4 cm long, excluding awns; glumes smooth, the first 1.5-2 cm long, the second 2.5-3 cm long; lemmas 2.5-3 cm long, scabrous or pubescent, the teeth 3-4 mm long, awn stout, 3.5-5 cm long. Open ground and waste places, infrequent in Virginia. Introduced from Mediterranean area.

Buchloe Engelm.

Low stoloniferous perennial with short curly blades; dioecious or monoecious; staminate flowers in 2 or 3 short spikes on slender erect culms, spikelets 2-flowered, sessile; pistillate flowers in sessile heads partly hidden among the leaves.

Buchloe dactyloides (Nutt.) Engelm. Buffalo grass

Plants grey green, the curly blades forming a dense sod 5-10 cm thick; blades rather sparsely pilose, 1-2 mm wide; staminate culms slender, 5-20 cm tall, the spikes 5-15 mm long; pistillate heads 3-4 mm thick. Grounds of Poplar Forest, Bedford County (Ramsey and Brooks, 1987).

Calamagrostis Adans. Reedgrass

Perennial; culms unbranched, tall with running root stocks; panicles many-flowered; spikelets 1-flowered; glumes nearly equal; lemma awned on the back, surrounded at base with many long hairs attached to callus; rachilla disarticulating above glumes, prolonged behind palea as a short, commonly hairy bristle.

1. Awn geniculate, protruding sidewise from glumes; callus hairs rather sparse, shorter than lemma *C. porteri*
- 1'. Awn straight, included; callus hairs usually not much shorter than lemma 2
2. Panicle rather loose and open *C. canadensis*
- 2'. Panicle more or less contracted *C. cinnoides*

Calamagrostis porteri A. Gray. No common name known.

Culms slender, 60-120 cm tall, with slender rhizomes; sheaths pubescent on the collar; blades flat, spreading, lax, 4-8 mm wide; panicle narrow but rather loose, erect or somewhat nodding, 10-15 cm long; glumes 4-6 mm long, scaberulous; lemma slightly shorter than the glumes, toothed at apex, the awn from near base, about as long as the lemma, bent and protruding from side of glumes; palea about as long as the lemma; callus hairs in tufts at the sides, rather scant, nearly half as long as the lemma; rachilla hairs scant, extending to about 3 mm. Dry rocky soils among stones and boulders in western part of the state.

Calamagrostis canadensis (Michx.) Beauv. Bluejoint grass. Bluejoint.

Culms suberect, tufted, 60-150 cm tall, with numerous creeping rhizomes; sheaths glabrous or rarely obscurely pubescent; blades numerous, elongate, flat, rather lax, scabrous, 4-8 mm wide; panicle nodding, from narrow and rather dense to loose and relatively open, especially at base, 10-25 cm long; glumes usually 3-4 mm long, smooth or more commonly scabrous, acute to acuminate; lemma nearly as long as the glumes, smooth, thin in texture, the awn delicate, straight, attached just below the middle and extending to or slightly beyond its tip, the callus hairs abundant, about as long as lemma; rachilla delicate, sparsely long-pilose. Marshes and wet places, open woods and meadows of western part of the state.

Calamagrostis cinnoides (Muhl.) Barton. No common name known.

Glaucous culms rather stout, erect, 80-150 cm tall, with slender rhizomes readily broken off; sheaths and blades very scabrous, sometimes sparsely hirsute, the blades flat, 5-10 mm wide; panicle erect, dense, more or less lobed (somewhat open at anthesis), 8-20 cm long, purple-tinged; glumes 6-7 mm long, scabrous, long-acuminate or awn-pointed; lemma firm, acuminate, scabrous, shorter than the glumes, the awn attached about one-fourth below the tip, not much exceeding the lemma, the callus hairs copious, about two-thirds as long; rachilla about 1 mm long, glabrous below, with a brush of long white hairs at the tip about equalling the lemma. Bogs and moist ground throughout the state.

Calamovilfa Hack.

Rigid, usually tall perennials with narrow or open panicles; spikelets 1-flowered, rachilla disarticulating above glumes, not prolonged behind palea; glumes unequal, chartaceous, 1-nerved, acute; lemma a little longer than second glume, chartaceous, 1-nerved, awnless, glabrous or pubescent; callus bearded; palea about as long as lemma.

Calmovilfa brevipilis (Torr.) Scribn. No common name known.

Culms solitary or few, compressed, 60-120 cm tall, the base a short thick horizontal rhizome; blades elongate, 2-3 mm wide, flat to subinvolute; panicle subpyramidal, rather open, 10-25 cm long, the branches ascending, flexuous, naked below; pedicels sparsely pilose at the summit; spikelets brownish, 5-6 mm long, the second about 4 mm long; lemmas villose on the back below, the callus hairs 1.5 mm long; palea exceeding the lemma, villose on the back. Marshes and riverbanks, sphagnum bogs, Brunswick and Greensville Counties.

Cenchrus L. Sandbur.

Annual or perennial; culms, commonly low and branching, may be up to 1 m high; racemes of 1-flowered spikelets, 1-6 together surrounded by ring of rigid spines fused together at base that drops off with them when fruit is ripe.

1. Body of bur ovate, usually not more than 3.5 mm wide,

- tapering at base; plants perennial *C. incertus*
- 1'. Body of bur globose, 5 mm or more wide, root not tapering at base; plants annual 2
2. Burs including spines, 7-8 mm wide, finely pubescent . . . *C. pauciflorus*
- 2'. Burs including spines, 10-15 mm wide, densely woolly . . . *C. tribuloides*

Cenchrus incertus M. A. Curtis. Field sandbur. Bургrass. Coast sandbur.

Perennial, glabrous as a whole; culms 25-100 cm tall; blades commonly folded but sometimes flat, 2-5 mm wide; raceme 4-10 cm long, the burs not crowded; burs about 3.5 (3-5) mm wide, the body finely and densely pubescent, the base glabrous; spines few, mostly less than 5 mm long, the lower often reduced or obsolete; spikelets 1 to 3 in each bur. Open sandy soil of Coastal Plain.

Cenchrus pauciflorus Benth. (= *C. longispinus* (Hack.) Fern.). Field sandbur. Longspine sandbur.

Annual, at times a short-lived perennial, sometimes forming large mats; culms spreading, 20-90 cm long, rather stout; blades usually flat, 2-7 mm wide; raceme usually 3-8 cm long, the burs somewhat crowded; burs (excluding spines) mostly 4-6 mm wide, pubescent, often densely so; spines numerous, spreading or reflexed, flat, broadened at base, the lowermost shorter and relatively slender, some of the upper ones commonly 4-5 mm long, usually villose at the base; spikelets usually 2 in each bur. Sandy open ground, often a weed in sandy fields scattered throughout the state.

Cenchrus tribuloides L. Dune sandbur.

Stouter than *C. pauciflorus*; soon branching and radiate-decumbent, rooting at the nodes; sheaths usually much overlapping; burs (excluding spines) 5-6 mm wide and 8-9 mm high, usually conspicuously villose. In loose sands of the Coastal Plain, also Rockbridge County.

Chloris Swartz. Fingergrass

Tufted plants with flat or folded scabrous blades and 2 to several, sometimes showy and feathery, spikes aggregate at the summit of culms; spikelets with 1 rudimentary floret and 1 perfect floret, sessile, in 2 rows along one side of a continuous rachis; glumes somewhat unequal, the first shorter, narrow, acute; lemma keeled, usually broad.

1. Rudiment truncate-broadened at apex, usually conspicuous *C. verticillata*
- 1'. Rudiment narrow, oblong, acute, often inconspicuous . . . 2
2. Plant producing long stout stolons; culms 1-1.5 m tall . . . *C. gayana*
- 2'. Culms straggling and rooting at nodes, 40-90 cm tall . . . *C. verticosa*

Chloris verticillata Nutt. Windmill grass.

Culms tufted, 10-40 cm tall, erect or decumbent at base, sometimes rooting at lower nodes; leaves crowded at base, 2 to 4, sometimes aggregate at lower nodes, sheath compressed, blades 1-3 mm wide, obtuse; spikes slender, 7-10 (-15) cm long, in 1 to 3 whorls, finally widely spreading; spikelets about 3 mm long; fertile lemma pubescent on nerves, awn mostly 5-8 mm long; rudiment (rarely fertile) cuneate-oblong, rather turgid, about 0.7 mm wide as folded, truncate, the awn about 5 mm long. Roanoke, Augusta and Frederick Counties, probably introduced from Plains States.

Chloris gayana Kunth. Rhodesgrass. Rhodes grass.

Culms 1-1.5 m tall with long, stout, leafy stolons, the internodes compressed, tough and wiry; blades 3-5 mm wide, tapering to a fine point; spikes several to numerous, erect or ascending, 5-10 cm long; spikelets crowded, pale-tawny; lemma 3 mm long, hispid on the margin near the summit, more or less hispidulous below, the awn 1-5 mm long; rudiment commonly of 2 florets, the lower occasionally fertile, rather narrow, the awn usually somewhat shorter than that of the fertile lemma, the upper minute, broad, truncate. Cultivated for forage, escaped into fields and waste places. Introduced from Africa.

Chloris ventricosa R. Br. No common name known.

Culms straggling and rooting at the nodes, 40-90 cm long; spikes 3 to 5, 7-10 cm long, flexuous, spreading or drooping; spikelets about 5 mm long; fertile lemma subindurate, brown, truncate, glabrous except for the pubescent callus, awn 4-5 mm long, that of the truncate rudiment 1-2 mm long. Occasionally cultivated, rare in the state. Introduced from Australia.

Cinna L. Woodreed

Tall perennials; panicles many-flowered, nodding; spikelets 1-flowered; glumes narrow, with short, stiff hairs on keel; lemma with short awn between the two small teeth at the tip; palea with only one keel; rachilla extending beyond palea into a tiny bristle.

1. Spikelets 5 mm long; panicle rather dense, branches ascending *C. arundinacea*
- 1'. Spikelets 3.5-4 mm long; panicle loose, branches spreading or drooping *C. latifolia*

Cinna arundinacea L. Woodreed grass. Stout woodreed.

Culms erect, usually 1-1.5 m tall, often somewhat bulbous at base, solitary or few in a tuft; sheaths glabrous, ligule rather prominent, thin; blades flat, scabrous, mostly less than 1 cm wide; panicle many-flowered, nodding, grayish, 15-30 cm long, the branches ascending; spikelets 5-6 mm long; glumes somewhat unequal, acute, the second 3-nerved; lemma usually a little longer than the first glume, bearing below the tip a minute straight awn; palea apparently 1-nerved. Moist woods and swampy areas throughout the state.

Cinna latifolia (Trevir.) Griseb. Drooping woodreed. Broadleaved woodreed.

Resembling *C. arundinacea*; blades shorter and on the average wider, as much as 1.5 cm wide; panicle green, looser, the branches fewer, spreading or drooping, naked at the base for as much as 5 cm; spikelets about 4 mm long; awn of lemma sometimes as much as 1 mm long (rarely wanting); palea 2-nerved, the nerves very close together. Moist woods of Highland, Grayson and Wythe Counties.

Cortaderia Stapf. Pampasgrass.

Large tussock grasses with leaves crowded at the base, blades elongate-attenuate, the margins usually serrulate; panicle large, plumelike, spikelets several-flowered; rachilla internodes jointed, the lower part glabrous, the upper part bearded forming a stipe to the floret; lemmas of pistillate spikelets clothed with long hairs.

Cortaderia selloana (Schult.). Aschers. and Graebn. Pampasgrass.

Dioecious perennial reed, in large bunches; culms stout, erect, 2 to 3 or more m tall; panicle feathery, silvery white to pink, 30-100 cm long; spikelets 2- to 3-flowered, the pistillate silky with long hairs, the staminate naked; glumes white,

papery, long, slender; lemmas bearing a long slender awn. Cultivated as a lawn ornamental in Coastal Plain and eastern Piedmont. Introduced from South America.

Ctenium Panzer

Erect, slender, rather tall perennials with usually solitary, often curved spikes, spikelets several-flowered but with only 1 perfect floret, sessile and pectinately arranged on one side of a continuous rachis, the rachilla disarticulating above the glumes; first glume small, hyaline, 1-nerved, the second about as long as the lemmas, firm, 3- to 4-nerved, bearing on the back a strong divergent awn; lemmas rather papery, 3-nerved, with long hairs on the lateral nerves and a short straight or curved awn on the back just below the apex, the first and second lemmas empty, the third enclosing a perfect flower, the upper 1 to 3 empty and successively smaller.

Ctenium aromaticum (Walt.) Wood. Toothache grass. Orange grass.

Culms 1-1.5 m tall, the old sheaths persistent and fibrillose at base; ligule about 1 mm long; blades flat or involute, stiff; spike 5-15 cm long; spikelets 5-7 mm long. Wet pine barrens of Coastal Plain.

Cynodon Rich.

Perennial, usually low grasses with creeping stolons or rhizomes, short blades, and several slender spikes digitate at summit of upright culms; spikelets 1-flowered, awnless, sessile in 2 rows along one side of a slender continuous rachis and appressed to it, rachilla disarticulating above glumes and prolonged behind palea as a slender naked bristle, sometimes bearing a rudimentary lemma; glumes narrow, acuminate, 1-nerved, about equal, shorter than florets; lemma firm, strongly compressed, pubescent on keel, 3-nerved, lateral nerves close to margins.

Cynodon dactylon (L.) Pers. Bermudagrass. Devilgrass. Wiregrass. Common bermudagrass. Scotch grass.

Extensively creeping by scaly rhizomes or by strong flat stolons, the old bladeless sheaths of the stolon and the lowest one of the branches often forming conspicuous pairs of "dog's teeth"; flowering culms flattened, usually erect or ascending, 10-40 cm tall; ligule a conspicuous ring of white hairs; blades flat, glabrous or pilose on the upper surface, those of the innovations often conspicuously distichous; spikes usually 4 or 5, 2.5-5 cm long; spikelets imbricate, 2 mm long, the lemma boat-shaped, acute. Open ground, grassland, fields and waste places scattered throughout the state.

Cynosurus L. Dogtail.

Annuals or perennials with narrow flat blades and dense spikelike or subcapitate panicles; spikelets of two kinds, sterile and fertile together, the fertile one sessile, nearly covered by the short-pedicel sterile one, these pairs imbricate in a dense 1-sided spikelike panicle; sterile spikelets consisting of 2 glumes and several narrow, acuminate, 1-nerved lemmas on a continuous rachilla; fertile spikelets 2- or 3-flowered, the glumes narrow, the lemmas broader, rounded on the back, awn-tipped, the rachilla disarticulating above the glumes.

1. Plants perennial; panicles narrow, spikelike; awns inconspicuous *C. cristatus*
 - 1'. Plants annual; panicles subcapitate; awns conspicuous . . . *C. echinatus*
- Cynosurus cristatus* L. Crested dogtail.

Perennial; culms tufted or geniculate at base, erect, 30-60 cm tall; panicle spike-like, linear, more or less curved, 3-8 cm long; pairs of spikelets about 5 mm long; lemmas with awns mostly not more than 1 mm long. Fields and waste places of the Coastal Plain. Introduced from Europe.

Cynosurus echinatus L. Rough dogtail.

Annual; culms 20-40 cm tall; blades short; panicle subcapitate, 1-4 cm long, bristly; pairs of spikelets 7-10 mm long; lemmas with awns 5-10 mm long. Open ground in Coastal Plain. Introduced from Europe.

Dactylis L. Orchard grass.

Perennials with flat blades and fascicled spikelets; spikelets few-flowered, compressed, finally disarticulating between florets, nearly sessile in dense, 1-sided fascicles, these borne at the ends of the few branches of a panicle; glumes unequal, carinate, acute, hispid-ciliate on the keel; lemmas compressed-keeled, mucronate, 5-nerved, ciliate on keel.

Dactylis glomerata L. Orchard grass. Cocksfoot.

Culms in large tussocks, 60-120 cm tall; blades elongate, 2-8 mm wide; panicles 5-20 cm long, the few distant stiff solitary branches ascending or spreading at anthesis, appressed at maturity, the lowermost sometimes as much as 10 cm long; lemmas about 8 mm long, mucronate or short-awned. Fields, meadows and waste places, commonly cultivated as a meadow and pasture grass throughout the state.

Dactyloctenium Willd.

Annuals or perennials with flat blades and 2 to several short thick spikes, digitate and widely spreading at the summit of the culms; spikelets 3- to 5-flowered, compressed, sessile and closely imbricate, in two rows along one side of the rather narrow flat rachis, the end projecting in a point beyond the spikelets; rachilla disarticulating above the first glume and between the florets; glumes somewhat unequal, broad, 1-nerved, the first persistent upon the rachis, the second mucronate or short-awned below the tip, deciduous; lemmas firm, broad, keeled, acuminate or short-awned, 3-nerved, the lateral nerves indistinct, the upper floret reduced; palea about as long as lemma.

Dactyloctenium aegyptium (L.) Beauv. Crowfoot grass.

Culms compressed, spreading with ascending ends, rooting at nodes, branching, commonly forming radiate mats, usually 20-40 cm long, sometimes as much as 1 m; blades flat, ciliate; spikes 1-5 cm long. Open ground, waste places and fields, Norfolk, Isle of Wight. Introduced from Old World Tropics.

Danthonia Lam. and DC. Oatgrass.

Tufted low or moderately tall perennials; panicles few-flowered, open or spike-like; spikelets large, 1- or 2-flowered, cleistogamous, in lower sheaths; glumes about equal, mostly exceeding uppermost floret; lemmas rounded on back, apex bifid, lobes acute, usually extending into slender awns, a stout geniculate awn arising from between the lobes.

- 1. Sheaths pilose; spikelets 2-6 *D. sericea*
- 1'. Sheaths glabrous; spikelets 1 or 2 2
- 2. Panicle simple or nearly so, usually contracted after anthesis; blades rarely more than 15 cm long, commonly less; teeth of lemma triangular *D. spicata*
- 2'. Panicle usually compound and somewhat open; blades

to 25 cm long; teeth of lemma long bristles *D. compressa*

Danthonia sericea Nutt. Downy oatgrass.

Culms erect, densely tufted, 50-100 cm tall; sheaths, especially the lower, pilose (rarely glabrous); blades 10-25 cm long, 2-4 mm wide, those of the innovations mostly involute, those of the culm mostly flat; panicle 5-10 cm long, relatively many-flowered, the branches bearing 2 to 6 spikelets, rather open or contracted after anthesis; glumes 12-17 mm long; lemmas densely long-pilose, especially along the margin, about 10 mm long, including the slender aristate teeth, the teeth about half the entire length; palea concave, narrowed toward the 2-toothed apex. Sand barrens in the Coastal Plain but scattered through the western part of the state.

Danthonia spicata (L.) Beauv. ex Roem. and Schult. Poverty oatgrass.

Poverty grass.

Culms 20-70 cm tall, mostly not more than 50 cm, slender, terete; leaves numerous in a basal cluster, the blades usually curled or flexuous, sheaths glabrous or pilose above the nodes, with a tuft of long hairs in the throat; blades usually not more than 12 cm long, filiform, to 2 cm wide, occasionally a few blades 15-20 cm long, subinvolute or in damp weather flat, glabrous or sparsely pilose; panicle 2-5 cm long, rarely longer, the stiff short branches bearing a single spikelet, or the lower longer with 2 (rarely 3 or 4), usually erect after anthesis; glumes 10-12 mm long (rarely longer); lemmas 3.5-5 mm long, sparsely villose except the 2-toothed summit, the teeth acuminate to subsetaceous; terminal segment of the awn about 5 mm long; palea broad, flat, obtuse, ciliolate, reaching to the base of the awn. Dry and sterile or rocky soil throughout the state.

Danthonia compressa Austin. Mountain oatgrass.

Culms on the average stouter and taller than in *D. spicata*, compressed, rather loosely tufted, sometimes decumbent or with short rhizomes, 40-80 cm tall; sheaths reddish above nodes, glabrous or sparsely pubescent on the collar, a conspicuous tuft of white hairs in the throat; blades elongate, some of them commonly 20-25 cm long, 2-3 mm wide, usually flat, sometimes involute and subfiliform, scabrous; panicle 5-8 cm long (rarely to 10 cm), the slender branches bearing 2 or 3 spikelets, contracted after anthesis but looser than in *D. spicata*; glumes 10-14 mm (usually about 12 mm) long; lemma and palea as in *D. spicata* but the teeth of the lemma aristate, 2-3 mm long. Meadows, open woods, open fields and woodland trails, common in the mountains but also in Brunswick and Surry Counties.

Deschampsia Beauv. Hairgrass.

Low or moderately tall perennials; panicles narrow or open; spikelets 2-flowered, disarticulating above glumes and between florets; glumes about equal, acute or acutish; lemmas truncate, 2- to 4-toothed at apex, bearded at base, with slender, straight, bent or twisted awn from or below the middle.

1. Blades filiform, flexuous; awn exerted, geniculate,
twisted *D. flexuosa*

1'. Blades flat or folded, stiff; awn included or slightly
exserted, straight *D. caespitosa*

Deschampsia flexuosa (L.) Trin. Crinkled hairgrass. Hairgrass.

Culms densely tufted, erect, slender, 30-80 cm tall; leaves mostly in a basal tuft, numerous, the sheaths scabrous, the blades involute, slender or setaceous, flexuous; panicle loose, open, nodding, 5-12 cm long, the capillary branches naked below,

the branchlets spikelet-bearing toward the ends; spikelets 4-5 mm long, purplish or bronze, the florets approximate; lemmas scabrous, the callus hairs about 1 mm long, the awn attached near the base, geniculate, twisted, 5-7 mm long. Dry or rocky woods, slopes and open ground scattered throughout the state.

Deschampsia caespitosa (L.) Beauv. Tufted hairgrass.

Culms in dense tufts, leafy at base, erect, 60-120 cm tall; sheaths smooth; blades 1.5-4 mm wide, often elongate, rather firm, flat or folded, scabrous above; panicle loose, open, nodding, 10-25 cm long, the capillary scabrous branches and branchlets spikelet-bearing toward the ends, spikelets 4-5 mm long, pale or purple-tinged, the florets distant, the rachilla internode half the length of the lower floret; glumes 1-nerved or the second obscurely 3-nerved, acute, about as long as the florets; lemmas smooth, the callus hairs short, awn from near the base, from straight and included to weakly geniculate and twice as long as the spikelet. Bogs and wet places of Giles and Page Counties.

Diarrhena Beauv.

Perennials with slender rhizomes, broadly linear, flat blades, long-tapering below and narrow few-flowered panicles; spikelets few-flowered, the rachilla disarticulating above the glumes and between the florets; glumes unequal, acute, shorter than the lemmas, the first 1-nerved, the second 3- to 5-nerved; lemmas chartaceous, pointed, 3-nerved, the nerves converging in the point, the upper floret reduced; palea chartaceous, obtuse, at maturity the lemma and palea widely spread by the large turgid beaked caryopsis with hard shiny pericarp.

Diarrhena americana Beauv. Twin grass.

Culms slender, about 1 m tall, arched-leaning, leaves approximate below the middle of the culm; sheaths pubescent toward the summit; blades elongate, 1-2 cm wide, scabrous to pubescent beneath; panicle long-exserted, drooping, 10-30 cm long, the branches few, appressed, the lower distant; spikelets 10-18 mm long, at first narrow, the florets expanded at maturity; lemmas 6-10 mm long. Rich or moist woods of Carroll, Patrick and Russell Counties.

Dichanthelium (Hitc. & Chase) Gould.

Perennials, typically tufted and usually forming in late summer or early fall a basal rosette of blades shorter and broader than those of the culms; culms stiffly erect or decumbent-erect, glabrous or hairy, 15-70 cm tall, infrequently to 150 cm or more tall; sheaths of main culms rounded on the back, often shorter than the culm internodes, glabrous or variously hairy; ligule usually a ring of hairs, infrequently a short membrane or absent; culm blades narrow or broad, usually flat, the reduced blades of secondary branches involute in some species; secondary branching after the first culm growth and elongation often resulting in densely clustered fascicles of often much-reduced leaves and inflorescences; inflorescence typically a small panicle with spreading or occasionally contracted branches, the spikelets short- or long-pedicelated, ovate, elliptical or obovate, awnless, 0.8-4.5 mm long, disarticulation below glumes; glumes both present, but the lower one often greatly reduced; first glume nerved or nerveless, mostly 1/4 to 1/3 as long as the spikelet but minute in a few species and 3/4 the length of the spikelet in others; lower floret usually neuter but staminate in a few species; upper floret perfect, with a shiny, glabrous, coriaceous lemma and palea, the lemma tightly inrolled over the palea; palea apex rounded, with minute symmetrical papillae in longitudinal rows and in

apical ridge with 7-12 large stomata in one or more rows (Brown and Smith, 1975; Gould and Clark, 1978).

1. Branches elongate, not more than 5 mm wide, 20 times as long as wide; autumnal phase branching from the base only 2
- 1'. Branches not elongate or, if so, more than 5 mm wide; autumnal phase not branching from the base 3
2. Spikelets about 3.1-4.5 mm long, beaked *D. depauperatum*
- 2'. Spikelets 2.2-3(3.2) long, not beaked *D. linearifolium*
3. Plants branching from the base, finally forming rosettes or cushions, the foliage soft, lax, similar to and only slightly shorter than culm blades 4
- 3'. Plants branching from the culm nodes or rarely remaining simple; basal rosette of short relatively broad, firm or thin blades usually conspicuously shorter than culm blades 5
4. Sheaths retrorsely pilose, uppermost at least 3/4 as long as those of basal tuft; blade margins glabrous or finely ciliate *D. laxiflorum*
- 4'. Sheaths glabrous or ascending-pilose; uppermost culm blade 1.5-6 cm long, less than 3/4 as long as those of basal tuft; blade margins coarsely papillose-ciliate *D. leucoblepharis*
5. Spikelets 3.3-5.2 mm long 6
- 5'. Spikelets 0.8-3.2 mm long 12
6. Blades of culm leaves, at least some, 1.3-3.5 cm broad 7
- 6'. Blades of culm leaves 1.2 cm or less broad 11
7. Spikelets broadly elliptic to obovate, turgid, usually with broad heavy nerves *D. oligosanthos*
- 7'. Spikelets narrowly elliptic to obovate, not turgid or strongly nerved 8
8. Culm nodes, at least the lowermost, bearded; spikelets 3.8-5.2 mm long 9
- 8'. Culm nodes glabrous or slightly pubescent; spikelets 3.3-3.8 mm long 10
9. Ligules up to 1.5 mm long; blades glabrous or puberulent; spikelets 4-5.2 mm long *D. boscii*
- 9'. Ligules 2.5-4 mm long; blades commonly puberulent-tomentose on one or both surfaces but occasionally nearly glabrous; spikelets 3.8-4.2 mm long *D. ravenelii*
10. Sheaths glabrous or softly villose; blades mostly 8-12 (-18) cm long *D. latifolium*
- 10'. Sheaths, at least the lower ones, papillose-hispid with spreading hairs; blades 10-28 cm long *D. clandestinum*
11. Midculm blades firm and stiff, long-acuminate at apex; lower culm internodes glabrous or hairy but not puberulent; spikelets 3.3-3.6 mm long *D. aciculare*
- 11'. Midculm blades thin or firm, not long-acuminate at apex;

- lower culm internodes various; spikelets 3.3-3.9 mm long . . . *D. sabulorum*
12. Blades of primary culms, at least some, 1.3-2.5 cm broad . . . 13
- 12'. Blades of primary culms up to 1.2 cm broad 16
13. Culm nodes, at least the lower ones, bearded, the lower internodes with long spreading hairs; glabrous-glandular band absent below culm nodes *D. scoparium*
- 13'. Culm nodes glabrous or slightly hairy, internodes typically glabrous-glandular 14
14. Lower blades cordate at base; ligule absent or a ring of hairs; spikelets 2.1-2.9 mm long 15
- 14'. Blades not cordate at base; ligule a fringed or glabrous membrane; spikelets 2.2-2.9 mm long *D. scabriusculum*
15. Spikelets (2.1-) 2.4-3.2 mm long, narrowly ovate or elliptic *D. commutatum*
- 15'. Spikelets 2.1-2.2 mm long, broadly elliptic to suborbicular *D. sphaerocarpon*
16. Blades, at least the lower ones, cordate or subcordate at base, mostly 6-12 mm broad *D. boreale*
- 16'. Blades not cordate nor subcordate at base, narrow or broad 17
17. Hairs of ligule or pseudoligule, at least some, 2-5 mm long 18
- 17'. Hairs of ligule or pseudoligule less than 2 mm long 19
18. Ligule with a dense ring of short hairs in front of a thin line of long hairs *D. ovale*
- 18'. Ligule without a dense ring of short hairs in front of line of long hairs *D. acuminatum*
19. Culm internodes glabrous or the lower ones slightly pilose; culm nodes bearded with long spreading hairs; blade surfaces glabrous or those of the lower leaves slightly pilose *D. dichotomum*
- 19'. Culm internodes, at least the lower ones, strigose or villose; culm nodes bearded with spreading or appressed hairs; blade surfaces glabrous or variously hairy *D. consanguineum*
- Dichantherium depauperatum* (Muhl.) Gould. Starved panic
Basionym: *Panicum depauperatum* Muhl.

Vernal phase with culms several to many in a tuft, slender but rather stiff, erect or nearly so; sheaths glabrous or papillose-pilose; blades 6-15 cm long, 2-5 mm wide, often involute in drying; panicle exserted, usually not much exceeding the leaves, 4-8 cm long, few-flowered; spikelets 3.2-3.8 mm long, elliptic, pointed, glabrous or sparsely pubescent; second glume and sterile lemma extending beyond the fruit, forming a beak. Autumnal phase similar, the reduced panicles concealed in basal leaves. Open sterile woods throughout the state.

Dichantherium linearifolium (Scribn.) Gould. Low panic grass

Basionym: *Panicum linearifolium* Scribn.

Synonym: *Panicum werneri* Scribn.

Vernal phase in dense tufts; culms slender, erect, 20-45 cm tall; sheaths papillose-pilose; blades erect, usually overtopping the panicles, 2-4 mm wide; panicle long-exserted, 5-10 cm long, the flexuous branches ascending; spikelets 2.2-2.7 mm

long, oblong-elliptic, obtuse, sparsely pilose. Autumnal phase similar, the reduced panicles hidden among basal leaves. Dry woods scattered in northwestern part of state and Tidewater area.

Dichanthelium laxiflorum (Lam.) Gould. Loose-flowered panic.

Basionym: *Panicum laxiflorum* Lamarck.

Synonym: *Panicum xalapense* H.B.K.

Vernal culms 20-60 cm tall, erect or geniculate below; nodes bearded with reflexed hairs; sheaths retrorsely pilose; blades 10-20 cm long, 7-12 mm wide, glabrous or sparsely ciliate; panicle 8-12 cm long, lax, few-flowered, the lower branches often reflexed; spikelets 2.2-2.3 mm long, papillose-pilose. Autumnal blades scarcely reduced, much exceeding the secondary panicles. Rich or damp woods scattered throughout the state.

Dichanthelium leucoblepharis (Trin.) Gould and Clark. No common name known.

Basionym: *Panicum leucoblepharis* Trin.

Synonym: *Panicum strigosum* Muhl.

Plants densely tufted, with leaves mostly in a basal tuft; culms 5-35 cm tall, not branching above base, sheaths glabrous or pilose, most frequently hairy on margins; ligule a minute fringe of hairs much less than 1 mm long; blades typically short and broad, mostly 3-6 cm long and 3-8 mm broad, usually coarsely ciliate with stiff, papilla-based hairs to well above middle, uppermost leaf blade usually much shorter than those below; panicles open, few-flowered, mostly 3-5 cm long, scarcely elevated above basal tuft of leaves or well-exserted on long peduncles; panicle axis usually pilose with spreading hairs; spikelets 1.1-2.1 mm long, glabrous to pubescent or puberulent, elliptic or slightly obovate, broadly pointed or rounded at apex; first glume broadly pointed or rounded at apex, one-third to half as long as spikelet; second glume and lemma usually 7-nerved. In shaded to somewhat open areas of pine forest mostly in sandy acidic soils of Dinwiddie and Prince George Counties and City of Norfolk.

Dichanthelium oligoanthes (Schultes) Gould. Few-flowered panic.

Basionym: *Panicum oligoanthes* Schultes.

Synonym: *Panicum scribnerianum* Nash.

Vernal culms 35-80 cm tall, appressed-pubescent, especially below; sheaths with ascending papillose pubescence; blades stiffly spreading or ascending, 6-14 cm long, 5-8 mm wide, glabrous or nearly so on upper surface, harshly puberulent beneath; panicle 6-12 cm long; spikelets long-pedicelated, 3.5-4 mm long, subacute, sparsely hirsute. Autumnal phase erect to spreading, branching freely from upper nodes. Sandy, usually moist woods scattered throughout the state.

Dichanthelium boscii (Poir.) Gould & Clark. No common name known.

Basionym: *Panicum boscii* Poir.

Culms stout, few to several in small clumps, 40-70 cm tall, in age branching above and often becoming top heavy and reclining; internodes glabrous, puberulent or papillose; nodes retrorsely bearded; sheaths glabrous, puberulent or papillose-pilose; ligule a fringe of hairs ca. 1 mm long; blades glabrous to pubescent or villose on one or both surfaces, 7-12 cm long, 15-30 mm broad, often asymmetrical, sparsely ciliate at the usually broad cordate base; panicles 4-10 cm long, to 8 cm broad, with stiffly erect-spreading, usually puberulent branches; spikelets papillose-pubescent,

narrowly ellipsoid to ovate, (3.7-) 4-5.2 mm long; first glume one-third to two-thirds the length of spikelet; lower floret often staminate. In shaded, well-drained forest sites scattered throughout the state.

Dichantherium ravenellii (Scribn & Merr.) Gould. No common name known.

Basionym: *Panicum ravenellii* Scribn. & Merr.

Vernal culms 30-70 cm tall, densely papillose-hirsute with ascending hairs, the nodes short-bearded; sheaths hirsute like culm; ligule 3-4 mm long; blades thick, 8-15 cm long, 1-2 cm wide, glabrous on upper surface, densely velvety-hirsute beneath; panicle 7-12 cm long; spikelets 4.3 mm long, sparsely papillose-pubescent. Autumnal phase more or less spreading, branching from middle and upper nodes, the short branches crowded at summit. Sandy or gravelly woods or open ground throughout the state.

Dichantherium latifolium (L.) Harvill. Broad-leaved panic.

Basionym: *Panicum latifolium* L.

Synonym: *Dichantherium latifolium* (L.) Gould & Clark.

Vernal culms from a knotted crown; culms 45-100 cm tall, glabrous or lower part sparsely pubescent; sheaths ciliate; blades 8-18 cm long, 1.5-4 cm wide, glabrous; panicle 7-15 cm long; spikelets 3.4-3.7 mm long. Autumnal culms more or less spreading, branching from the middle nodes, upper leaves of branches crowded and spreading, not much reduced. Rocky or sandy woods in western counties and also cities of Virginia Beach and Norfolk.

Dichantherium clandestinum (L.) Gould. Deer tongue.

Basionym: *Panicum clandestinum* L.

Vernal culms in large dense clumps, sometimes with strong rhizomes, 5-10 cm long, scabrous to papillose-hispid, at least below the nodes, 70-150 cm tall; sheaths strongly papillose-hispid to nearly glabrous; blades spreading or finally reflexed, 10-20 cm long, 1.2-3 cm wide, scabrous on both surfaces, at least toward the end, usually ciliate at base; panicle 8-15 cm long; spikelets 2.7-3 mm long. Autumnal culms erect or leaning, the branches leafy, the swollen bristly sheaths overlapping and wholly or partially enclosing the panicles. Moist mostly sandy ground throughout the state.

Dichantherium aciculare (Desv. ex Poir.) Gould & Clark. Narrow-leaved panic.

Basionym: *Panicum aciculare* Desva. ex Poir.

Synonyms: *Dichantherium angustifolium* (Ell.) Gould; *Dichantherium fusiforme* (Hitcch.) Harvill; *Panicum angustifolium* Ell.; *Panicum fusiforme* Hitcch.

Vernal culms ascending from a spreading base, 20-50 cm tall, appressed-pubescent below; lower sheaths villose; blades spreading or ascending, narrowed to an involute point, glabrous or the lower sparsely pilose, the middle culm blades 4-6 cm long, 2-5 mm wide; panicles 3-7 cm long, the flexuous branches spreading at maturity; spikelets 1.8-2 mm long, obovate. Autumnal phase bushy branching, the culms 10-30 cm long, spreading, forming dense cushions, the blades involute, sharp-pointed, usually arcuate, mostly 1-3 cm long. Sandy pine woods of Coastal Plain.

Dichantherium sabulorum (Lam.) Gould and Clark. American panic.

Basionym: *Panicum sabulorum* Lam.

Synonyms: *Panicum columbianum* Scribn; *Panicum oricola* Hitchc. & Chase; *Panicum patulum* (Scribn & Merr.) Hitchc.; *Panicum tsugetorum* Nash; *Panicum lanciarum* Trin.

Culms erect or trailing at the base, often much branched, 15-60 cm tall, usually with numerous nodes and short internodes, at least the lowermost minutely puberulent to short-pubescent, rarely glabrous; leaves typically glabrous on the surfaces and glabrous or pubescent on upper sheath margins, often coarsely ciliate on blade margins at and occasionally above the base; ligule a ring of hairs 0.2-1 (-1.5) mm long; blades thin, lanceolate, glabrous or puberulent, never with long hairs except for the marginal cilia, mostly 3-9 cm long and 3-8(-12) mm broad; panicles 3-9 cm long, typically open in age and occasionally with reflexed branches; spikelets puberulent to glabrous, 1.8-3.6 mm long, elliptic or slightly obovate, broadly rounded at apex; first glume broad or narrow, pointed, usually one-third or less as long as spikelet. Autumnal culms more freely branching, often forming large mats. In moist sand of woodland borders of Arlington, Augusta, Fauquier, Lee, Montgomery, Patrick, Prince William and Westmoreland Counties and Cities of Norfolk and Virginia Beach.

Dichantherium scoparium (Lam.) Gould. No common name known.

Basionym: *Panicum scoparium* Lam.

Vernal phase grayish olive green, velvety-pubescent throughout except on a viscid ring below nodes and at summit of sheath; culms 80-130 cm tall, stout, erect or ascending, usually geniculate at the base; blades rather thick, 12-20 cm long, 10-18 mm wide; panicle 8-15 cm long, the axis and branches with viscid blotches; spikelets 2.4-2.6 mm long, obovate, turgid, papillose-pubescent. Autumnal phase leaning or spreading, freely branching from middle nodes, forming flabellate fascicles. Wet or damp soil mostly in eastern part of the state although scattered through the western part.

Dichantherium scabriusculum (Ell.) Gould & Clark. No common name known.

Basionym: *Panicum scabriusculum* Ell.

Synonyms: *Panicum cryptanthum* Ashe.; *Panicum aculeatum* Hitchc. & Chase.

Vernal phase grayish olive green; culms erect, 1-1.5 m tall, scabrous at least below the nodes, sometimes puberulent; sheaths glabrous or more or less hispid at least toward summit, often mottled or white spotted, commonly swollen at base and contracted toward summit; blades stiffly ascending or spreading, often reflexed, 15-25 cm long, 9-12 mm wide, glabrous or scabrous, often more or less pubescent beneath; panicle 10-20 cm long; spikelets 2.3-2.6 mm long, ovate, glabrous or obscurely puberulent. Autumnal culms erect, branching from the middle and upper nodes, the branches appressed, finally forming dense oblong masses along the upper part of the primary culm, the panicles partly or entirely enclosed in the sheaths. Moist ground, especially along ditches, streams and swamps of Southampton and Arlington Counties. Harvill *et al.* list *D. scabriusculum* as a synonym of *D. scoparium*. Gould and Clark do not.

Dichantherium commutatum (Schult.) Gould & Clark. Variable panic.

Basionym: *Panicum commutatum* Schult.

Synonyms: *Panicum jorii* Vasey; *Panicum ashei* Pearson. *Panicum mutabile* Scribn. & Smith ex Nash.

Vernal culms 40-75 cm tall, erect; sheaths glabrous or nearly so; blades 5-12 cm long, 12-25 mm wide, glabrous on both surfaces or puberulent beneath; panicle 6-12 cm long; spikelets 2.6-2.8 mm long. Autumnal culms erect or leaning, branching from the nodes, the secondary branches crowded toward the summit. Woods and copses throughout the state.

Dichantherium sphaerocarpon (Ell.) Gould. Round-fruited panic.

Basionym: *Panicum sphaerocarpon* Ell.

Synonyms: *Panicum microcarpon* Ell.; *Panicum polyanthes* Schult.

Vernal phase light green; culms 20-80 cm tall, radiate-spreading, sometimes nearly erect, the nodes appressed-pubescent; blades 7-14 mm wide; panicle 5-10 cm long, about as wide; spikelets 1.6-1.8 mm long. Autumnal phase prostrate-spreading, sparingly branched late in the season from the lower and middle nodes, the branches short, mostly simple. Sandy soil throughout the state.

Dichantherium boreale (Nash) Freckmann. Northern panic.

Basionym: *Panicum boreale* Nash.

Synonym: *Panicum bicknellii* Nash.

Vernal culms usually erect, 30-50 cm tall, nodes mostly glabrous; blades erect or sometimes spreading, 7-12 mm wide, sparsely ciliate at rounded base; panicle loosely rather few-flowered, 5-10 cm long; spikelets 2-2.2 mm long, elliptic, pubescent. Autumnal phase erect or leaning, sparingly branched from all nodes in late summer, the branches erect, leaves and panicles not greatly reduced. Moist open ground or woods, Fairfax County.

Dichantherium ovale (Ell.) Gould & Clark.

Basionym: *Panicum ovale* Ell.

Synonyms: *Panicum addisonii* Nash; *Panicum mundum* Fernald; *Panicum commonsianum* Ashe.

Vernal culms 20-50 cm tall, erect or ascending, rather stout, long-pilose below with ascending or appressed hairs, often nearly glabrous above, nodes bearded, sheaths ascending-pilose; ligule 2-3 mm long, rather sparse; blades 5-10 mm wide, upper surface nearly glabrous except for long hairs near base and margins, lower surface appressed-pubescent; panicle 5-9 cm long; spikelets 2.7-2.9 mm long. Autumnal phase spreading-decumbent, the stiff culms rather loosely branching from middle and upper nodes. Dry sandy woods, Cities of Norfolk and Virginia Beach, Russell and Arlington Counties. Harvill *et al.*, list *D. ovale* as a synonym of *D. acuminatum*. Gould and Clark do not.

Dichantherium acuminatum (Swartz) Gould & Clark. Southern panic.

Basionym: *Panicum acuminatum* Swartz.

Synonyms: *Panicum albemarlense* Ashe; *Panicum auburne* Ashe; *Panicum huachucae* Ashe; *Panicum implicatum* Scribn.; *Panicum langinosum* Ell.; *Panicum longiligulatum* Nash; *Panicum meridionale* Ashe; *Panicum pseudopubescens* Nash; *Panicum spretum* Schult.; *Panicum tennesseense* Ashe; *Panicum villosissimum* Nash; *Panicum wrightianum* Scribn.

Plants with a well-developed rosette of broad, short basal leaves; culms 15-70 (-80) cm tall, usually becoming much-branched in age and commonly forming mats or pads of reduced branches and small few-flowered panicles, the nodes and internodes glabrous or more commonly hairy; ligule hairs well-developed, mostly 2-5 mm long but as short as 1 mm long; leaves glabrous to variously hairy; panicles

open or somewhat contracted, 2-12 cm long; spikelets ovate, elliptic or slightly obovate, glabrous or more commonly pubescent, 0.8-2.7 mm long; first glume broad, rounded or abruptly pointed, one-fifth to one-third as long as spikelet. Mostly in moist sandy soil of woodlands and woods borders scattered throughout the state.

Dichantherium dichotomum (L.) Gould forking panic. Bushy panic.

Basionym: *Panicum dichotomum* L.

Synonyms: *Panicum annulum* Ashe; *Panicum barbutatum* Hitchc.; *Panicum caeruleescens* Hack. ex Hitchc.; *Panicum clutei* Nash; *Panicum ensifolium* Baldw. ex Ell.; *Panicum lucidum* Ashe; *Panicum mattamuskeetense* Ashe; *Panicum microcarpon* Muhl. ex Ell.; *Panicum nitidum* Lam.; *Panicum roanokense* Ashe; *Panicum tenue* Muhl.; *Panicum trifolium* Nash; *Panicum yadkinense* Ashe.

Vernal phase often purplish; culms slender, erect from a knotted crown, 30-50 cm tall, lower nodes sometimes with a few spreading hairs; blades spreading, 4-8 mm wide, glabrous; panicle 4-9 cm long, the axis and branches flexuous; spikelets 2 mm long, elliptic, glabrous; second glume shorter than fruit at maturity. Autumnal phase much branched at middle nodes, lower part usually erect and devoid of blades, giving plants the appearance of miniature trees; blades numerous, often involute. Dry or sterile woods, swamps, or wet places.

Dichantherium consanguineum (Kunth.) Gould & Clark. No common name known.

Basionym: *Panicum consanguineum* Kunth.

Vernal culms ascending or spreading, 20-50 cm tall, densely felty-villose, especially the lower; blades 7-11 cm long, 5-8 mm wide, villose or nearly glabrous above; panicle 4-8 cm long, 5-8 mm wide, villose or nearly glabrous above, the lower branches narrowly ascending; spikelets 2.6-2.8 mm long, obovate, papillose-villose. Autumnal phase spreading or decumbent, the numerous branches somewhat flabellately fascicled, the blades 3-4 cm long, 2-3 mm wide, flat, thin, papery. Sandy pine woods of Chesterfield, King George, Prince George and Southampton Counties.

Digitaria Heister. Crabgrass.

Annual or perennial; culms erect, creeping or decumbent, racemes slender, digitate or approximate on short axis; first glume minute or wanting, second glume equalling or shorter than sterile lemma; fertile lemma cartilaginous with hyaline margins.

1. Rachis winged or flat-margined, the margin as wide as the central rib; plants annual, creeping at least at base 2
- 1'. Rachis wingless or with a very narrow margin, triangular; plants not creeping, annual or perennial 4
2. Sheaths glabrous; fertile lemma brown *D. ischaemum*
- 2'. Sheaths pilose or villose; fertile lemma pale 3
3. Spikelets 1.5-1.7 mm long; pedicels terete, glabrous *D. serotina*
- 3'. Spikelets 2.5-3.5 mm long; pedicels angled, scabrous *D. sanguinalis*
4. Spikelets 2-2.5 mm long; culms 0.75-1.5 m tall *D. villosa*
- 4'. Spikelets 1.5-1.7 mm long; culms 10-60 cm tall *D. filiformis*

Digitaria ischaemum (Schreb.) Schreb. ex Muhl. Smooth crabgrass.

Erect or usually soon decumbent-spreading, resembling *D. sanguinalis* but not so coarse or tall; foliage glabrous, bluish or purplish; racemes mostly 2 to 6, 4-10 cm long, the rachis with thin wings wider than the midrib; spikelets about 2 mm long; first glume hyaline, obscure; second glume and sterile lemma as long as the dark fertile lemma, pubescent with capitellate hairs. Waste places, often a troublesome weed in lawns scattered throughout the state. Introduced from Eurasia.

Digitaria serotina (Walt.) Michx. No common name known.

Creeping, sometimes forming extensive mats; flowering culms ascending or erect, 10-30 cm tall; leaves crowded on the creeping culms, the blades short; sheaths villose; blades 2-8 cm long, 3-7 mm wide; racemes usually 3 to 5, slender, often arcuate, 3-10 cm long, the rachis with thin wings wider than the midrib; spikelets pale, about 1.7 mm long; first glume wanting; second glume about one-third as long as the sterile lemma, both finely pubescent; fertile lemma pale. Pastures and waste places, Suffolk.

Digitaria sanguinalis (L.) Scop. Crabgrass. Large crabgrass. Hairy crabgrass. Common crabgrass.

Plant branching and spreading, often purplish, rooting at the decumbent base, the culms sometimes as much as 1 m long, the flowering shoots ascending; sheaths, at least the lower, papillose-pilose; blades 5-10 mm wide, pubescent to scaberulous; racemes few to several, 5-15 cm long, rarely longer, digitate, with usually 1 or 2 whorls a short distance below; spikelets about 3 mm long; first glume minute but evident; second glume about half as long as the spikelet, narrow; ciliate, sterile lemma strongly nerved, the lateral internerves appressed-pubescent, the hairs sometimes spreading at maturity; fertile lemma pale. Fields, gardens and waste places, a troublesome weed in lawns and cultivated ground throughout the state. Introduced from Europe.

Digitaria villosa (Walt.) Pers. No common name known.

Perennial at least in the southern states, in large tufts, purplish at base; culms 0.75-1.5 m tall, rarely branching; sheaths, at least the lower, grayish villose, sometimes sparsely so; blades elongate, 3-6 mm wide, often flexuous, from softly pilose to nearly glabrous; racemes 2 to 7, narrowly ascending, rarely somewhat spreading, rather distant, often naked at base, sometimes interrupted; spikelets 2-2.5 mm long, usually densely pubescent with softly capitellate hairs, the hairs longer than in *D. filiformis*, and sometimes only obscurely capitellate, the spikelets otherwise very like those of *D. filiformis*. Sandy fields and woods of Coastal Plain.

Digitaria filiformis (L.) Koel. Fingergrass.

Culms in small tufts, slender, usually erect, 10-60 cm tall, rarely taller, those of a tuft very unequal; lower sheaths pilose, the upper mostly glabrous; blades erect, usually 5-15 cm long (longer in more robust plants), 1-4 mm wide; racemes mostly 1 to 5, unequal, erect or ascending, mostly less than 10 cm long, somewhat distant, not fascicled; spikelets 1.5-1.7 mm long; first glume wanting; second glume and sterile lemma pubescent with short capitellate hairs, sometimes nearly glabrous, the glume shorter than the spikelet; fertile lemma dark brown, slightly apiculate. Sandy fields and sterile open ground scattered throughout the state.

Distichlis Raf. Saltgrass.

Low, dioecious perennials with extensively creeping scaly rhizomes, sometimes stolons, erect rather rigid culms and dense few-flowered panicles; spikelets several to many-flowered, the rachilla of the pistillate spikelets disarticulating above the glumes and between the florets; glumes unequal, broad, acute, keeled, 3- to 7-nerved, the lateral nerves sometimes faint; lemmas closely imbricate, firm, the pistillate coriaceous, acute or subacute, with 9 to 11 mostly faint nerves, palea as long as lemma or shorter.

Distichlis spicata (L.) Greene. Seashore saltgrass. Spikegrass.

Culms 10-40 cm tall, sometimes taller; leaves numerous, the sheaths closely overlapping, the spreading blades conspicuously distichous, flat to involute, sharp-pointed, mostly less than 10 cm long; panicle usually pale or greenish, 1-6 cm long, rarely longer; spikelets mostly 5- to 9-flowered, mostly 6-10 mm long, compressed; lemmas 3-6 mm long, the pistillate more coriaceous and more closely imbricate than the staminate; palea rather soft, narrow, the keels narrowly winged, entire; anthers about 2 mm long. Seashores, forming dense colonies in Coastal Plain.

Echinochloa Beauv.

Coarse, often succulent, annuals or perennials; panicle rather compact, of short, densely flowered, one-sided racemes along a main axis; spikelets planoconvex, often stiffly hispid, with one perfect flower; glumes unequal with stiff hairs; sterile lemma with an apical awn; fertile lemma and palea papery, long-pointed.

1. Racemes simple, rather distant, 1-2 cm long; spikelets crowded in about 4 rows, the awn of the sterile lemma reduced to a short point; blades 3-6 mm wide *E. colonum*
- 1'. Racemes more or less branched, usually more than 2 cm long; spikelets irregular, crowded and fascicled, usually not arranged in rows, awn of sterile lemma variable; blades usually more than 5 mm wide 2
2. Sheaths smooth; awns variable, but the panicle not a dense mass of long-awned spikelets *E. crusgalli*
- 2'. Sheaths, at least the lower, hispid or scabrous; panicle dense, the spikelets long-awned *E. walteri*

Echinochloa colonum (L.) Link. Jungle-rice. Jungle ricegrass. Shama millet.

Culms prostrate to erect, 20-40 cm long; blades rather lax, 3-6 mm wide, occasionally transversely zoned with purple; panicle 5-15 mm long; racemes several, 1-2 cm long, appressed or ascending, single or occasionally two approximate, the lower usually distant as much as 1 cm; spikelets about 3 mm long, crowded, nearly sessile; second glume and sterile lemma short-pointed, rather soft, faintly nerved, the nerves weakly hispid-scabrous. Ditches and moist places of Coastal Plain. Introduced.

Echinochloa crusgalli (L.) Beauv. Barnyard grass.

Culms erect to decumbent, stout, as much as 1 m or even 1.5 m tall, often branching at base; sheaths glabrous; blades elongate, 5-15 mm wide; panicle erect or nodding, purple-tinged, 10-20 cm long; racemes spreading, ascending or appressed, the lower somewhat distant, as much as 10 cm long, sometimes branched, the upper approximate; spikelets crowded, about 3 mm long, excluding the awns;

internerves hispidulous; nerves strongly tuberculate-hispid; awn variable, mostly 5-10 mm long on at least some of the spikelets, sometimes as much as 3 cm. Moist open places, ditches, cultivated fields and waste ground throughout the state.

Echinochloa walteri (Pursh) Hiller. No common name known.

Culms usually stout, erect, 1-2 m tall; sheaths papillose-hispid or papillose only, sometimes only the lower sheaths hispid or the hairs on the margins only; blades elongate; panicle dense, nodding, mostly 20-30 cm long, purplish; spikelets about 4 mm long, less turgid than in *E. crusgalli*; the stiff hairs on the nerves not tuberculate; awns mostly 1-2.5 cm long. Wet places, often in shallow water or brackish marshes of Coastal Plain and Piedmont; one report from Montgomery County.

Eleusine Gaertn.

Annuals with 2 to several rather stout spikes, digitate at summit of culms, sometimes with 1 or 2 a short distance below, or rarely with a single spike; spikelets few to several-flowered, compressed, sessile and closely imbricate in 2 rows along one side of a rather broad rachis, not prolonged beyond spikelets; rachilla disarticulating above glumes and between florets; glumes unequal, rather broad, acute, 1-nerved, shorter than first lemma; lemmas acute, with 3 strong green nerves close together forming a keel.

Eleusine indica (L.) Gaertn. Goosegrass. Yardgrass. Crabgrass. Wiregrass.

Branching at base, ascending to prostrate, very smooth; culms compressed, usually less than 50 cm long but sometimes as much as 1 m; blades flat or folded, 3-8 mm wide; spikes mostly 2 to 6, rarely more, or but 1 in depauperate plants, flat, 4-15 cm long. Waste places, fields and open ground throughout the state.

Elymus L. Wild-rye. Wild ryegrass.

Erect perennials in clumps; spikes densely flowered, terminal; spikelets 2- to 6-flowered, sessile, usually in pairs at alternate notches of zigzag rachis; glumes equal, stiff, narrow, sharp-pointed or awned, placed side-by-side in front of florets; lemmas convex, sharp-pointed or awned.

- 1. Glumes very narrow and bristle-like, not broadened above the base, nerves obscure *E. villosus*
- 1'. Glumes broader near the base, lanceolate or narrower, strongly 3-to several-nerved 2
- 2. Awns divergently curved when dry; base of glumes not terete *E. canadensis*
- 2'. Awns straight, base of glumes terete 3
- 3. Glumes about 1 mm wide about the middle, the bases not bowed out; palea much shorter than lemma *E. riparius*
- 3'. Glumes 1.5-2 mm wide about the middle, the bases bowed out; palea as long as lemma *E. virginicus*

Elymus villosus Muhl. Hairy wild-rye.

Culms in small tufts, ascending, slender, 60-100 cm tall; sheaths glabrous to pilose; blades flat, lax, pubescent on upper surface, glabrous and glossy to scabrous beneath; spike drooping, dense, 6-12 cm long; glumes subsetaceous, spreading, distinctly nerved above the firm cylindrical nerveless divergent or somewhat bowed-out base, hirsute, 12-20 mm long; lemmas nerved toward the tip, hispidulous to

hirsute, 7-9 mm long, about 1.2 mm across the back, the straight slender awn 1-3 cm long. Moist or dry woods and shaded slopes scattered throughout the state.

Elymus canadensis L. Canada wild-rye.

Green or often glaucous; culms erect, tufted, mostly 1-1.5 m tall; sheaths glabrous or rarely pubescent; blades flat, scabrous or sparsely hispid on the upper surfaces, mostly 1-2 cm wide; spike thick and bristly, nodding or drooping, often interrupted below, 10-25 cm long, sometimes glaucous; spikelets commonly in threes and fours, slightly spreading; glumes narrow, mostly 2- to 4-nerved, scabrous, sometimes hispid but less so than the lemmas, the bases somewhat indurate and divergent but scarcely bowed out, the awn about as long as the body; lemmas scabrous-hirsute to hirsute-pubescent, rarely glabrous, strongly nerved above, the awn divergently curved when dry, 2-3 cm long. River banks, open ground and sandy soil of Fairfax, Rockingham, Albemarle, Surry, Patrick, James City, Arlington, Giles, Wythe and Smyth Counties.

Elymus riparius Wiegand. No common name known.

Culms rather slender, erect, 1-1.5 m tall, sheaths glabrous; blades rather thin, flat, 5-15 mm wide, scabrous; spike somewhat nodding, 7-20 cm long; glumes narrow, about 1 mm wide at the middle, 2- to 4-nerved, somewhat indurate but scarcely bowed out at base; lemmas minutely hispidulous to glabrous, the awn straight, mostly 2-3 cm long. River banks and low ground scattered throughout the state.

Elymus virginicus L. Virginia wild-rye. Terrell grass. Wild rye.

Culms tufted, erect, 60-120 cm tall; sheaths glabrous; blades flat, scabrous, mostly 5-15 mm wide; spike usually erect, often partly included, 5-15 cm long; glumes strongly nerved, firm, indurate, yellowish, nerveless and bowed out at the base leaving a rounded sinus, broadened above (1.5-2 mm wide), scabrous, the apex somewhat curved, tapering into a straight awn, about as long as the body or shorter; lemmas glabrous and nerved above, tapering into a straight awn usually about 1 cm long. Moist ground, low woods and along streams throughout the state.

Eragrostis Beauv. Lovegrass.

Annuals or perennials of various habits; spikelets few- to many-flowered, florets usually closely imbricate; glumes somewhat unequal, shorter than first lemma, acute or acuminate; lemmas acute or acuminate, keeled or rounded on back, 3-nerved; palea about as long as lemma, keel sometimes ciliate.

1. Plants annual 2
- 1'. Plants perennial 9
2. Plants creeping, rooting at nodes forming mats *E. hypnoides*
- 2'. Plants often decumbent at base, but not creeping and forming mats 3
3. Spikelets mostly less than 5-flowered 4
- 3'. Spikelets mostly more than 5-flowered 5
4. Panicles two-thirds the entire length of plant or more, diffuse; culms erect, closely tufted *E. capillaris*
- 4'. Panicles less than half entire length of plant, open but scarcely diffuse; culms spreading or decumbent at base . . . *E. frankii*
5. Plants with glandular depressions on panicle branches, keel of lemmas or on margins of blades or keel of sheaths . 6

5. Plants not glandular on branches nor lemmas 7
6. Spikelets 2.5 mm wide; glands prominent on keel
of lemmas *E. cilianensis*
- 6'. Spikelets 1.5-2 mm wide, glandular depressions mostly
on panicle branches and leaves *E. poaeoides*
7. Spikelets about 1 mm wide, linear, slender *E. pilosa*
- 7'. Spikelets 1.5 mm wide or wider, ovate to linear 8
8. Spikelets linear at maturity, appressed along primary
panicle branches *E. pectinacea*
- 8'. Spikelets ovate to ovate-oblong, rarely linear, if linear
not appressed along primary panicle branches *E. multicaulis*
9. Nerves of lemma obscure; lemma rounded on back *E. hirsuta*
- 9'. Nerves of lemma evident, usually prominent;
lemmas keeled 10
10. Spikelets approximate in a somewhat condensed panicle *E. curvula*
- 10'. Spikelets in an open panicle 11
11. Panicle purple, the branches slender but rigid *E. spectabilis*
- 11'. Panicle green to leaden, branches capillary, fragile *E. refracta*

Eragrostis hypnoides (Lam.) B.S.P. Creeping lovegrass.

Annual, branching, creeping, and matlike; blades scabrous or pubescent on the upper surface; panicle elliptic, loosely few-flowered, 1-6 cm long, sometimes somewhat capitate; spikelets several- to many-flowered, linear, mostly 5-10 mm long, sometimes as much as 2 cm long in a dense cluster; flowers perfect; lemmas glabrous, acute, 1.5-2 mm long; palea about half as long as the lemma; grain 0.15 mm long; anthers about 0.2 mm long. Sandy river banks and wet ground, scattered throughout the state.

Eragrostis capillaris (L.) Nees. Lacegrass.

Annual; culms erect, 20-50 cm tall, much-branched at base, the branches erect; sheaths pilose, at least on the margin, long-pilose at the throat; blades flat, erect, pilose on upper surface near the base, 1-3 mm wide; panicle oblong or elliptic, open, diffuse, usually two-thirds the entire height of the plant, the branches and branchlets capillary; spikelets long-pedicel, 2- to 4-flowered, 2-3 mm long; glumes acute, 1 mm long; lemmas acute, about 1.5 mm long, obscurely nerved, rounded on the back, minutely scabrous toward the tip; grain 0.5 mm long, somewhat roughened. Dry open ground, open woods and fields throughout the state.

Eragrostis frankii C. A. Meyer. Frank's lovegrass.

Resembling *E. capillaris*; culms usually lower, spreading to erect; sheaths glabrous except the pilose throat; blades glabrous; panicle less than half the entire height of the plant, open but not diffuse, mostly less than half as wide as long, the branches ascending, the shorter pedicels not much longer than the spikelets; spikelets 3- to 5-flowered, 2-3 mm long. Sandbars, riverbanks and moist open ground in the western part of the state although it occurs in Chesapeake.

Eragrostis cilianensis (All.) Lutati. (Includes *E. megastachya* Link and *E. major* Host). Stinkgrass.

Weedy annual with disagreeable odor when fresh; culms ascending or spreading, 10-50 cm tall, with a ring of glands below the nodes; foliage sparsely beset with glandular depressions, the sheaths pilose at the throat; blades flat, 2-7 mm wide;

panicle erect, dark gray-green to tawny, usually rather condensed, sometimes open, 5-20 cm long, the branches ascending; spikelets oblong, compressed, 10- to 40-flowered, 5-15 mm long, 2.5-3 mm wide; lemmas in side view ovate, acutish, about 2.5 mm long, 1 mm wide from keel to margin, the keel scabrous toward apex and beset with a few glands, the lateral nerves prominent; palea about two-thirds as long as the lemma, minutely ciliate on the keels; grain ovoid, plump, 0.7 mm long; anthers 0.5 mm long. Cultivated ground, fields and waste places throughout the state. Introduced from the Old World.

Eragrostis poaeoides Beauv. ex Roem. & Schult. (= *E. minor* Host). Low lovegrass. Little lovegrass.

Annual; resembling *E. cilianensis*, mostly more slender; panicles rather more open, the spikelets smaller, 1.5-2 mm wide, the lemmas about 2 mm long, the glands sometimes obscure; anthers about 0.2 mm long. Waste places scattered throughout the state. Introduced from Europe.

Eragrostis pilosa (L.) Beauv. India lovegrass.

Weedy annual; culms slender, erect or ascending from a decumbent base, 10-50 cm tall; blades flat, 1-3 mm wide; panicle delicate, open, becoming somewhat diffuse, 5-20 cm long, the branches capillary, flexuous, ascending or spreading, finally somewhat implicate, the lower fascicled, sparsely long-pilose in the axils, spikelets gray to nearly black, linear, scarcely compressed, 3- to 9-flowered, 3-5 mm long, about 1 mm wide, the pedicels spreading, mostly longer than the spikelets; glumes acute, the first a little less than, the second a little more than, 1 mm long; lemmas loosely imbricate, the rachilla more or less exposed, rounded on the back, acute, 1.2-1.5 mm long, 0.5 mm wide from keel to margin, the nerves obscure; grain 0.6 mm long. Moist open ground and waste places throughout the state. Introduced from Europe.

Eragrostis pectinacea (Michx.) Nees. Tufted lovegrass.

Resembling *E. pilosa*; panicles less delicate, the axils glabrous or obscurely pilose, the somewhat larger spikelets appressed along the branches and branchlets, often longer than the pedicels; spikelets at maturity mostly linear, 5-8 mm long; lemmas 1.5-1.6 mm long, the rachilla not or scarcely exposed, the nerves evident; grain 6.8 mm long. Fields, waste places, open ground, moist places scattered throughout the state. Hitchcock notes that the name *E. pectinacea* has been misapplied to *E. spectabilis*.

Eragrostis multicaulis Stud. No common name known.

Annual; rather soft and lax; culms branching at base, erect to decumbent-spreading, 5-20 cm tall, sometimes taller; blades flat, usually 5-10 cm long, 1-2 mm wide; panicle open, mostly 4-10 cm long, about half as wide, the branches ascending or spreading, naked below, the spikelets appressed or ascending along the upper part, axils glabrous; panicle branches spikelet-bearing nearly to base; spikelets mostly 4- to 8-flowered, mostly 3-4 mm long. Waste places in Coastal Plain. Introduced from Eurasia.

Eragrostis hirsuta (Michx.) Nees. No common name known.

Perennial; culms erect, tufted, 50-120 cm tall; sheaths hirsute to glabrous, pilose at the throat and especially along the collar at each side; blades flat, elongate, 5-10 mm wide, becoming more or less involute, tapering to a fine point, scabrous on the upper surface; panicle diffuse, more than half the entire height of the plant, pilose

in the axils, branching 4 or 5 times; spikelets on long flexuous pedicels, ovate to ovate-oblong, 2- to 6-flowered (rarely to 8-flowered), 3-4 mm long; glumes acuminate, 1.5 and 2 mm long; lemmas rather turgid, 2 mm long, acute, the nerves obscure; grain oblong, 1 mm long, minutely striate and pitted. Dry soil, fields and open woods in eastern part of state.

Eragrostis curvula (Schrad.) Nees. Weeping lovegrass.

Culms 60-120 cm tall, densely tufted, erect, simple or sometimes branching at the lower nodes; sheaths narrow, keeled, glabrous or sparsely hispid, the lower densely hairy toward the base; blades elongate, involute, attenuate to a fine point, arcuate, spreading, scabrous; panicles 20-30 cm long, the branches solitary or in pairs, ascending, naked at the base, at least the lower, densely pilose in the axils; spikelets 7- to 11-flowered, 8-10 mm long, gray-green; lemmas about 2.5 mm long, obtuse or subacute, the nerves prominent. Cultivated for ornament and for erosion control throughout the state on road cuts.

Eragrostis spectabilis (Pursh) Stud. Purple lovegrass. Ticklegrass.

Perennial, in dense tufts, rarely producing short or slender rhizomes; culms stiffly erect to spreading, 20-60 cm tall; sheaths glabrous or pilose, conspicuously hairy at the throats; blades flat or folded, rather firm, stiffly ascending, tapering to a fine point, glabrous or rarely pilose, mostly 3-8 mm wide; panicle at first included at base, two thirds the entire height of the culm, diffuse, bright purple, rarely pale, branching 3 or 4 times, the axis stiff, the branches stiffly spreading toward maturity, rarely pilose, strongly pilose in the axis, the lower shorter than the middle ones, finally reflexed, the whole panicle breaking away and tumbling before the wind; spikelets long-pedicel, short-pedicel toward the ends of the branches, oblong to linear, 6- to 12-flowered, 4-8 mm long; glumes acute, a little more than 1 mm long; lemmas acute, about 1.5 mm long, slightly scabrous toward the tip, the lateral nerves prominent toward the base; palea somewhat bowed out, exposing the rather prominently short-ciliate keels; grain oval, dark-brown, 0.6 mm long. Sandy soil scattered throughout the state.

Eragrostis refracta (Muhl.) Scribn. No common name known.

Perennial; culms tufted, stiffly erect or spreading, 40-80 cm tall; sheaths glabrous, pilose at the throat; blades flat, elongate, more or less pilose on the upper surface near the base, 2-4 mm wide; panicle diffuse, fragile, usually more than half the entire height of the plant, branching 3 or 4 times, the branches capillary, spreading, lower branches usually finally reflexed, long-pilose in the axils, mostly 8- to 15-flowered, 5-12 mm long, about 2 mm wide, pale or gray; spikelets short-pedicel, appressed and distant along the nearly simple panicle branches; the lemmas on the average shorter than 2 mm. Low sandy soil throughout the state.

Erianthus Michx. Plumegrass.

Perennial, reedlike; panicles dense, silky; spikelets alike, in pairs along a slender axis, one sessile, the other pedicellate, rachis disarticulating below spikelets; glumes coriaceous, equal, usually copiously covered with long silky spreading hairs; sterile lemma hyaline; fertile lemma hyaline with midnerve extending into a slender awn; palea small, hyaline.

1. Spikelets naked, or nearly so, at base *E. strictus*
- 1'. Spikelets with a conspicuous tuft of hairs at base 2
2. Awn flat, spirally coiled at base, upper portion bent and

- flexuous or loosely spiral 3
2. Awn terete or flattened at base, not coiled, upper portion straight or slightly flexuous 4
3. Basal hairs nearly as long as the brownish spikelets; panicle not hairy; culms usually glabrous below panicle . . . *E. contortus*
- 3'. Basal hairs about twice as long as the yellowish spikelets; panicle conspicuously woolly; culms villose below panicle . . . *E. alopecuroides*
4. Basal hairs copious, much longer than spikelet; panicle conspicuously woolly *E. giganteus*
- 4'. Basal hairs rather sparse, shorter than spikelet; panicle not woolly 5
5. Uppermost blade not reduced, reaching summit of panicle; rachis joint and pedicel terete, sparsely long-pilose *E. brevibarbis*
- 5'. Uppermost blade usually much reduced; rachis joint and pedicel somewhat angled, sparsely short-pilose *E. coarctatus*
- Erianthus strictus* Baldw. Narrow plumegrass.

Culms 1-2 m tall, relatively slender, glabrous; nodes hirsute with stiff erect deciduous hairs; foliage glabrous, the lower sheaths narrow, crowded, the blades mostly 8-12 mm wide; panicle 20-40 cm long, strict, the branches closely appressed; spikelets brown, about 8 mm long, scabrous, nearly naked to sparsely short-hairy at base; awn straight, about 15 mm long; rachis joint and pedicel scabrous. Marshes and wet places of Coastal Plain.

Erianthus contortus Baldw. ex Ell. Bent-awn plumegrass.

Culms 1-2 m tall, glabrous or sometimes sparsely appressed-pilose below the panicle; nodes glabrous or pubescent with erect deciduous hairs; sheaths sparsely pilose at summit or glabrous; blades 1-1.5 cm wide, scabrous; panicle 15-30 cm long, narrow, the branches ascending but not closely appressed; spikelets 6-8 mm long, brownish, basal hairs nearly or about as long as the spikelet, awn about 2 cm long, spirally coiled at base; rachis joints and pedicels villose. Moist sandy pinelands or open ground of Sussex County.

Erianthus alopecuroides (L.) Ell. Silver plumegrass.

Culms robust, 1.5-3 m tall, appressed-villose below panicle and usually on nodes; sheaths pilose at summit; blades 1.2-2 cm wide, scabrous, pilose on upper surface toward base; panicle 20-30 cm long, silvery to tawny or purplish; spikelets 5-6 mm long, pale, sparsely villose, shorter than the copious basal hairs; awn 1-1.6 cm long, flat loosely twisted; rachis joint and pedicel long-villose. Damp woods, open ground and borders of fields mostly in Piedmont and Blue Ridge.

Erianthus giganteus (Walt.) Muhl. Sugar cane. Plumegrass.

Culms 1-3 m tall, appressed-villose below the panicle, the nodes appressed-hispid, the hairs deciduous; sheaths and blades from nearly glabrous to shaggy appressed-villose, the blades 8-15 mm wide; panicle 10-40 cm long, oblong or ovoid, tawny to purplish; spikelets 5-7 mm long, sparsely long-villose on the upper part, shorter than the copious basal hairs; awn 2-2.5 cm long, terete, straight or sub-flexuous, 1.5-1.6 cm long; rachis joint and pedicel sparsely long-pilose. Dry hills of Spotsylvania and Sussex Counties. Rare.

Erianthus brevibarbus Michx. Brown plumegrass.

Culms stout, nearly 2 m tall, with 9-10 nodes, glabrous; sheaths glabrous or sparingly pubescent at the summit; blades scabrous on upper surface, pilose at the base, 1-1.5 cm wide, the upper not reduced; panicle 35 cm long, tawny brown, not conspicuously woolly; spikelets 6-7 mm long; glumes acuminate, glabrous or with a few long hairs on the inflexed margins, the spreading basal hairs about two-thirds as long as the spikelet; awn terete, straight or subflexuous, 1.5-1.6 cm long. Moist places, Spotsylvania and Sussex Counties.

Erianthus coarctatus Fern. No common name known.

Culms relatively slender, 75-150 cm tall, subcompressed, the nodes bearded, appressed-pubescent, or glabrescent; sheaths glabrous, the lower narrow, somewhat keeled; blades 3-10 mm wide, scaberulous, the upper reduced; panicle 10-27 cm long, 2.5-4 cm wide, purplish-brown, not conspicuously woolly; spikelets 7-8 mm long; glumes acuminate, scaberulous, the first sometimes with a few long hairs on the back, the second without hairs on the inflexed margins, the basal hairs about half as long as the spikelet; awn terete, straight, 1.5-2.3 cm long, straight; rachis joint and pedicel somewhat angled, very sparsely short-pilose. Peaty, sandy, moist meadows, swales and swamp margins of Fall Belt. Rare.

Eriochloa H.B.K. Cupgrass.

Annual or perennial; often branching grasses with terminal panicles of several to many spreading or appressed racemes usually approximate along a common axis; spikelets more or less pubescent, solitary or sometimes in pairs, short-pedicelod or sessile, in two rows on one side of a narrow rachis, the back of the fertile lemma turned from the rachis; lower rachilla joint thickened, forming a more or less ringlike, usually dark-colored callus below the second glume, the first glume reduced to a minute sheath about this and adnate to it; second glume and sterile lemma about equal, the lemma enclosing a hyaline palea or sometimes a staminate flower; fertile lemma indurate, minutely papillose-rugose, mucronate or awned, the awn often readily deciduous, margins slightly inrolled.

Eriochloa contracta Hitchc. Prairie cupgrass.

Annual; culms erect or sometimes decumbent at base, pubescent at least about the nodes, 30-70 cm tall; blades pubescent, usually not more than 5 mm wide; panicle usually less than 15 cm long, contracted, cylindric, the racemes appressed, closely overlapping, 1-2 cm long, the axis and rachises villose; spikelets 3.5-4 mm long, excluding the awn-tip, appressed villose; glume awn-tipped; sterile lemma slightly shorter, acuminate, empty; fruit 2-2.5 mm long, with an awn nearly 1 mm long. Open ground, ditches, low fields and wet places, Arlington County. Introduced.

Festuca L. Fescue.

Low or rather tall annuals or perennials; culms mostly tufted, erect; panicles terminal with 2- to several-flowered spikelets; glumes narrow, acute, unequal; lemmas narrow, sharp-pointed or tapering into a straight awn.

- 1. Plants annual 2
- 1'. Plants perennial 5
- 2. Spikelets mostly more than 5-flowered; lemma margin inrolled, not scarious *F. octoflora*
- 2'. Spikelets mostly less than 5-flowered; lemmas usually scarious-margined 3

3. Lemmas appressed-pubescent over the back *F. sciurea*
- 3'. Lemmas glabrous, scabrous or ciliate, not pubescent
over the back 4
4. First glume two-thirds to three-fourths as long as
the second *F. dertonensis*
- 4'. First glume much shorter than second, 1-2 mm long *F. myuros*
5. Blades flat, rather soft and lax, mostly more than
3 mm wide 6
- 5'. Blades involute or if flat less than 3 mm wide 7
6. Spikelets oblong to linear, mostly 8- to 10-flowered and
more than 1 cm long *F. elatior*
- 6'. Spikelets ovate or oval, mostly not more than 5-flowered,
less than 1 cm long 8
7. Spikelets loosely scattered in a very open panicle with
long slender branches *F. obtusa*
- 7'. Spikelets somewhat aggregate toward the ends of rather
short branches of a less open panicle *F. paradoxa*
8. Culms decumbent at usually red, fibrillose base,
in loose tufts *F. rubra*
- 8'. Culms erect 9
9. Lemmas awnless *F. capillata*
- 9'. Lemmas awned *F. ovina*

Festuca octoflora Walt. Six-weeks fescue.

Culms erect, usually 15-30 cm tall, sometimes as much as 60 cm; blades narrow, involute, 2-10 cm long; panicle narrow, the branches short, appressed or spreading; spikelets 6-8 mm long, densely 5- to 13-flowered; glumes subulate-lanceolate, the first 1-nerved, the second 3-nerved, 3-4.5 mm long; lemmas firm, convex, lanceolate, glabrous or scabrous, 4-5 mm long, the margins not scarious; awn commonly 3-5, sometimes 7 mm long. Open sterile ground scattered throughout the state.

Festuca sciurea Nutt. No common name known.

Culms erect, 15-50 cm tall; blades less than 1 mm wide, often capillary, soft, mostly involute, 1-10 cm long; panicle narrow, 5-20 cm long; spikelets 4- to 6-flowered, 4-5 mm long; first glume 2 mm long, the second 3.5 mm long; lemmas 3-3.5 mm long, sparsely appressed-pubescent; awn 6-11 mm long. Open ground of Coastal Plain.

Festuca dertonensis (All.) Aschers. & Graebn. No common name known.

Culms to 60 cm tall, sheaths and narrow blades glabrous; panicle narrow, less than 20 cm long; first glume about 4 mm long, second 6-7 mm long; lemma lanceolate, scabrous on back toward apex, 7-8 mm long, awn 10-13 mm long. Dry hills and meadows, Accomack County. Rare in eastern United States.

Festuca myuros L. Rattail fescue.

Plants annual; culms erect; blades narrow, involute; spikelets mostly less than 5-flowered; panicle narrow, branches appressed; first glume 1-1.5 mm, the second 4-4.5 mm long; lemmas not ciliate. Open ground of Coastal Plain and Pulaski County. Introduced from Europe.

Festuca elatior L. English bluegrass. Meadow fescue. Tall meadow fescue.

Culms 50-120 cm tall; blades flat, 4-8 mm wide, scabrous above; panicle erect, or nodding at summit, 10-20 cm long, contracted after flowering, much branched or nearly simple, the branches spikelet-bearing nearly to base; spikelets usually 6- to 8-flowered, 8-12 mm long; glumes 3 and 4 mm long, lanceolate; lemmas oblong-lanceolate, coriaceous, 5-7 mm long, the scarious apex acutish, rarely short-awned. Meadows, roadsides and waste places scattered throughout the state. Native to Eurasia. This taxon includes *F. arundinacea* Schreb., Reed fescue, Alta fescue, and *F. pratensis* Huds., Meadow fescue.

Festuca obtusa Biehler. Nodding fescue.

Culms solitary or few in a tuft, mostly 50-100 cm tall; blades flat, lax, somewhat glossy, 4-7 mm wide; panicle nodding, very loose and open, the branches spreading, spikelet-bearing toward the ends, the lower usually reflexed at maturity; spikelets 3- to 5-flowered; glumes about 3 and 4 mm long; lemmas coriaceous, rather turgid, about 4 mm long, obtuse or acutish, the nerves very obscure. Low or rocky woods throughout the state.

Festuca paradoxa Desv. No common name known.

Culms few to several in a tuft, 50-110 cm tall, widely leaning; blades flat or subinvolute in drying, lax, 4-8 mm wide; panicle 12-20 cm long, heavily drooping, the slender scabrous branches not so long as in *F. obtusa*; the brownish spikelets somewhat aggregate toward the ends; spikelets 3- to 6-flowered; the lemmas more blunt. Low open ground and thickets of western Coastal Plain and Piedmont.

Festuca rubra L. Red Fescue.

Culms usually loosely tufted, bent or decumbent at the reddish or purplish base, occasionally closely tufted, erect to ascending, 40-100 cm tall; lower sheaths brown, thin, and fibrillose; blades smooth, soft, usually folded or involute; panicle 3-20 cm long, usually contracted and narrow, the branches mostly erect or ascending; spikelets 4- to 6-flowered, pale green or glaucous, often purple-tinged; lemmas 5-7 mm long, smooth, or scabrous toward apex, bearing an awn about half as long. Meadows, hills, bogs and marshes scattered throughout the state.

Festuca capillata Lam. (= *F. tenuifolia* Sibth.). Hair fescue. Slender fescue.

Densely tufted, more slender and lower than *F. ovina*; blades capillary, flexuous, usually more than half as long as the culm; spikelets smaller; lemmas about 3 mm long, awnless. Lawns and waste places, Fairfax, Giles and Montgomery Counties. Introduced from Europe.

Festuca ovina L. Sheep fescue.

Culms densely tufted, usually 20-40 cm tall; blades slender, involute, from very scabrous to glabrous, the innovations numerous in a basal cluster, 5-10 cm long or sometimes longer; panicle narrow, sometimes almost spikelike, 5-8 cm long, sometimes longer; spikelets mostly 4- to 5-flowered; lemmas about 4-5 mm long, short-awned. Open woods and stony slopes scattered throughout central and western parts of the state.

Glyceria R. Br. Mannagrass.

Tall aquatic or marsh perennials with unbranched culms; panicles terminal; spikelets several-flowered; glumes unequal, shorter than the florets; lemmas convex, firm with colorless margins.

1. Spikelets linear, nearly terete, usually 1 cm or more long, appressed; panicles narrow, erect 2

- 1'. Spikelets ovate or oblong, more or less compressed, usually not more than 5 mm long; panicles usually nodding 4
2. Lemmas acute, much exceeded by palea *G. acutiflora*
- 2'. Lemmas obtuse; palea about as long as, or slightly longer than, lemma 3
3. Lemmas about 3 mm long *G. arkansana*
- 3'. Lemmas 4 to 7 mm long *G. septentrionalis*
4. Lemmas with 7 usually prominent nerves; second glume 1-nerved; sheaths, at least the upper, closed from below the summit 5
- 4'. Lemmas with 5 prominent nerves; second glume 3-nerved; sheaths open *G. pallida*
5. Panicle contracted, narrow 6
- 5'. Panicle open, lax 7
6. Lemmas 3-4 mm long; panicle oblong, dense, usually not more than 100 cm long *G. obtusa*
- 6'. Lemmas 2-2.5 mm long; panicle rather loose, nodding, 15-25 cm long *G. melicaria*
7. Nerves of lemma evident but not prominent *G. canadensis*
- 7'. Nerves of lemma prominent 8
8. First glume not more than 1 mm long *G. striata*
- 8'. First glume more than 1 mm long, usually about 1.5 mm long *G. grandis*

Glyceria acutiflora Torr. No common name known.

Culms compressed, lax, creeping and rooting below, 50-100 cm long; blades flat, lax, 10-15 cm long, 3-6 mm wide, scabrous on the upper surface; panicle 15-35 cm long, often partly included, the branches rather stiff, bearing 1 or 2 spikelets, or the lower 3 or more; spikelets 5- to 12-flowered, 2-4 cm long, 1-2 mm wide, the lateral pedicels 1-3 mm long; glumes about 2 and 5 mm long; lemmas 7-nerved, acute, scabrous, 6-8 mm long, exceeded by the acuminate, 2-toothed paleas. Wet soil and shallow water in northern ridges and valleys.

Glyceria arkansana Fern. No common name known.

Resembling *G. septentrionalis*; first glume 2-2.5 mm long; lemmas 3-3.5 mm long, hirtellous rather than scaberulous. Wet ground of Coastal Plain.

Glyceria septentrionalis Hitchc. Eastern mannagrass.

Culms 1-1.5 m tall, somewhat succulent; sheaths smooth; blades flat, mostly 10-20 cm long, 4-8 mm wide, usually smooth beneath, slightly scaberulous on the upper surface and margin; panicle 20-40 cm long, somewhat open, the branches as much as 10 cm long, several-flowered, often spreading at anthesis; spikelets 1-2 cm long, 6- to 12-flowered, the florets rather loosely imbricate; glumes 2-3 and 3-4 mm long; lemmas pale or green, about 4 mm long, narrowed only slightly at the summit, scaberulous, the paleas usually exceeding them. Shallow water and wet places, scattered throughout the state.

Glyceria pallida (Torr.) Trin. Pale mannagrass.

Culms slender, lax, ascending from a decumbent rooting base, 30-100 cm long; sheaths open, blades mostly 4-8 mm wide; panicle pale green, open, 5-15 cm long, the branches ascending, flexuous, finally more or less spreading; spikelets some-

what elliptic, 4- to 7-flowered, 6-7 mm long; glumes 1.5-2 and 2-2.5 mm long, the second 3-nerved; lemmas 2.5-3 mm long, scaberulous, obtuse, the scarious tip erose; anthers linear, about 1 mm long; caryopsis with a crown of white hairs 0.2-0.25 mm long. Shallow cold water of Coastal Plain, also Highland Co. (Transferred to *Puccinellia* by Clausen, 1952).

Glyceria obtusa (Muhl.) Trin. No common name known.

Culms erect, often decumbent at base, 50-100 cm tall, rather firm; blades elongate, erect, mostly smooth, flat or folded, 2-6 mm wide; panicle erect, oblong or narrowly elliptic, dense, 5-15 cm long, the branches ascending or appressed; spikelets mostly 4- to 7-flowered, 4-6 mm long, green or tawny, the rachilla joints very short; glumes broad, scarious, 1.5 and 2 mm long; lemmas firm, faintly nerved, smooth, 3-4 mm long, obtuse, the scarious tip narrow, often revolute. Bogs and marshy places mostly near the coast; also Warren, Rappahannock and Augusta Counties.

Glyceria melicaria (Michx.) Hubb. No common name known.

Culms slender, solitary or few, 60-100 cm tall; blades elongate, scaberulous, 2-5 mm wide; panicle narrow but rather loose, nodding, 15-25 cm long, the branches erect, rather distant; spikelets 3- or 4-flowered, about 4 mm long, green; glumes about 1.5 and 2 mm long, acutish, smooth, the nerves rather faint. Swamps and wet woods of valleys and ridges in western part of the state.

Glyceria canadensis (Michx.) Trin. Rattlesnake mannagrass. Rattlesnake grass.

Culms erect, solitary or few in a tuft, 60-150 cm tall; blades scabrous, 3-7 mm wide; panicle open, 15-20 cm long, nearly as wide, the branches rather distant, drooping, naked below; spikelets ovate or oblong, 5- to 10-flowered, 5-6 mm long, the florets crowded, spreading; glumes about 2 and 3 mm long; lemmas 3-4 mm long, the nerves obscured in the firm tissue of the lemma; palea bowed out on the keels, the floret somewhat tumid. Bogs and wet places in Alleghany, Augusta, Giles, Highland, Montgomery and Prince George Counties.

Glyceria striata (Lam.) Hitchc. Fowl mannagrass. Fowl meadowgrass.

Plants in large tussocks, pale green; culms erect, slender, rather firm, 30-100 cm tall, sometimes taller; blades erect or ascending, flat or folded, moderately firm, usually 2-6 mm wide, sometimes to 9 mm; panicle ovoid, open, 10-20 cm long, nodding, the branches ascending at base, drooping, naked below; spikelets ovate or oblong, 3- to 7-flowered, 3-4 mm long, often purplish, somewhat crowded toward the ends of the branchlets; glumes about 0.5 and 1 mm long, ovate, obtuse; lemmas oblong, prominently 7-nerved, about 2 mm long, the scarious tip inconspicuous; palea rather firm, about as long as the lemma, the smooth keels prominent, bowed out. Moist meadows and wet places throughout the state.

Glyceria grandis A. Wats. American mannagrass. Reed meadowgrass.

Culms tufted, stout, 1-1.5 m tall; blades flat, 6-12 mm wide; panicle large, very compound, 20-40 cm long, open, nodding at summit; spikelets 4- to 7-flowered, 5-6 mm long; glumes whitish, about 1.5 and 2 mm long; lemmas purplish, about 2.5 mm long; palea rather thin, about as long as the lemma. Banks of streams, marshes and wet places, Arlington, Highland, James City and New Kent Counties.

Gymnopogon Beauv.

Perennials with short, stiff, flat blades, often folded in drying, spikes numerous, long, slender, divergent or reflexed; spikelets 1- or rarely 2- or 3-flowered, nearly sessile, appressed, and usually remote in 2 rows along one side of a slender continuous rachis; glumes narrow, acuminate, 1-nerved, usually longer than floret; lemmas narrow, 3-nerved, the lateral nerves near the margin, apex minutely bifid, bearing a slender awn between the teeth.

1. Awn 4-6 mm long, longer than lemma *G. ambiguus*

1'. Awn 1-3 mm long, usually shorter than lemma *G. brevifolius*

Gymnopogon ambiguus (Michx.) B.S.P. No common name known.

Culms 30-60 cm tall in small clumps with short scaly rhizomes, suberect to spreading, rigid, sparingly branching; leaves numerous, approximate with overlapping sheaths, or the lower rather distant; blades spreading, 5-15 mm mostly about 10 mm wide, the base rounded-truncate; spikes 10-20 cm long, floriferous from base, the lower spikelets often remote; glumes 4-6 mm long; lemma with an awn 4-6 mm long, the rudiment bearing a delicate shorter awn. Dry pinelands of Coastal Plains.

Gymnopogon brevifolius Trin. No common name known.

Differing from *G. ambiguus* in the longer, more slender, somewhat straggling culms, narrower, less crowded blades, and in the subcapillary spikes, floriferous only on the upper half or third; lemma awnless or with a minute awn. Dry ground of Coastal Plain.

Holcus L.

Perennials with flat blades and contracted panicles; spikelet 2-flowered, the pedicel disarticulating below the glumes, the rachilla curved and somewhat elongate below first floret, not prolonged above second floret; glumes about equal, longer than the 2 florets; first floret perfect, lemma awnless, second floret staminate, lemma with short awn on back.

Holcus lanatus L. Velvet grass. Yorkshire fog.

Plant grayish, velvety-pubescent; culms erect, 30-100 cm tall, rarely taller; blades 4-8 mm wide; panicles 8-15 cm long, contracted, pale, purple-tinged; spikelets 4 mm long; glumes villose, hirsute on the nerves, the second broader than the first, 3-nerved; lemmas smooth and shining, the awn of the second hooklike. Open ground, meadows and moist places throughout the state.

Hordeum L. Barley

Annual or perennial low or rather tall grasses with flat blades; spikes dense, bristly; spikelets 1-flowered, 3 together at each node of the articulate rachis; middle spikelet sessile, lateral ones pediceled; glumes narrow, often subulate and awned, standing in front of spikelet; lemmas rounded on back, back turned from rachis, 5-nerved, usually obscurely so, tapering into a long awn.

1. Plants perennial; awns slender; auricle wanting *H. jubatum*

1'. Plants annual, branching at base; awns mostly stouter 2

2. Blades with prominent auricle at base *H. murinum*

2'. Blades without auricles *H. pusillum*

Hordeum jubatum L. Foxtail barley. Squirreltail grass.

Perennial, tufted; culms erect, or decumbent at base, 30-60 cm tall; blades 2-5 mm wide, scabrous; spike nodding, 5-10 cm long, about as wide, soft, pale; lateral

spikelets reduced to 1 to 3 spreading awns; glumes of perfect spikelet awnlike, 2.5 - 6 cm long, spreading; lemma 6-8 mm long with an awn as long as the glumes. Open ground, meadows and waste places. Sparse in western part of state.

Hordeum murinum L. Wild barley. Foxtail. Wall barley.

Annual, without a distinctly bulbous swelling at the base of the culm; leaves broad, flat, with long distinct auricles; spikes long and comparatively broad, central spikelets less than 2 mm wide, with awns of lemmas very long and stiff, glumes flattened, more or less lanceolate, often ciliate in basal parts; lateral spikelets large, inflated, central floret self-pollinating, usually closed, lateral, usually male flowers often open; caryopsis more than 3 mm broad. Riverbeds, waterholes, or marsh areas, James City, Chesterfield and Fluvanna Counties. Native of northeast Europe, North Africa, mideast to central Asia. *Hordeum murinum* ssp. *glaucum* (Steudel) Tzvelez is common in the summer annual habitats of western USA, while *Hordeum murinum* ssp. *leporinum* (Link) Arcang. is often found in winter annual habitats. The *H. murinum* of Harvill is probably ssp. *leporinum* (Bothmer and Jacobsen, 1985). Hitchcock and Chase (1951) noted that *H. leporinum* Link, and *H. stebbensii* Coon have been confused with *H. murinum* of Europe.

Hordeum pusillum Nutt. Little barley. Little wild barley.

Annual; culms 10-35 cm tall; blades erect, flat, the auricle wanting; spike erect, 2-7 cm long, 10-14 mm wide; first glume of the lateral spikelets and both glumes of the fertile spikelet dilated above the base, attenuate into a slender awn 8-15 mm long, the glumes very scabrous; lemma of central spikelet awned, of lateral spikelets awn-pointed. Plains and open, especially alkaline, ground throughout eastern and central part of the state.

Hystrix Moench.

Erect perennials with flat blades and bristly, loose-flowered spikes; spikelets 2- to 4-flowered, 1 to 4 at each node of a continuous flattened rachis, horizontally spreading or ascending at maturity; glumes reduced to short or minute awns, the first usually obsolete, both often wanting in the upper spikelets; lemmas convex, rigid, tapering into long awns, 5-nerved, the nerves obscure except toward the tip; palea about as long as body of lemma.

Hystrix patula Moench. Bottlebrush. Bottlebrush grass.

Culms slender, 60-120 cm tall; sheaths glabrous or scabrous, rarely retrorsely pubescent, blades mostly 7-15 mm wide; spike nodding, 8-15 cm long, the internodes of the slender rachis 5-10 mm long; spikelets mostly in pairs, 1-1.5 cm long, horizontally spreading toward maturity; lemmas glabrous or sometimes coarsely pubescent, the awns 1-4 cm long, slender, straight. Moist or rocky woods throughout the state.

Leersia Swartz. Ricegrass.

Perennials; spikelets 1-flowered, in short racemes arranged in open panicles; glumes none; lemma boat-shaped, awnless; palea as long as lemma.

1. Spikelets broadly oval, 3-4 mm wide *L. lenticularis*
- 1'. Spikelets elliptic, not more than 2 mm wide 2
2. Panicle narrow, the branches ascending or appressed . . . *L. hexandra*
- 2'. Panicle open, the capillary branches finally spreading . . . 3
3. Lower panicle branches solitary; spikelets 3 mm long,
1 mm wide *L. virginica*

- 3'. Lower panicle branches fascicled; spikelets 5 mm long,
1.5-2 mm wide *L. oryzoides*

Leersia lenticularis Michx. Catchfly grass.

Culms straggling, 1-1.5 m tall, with creeping scaly rhizomes; sheaths scabrous at least toward the summit; blades lax, 1-2 cm wide; panicle open, drooping, 10-20 cm long, the branches ascending or spreading, naked below, branched above, branchlets bearing closely imbricate spikelets along one side; spikelets pale, broadly oval, very flat, 4-5 mm long, sparsely hispidulous, the keels bristly ciliate. Ditches and swamps of Coastal Plain.

Leersia hexandra Swartz. Southern cutgrass.

Culms slender, weak, usually long-decumbent from a creeping and rooting base, with slender rhizomes and extensively creeping leafy stolons, the flowering culms upright; blades rather stiff, 2-5 mm wide; panicle narrow, 5-10 cm long, the branches ascending or appressed, floriferous nearly to the base; spikelets oblong, about 4-5 mm long, a little more than 1 mm wide, often purplish, sparsely hispidulous, the keel bristly ciliate. Shallow water, ditches and wet places near the coast, Arlington and Sussex Counties.

Leersia virginica Willd. Whitegrass.

Culms slender, weak, branching, 50-120 cm tall, with clusters of very scaly rhizomes much stouter than the culm base; blades relatively short, 6-12 mm wide; panicle open, 10-20 cm long, the capillary branches rather distant, stiffly spreading, naked below, those of the branches smaller, sometimes included in the sheath; spikelets oblong, closely appressed to the branchlets, about 3 mm long and 1 mm wide, sparsely hispidulous, the keels short-hispid. Low woods and moist places throughout the state.

Leersia oryzoides (L.) Swartz. Rice cutgrass.

Culms slender, weak, often decumbent at base, 1-1.5 m tall, with slender creeping rhizomes; sheaths and blades strongly retrorsely scabrous, the blades mostly 8-10 mm wide; panicles terminal and axillary, 10-20 cm long, the flexuous branches finally spreading, the spikelets more loosely imbricate than in *L. lenticularis*; spikelets elliptic, 5 mm long, 1.5-2 mm wide, sparsely hispidulous, the keels bristly ciliate, axillary panicles partly included in the sheaths, the spikelets cleistogamous. Marshes, river banks and wet places, often forming a zone around ponds and lakes throughout the state.

Leptochloa Beauv. Sprangle top.

Annuals; panicles long or short; spikes or racemes usually slender, numerous, one common axis; spikelets 2- to several-flowered, sessile or short-pedicel; glumes unequal or nearly equal, usually shorter than first lemma; lemmas obtuse or acute, sometimes 2-toothed and mucronate or short-awned from between the teeth.

1. Sheaths papillose; spikelets mostly 1-2 mm long *L. filiformis*
1'. Sheaths smooth or scabrous, not papillose; spikelets
more than 2 mm long *L. fascicularis*

Leptochloa filiformis (Lam.) Beauv. Red sprangle top.

Annual; the foliage and panicles often reddish or purple; culms erect or branching and geniculate below, 40-70 cm tall, or often dwarf; sheaths papillose-pilose, sometimes sparsely so; blades flat, thin, as much as 1 cm wide; panicle

somewhat viscid, of numerous approximate slender racemes, 5-15 cm long, on an axis mostly about half the entire length of the culm; spikelets 3- to 4-flowered, 1-2 mm long, rather distant on the rachis; glumes acuminate, longer than the first floret, often as long as the spikelet; lemmas awnless, pubescent on the nerves, 1.5 mm long. Open or shady ground, a common weed in gardens and fields of Coastal Plain.

Leptochloa fascicularis (Lam.) A. Gray. No common name known.

Annual, somewhat succulent; culms erect to spreading or prostrate, freely branching, 30-100 cm tall; blades flat to loosely involute; panicles more or less included, mostly 10-20 cm long, often smaller, occasionally longer, the racemes several to numerous, as much as 10 cm long, usually ascending or appressed, or at maturity spreading; spikelets usually overlapping, 7-12 mm long, 6- to 12 flowered; lemmas 4-5 mm long, the lateral nerves pubescent below, acuminate, the awn from short to as long as the body. Brackish marshes along coast.

Leptoloma Chase.

Branching perennials with brittle culms, felty-pubescent at base, flat blades, and open or diffuse panicles, these breaking away at maturity, becoming tumbleweeds; spikelets on slender pedicels; first glume minute or obsolete; second glume 3- to 5-nerved, nearly as long as the 5- to 7-nerved sterile lemmas, a more or less prominent strip of appressed silky hairs down the internerves and margins of each, the sterile lemma empty or enclosing a minute nerveless rudimentary palea; fertile lemma cartilaginous, elliptic, acute, brown, the delicate hyaline margins enclosing the palea.

Leptoloma cognatum (Schult.) Chase. Fall witchgrass.

Ascending from a decumbent, knotty, often densely hairy base, often forming large bunches, pale green, leafy; culms 30-70 cm long; blades mostly less than 10 cm long, 2-6 mm wide, rather rigid; panicle one-third to half the entire height of the plant, purplish and short-exserted at maturity, very diffuse, the capillary branches soon widely spreading, pilose in the axils; the spikelets solitary on long capillary pedicels, narrowly elliptic, 2.5-3 mm long, abruptly acuminate. Dry soil and sandy fields. Coastal Plain and Fall Belt.

Lolium L. Ryegrass.

Annuals or perennials; culms erect, unbranched; spikes terminal, usually flat; spikelets several-flowered, single in alternate notches of zig-zag rachis; first glume wanting, second outward, equalling or exceeding second floret; lemmas rounded on back, obtuse, acute or awned.

- | | | |
|-----|---|-----------------------|
| 1. | Glume shorter than spikelet | 2 |
| 1'. | Glume as long or longer than spikelet | <i>L. temulentum</i> |
| 2. | Lemmas nearly or quite awnless; culms subcompressed | <i>L. perenne</i> |
| 2'. | Lemmas at least the upper, awned; culms cylindrical | <i>L. multiflorum</i> |

Lolium temulentum L. Darnel.

Annual; culms 60-90 cm tall; blades mostly 3-6 mm wide; spike strict, 15-25 cm long, glume about 2.5 cm long, as long as or longer than the 5- to 7-flowered spikelet, firm, pointed; florets plump; the lemmas as much as 8 mm long, obtuse, awned, the awn 6-12 mm long. Grainfields and waste places, Coastal Plain and Piedmont.

Lolium perenne L. Perennial ryegrass. Common darnel. English ryegrass.

Shortlived perennial; culms erect or decumbent at the commonly reddish base, 30-60 cm tall; auricles at summit of sheath, minute or obsolete; foliage glossy, the

blades 2-4 mm wide; spike often subfalcate, mostly 15-25 cm long; spikelets mostly 6- to 10-flowered; lemmas 5-7 mm long, awnless or nearly so. Meadows and waste places scattered throughout the state. Introduced from Europe.

Lolium multiflorum Lam. Italian ryegrass. Annual ryegrass.

Differing from *L. perenne* in the more robust habit, to 1 m tall, pale or yellowish at base, auricles at summit of sheaths prominent; spikelets 10- to 20-flowered, 1.5-2.5 cm long; lemmas 7-8 mm long, at least the upper awned. Meadows and waste places throughout the state. Introduced from Europe. Harvill *et al.* regard *L. multiflorum* as a synonym of *L. perenne*.

Manisuris L.

Perennial, slender, moderately tall, or tall grasses with usually numerous glabrous cylindric or flattened solitary racemes; spikelets awnless, in pairs at the nodes of a thickened articulate rachis, one sessile and perfect, the other pedicellate, rudimentary, the pedicel thickened and appressed to the rachis, the sessile spikelet fitting closely against the rachis, forming a cylindric or flattened raceme; glumes mostly obtuse, the first coriaceous, fitting over the hollow containing the spikelet, the keels winged at the summit, the second less coriaceous than the first; sterile lemma, fertile lemma and palea thin and hyaline. *Manisuris* is considered to be *Coelorachis* in Gould and Shaw (1983).

Manisurus rugosa (Nutt.) Kuntze. No common name known.

Culms mostly rather stout, 70-120 cm tall, freely branching; sheaths compressed-keeled; blades commonly folded, 3-8 mm wide; flowering branches often numerous, the racemes 4-8 cm long, partly included in brownish sheaths; rachis joint and pedicel contracted in the middle; sessile spikelet 3.5-5 mm long, the first glume strongly and irregularly transversely ridged, the keels narrowly winged toward the summit. Moist to wet pine woods, Sussex County.

Melica L. Melic grass.

Rather tall perennials; base of culm often swollen into a corm; sheaths closed, blades flat; panicles narrow; spikelets relatively large, 2- to several-flowered; glumes somewhat unequal, thin, papery, scarious-margined; lemmas convex, scarious-margined, callus not bearded.

1. Glumes nearly as long as the 2-flowered spikelets *M. mutica*
- 1'. Glumes shorter than the 3- to 5-flowered spikelets *M. nitens*

Melica mutica Walt. Two-flower melic grass.

Culms 60-100 cm tall, erect, loosely tufted; sheaths scabrous or somewhat pubescent; blades flat, 2-5 mm wide; panicle 10-20 cm long, nearly simple, with 1 to few short, spreading, few-flowered branches below; spikelets broad, pale, 7-10 mm long, usually 2-flowered, the florets spreading, pendulous on slender pedicels, pubescent at the summit, the spikelets entire; glumes nearly as long as the spikelet; lemmas scaberulous, strongly nerved, the two florets about the same height, rudiment obconic. Rich or rocky woods and thickets. Not abundant but widely distributed.

Melica nitens (Scribn.) Nutt. Three-flower melic grass.

Resembling *M. mutica*; on the average, culms taller; sheaths glabrous or scaberulous; blades 7-15 mm wide; panicle more compound with several spreading branches; glumes shorter than the usually 3-flowered narrower spikelet; apex of the

second floret a little higher than that of the first; lemmas acute; rudiment mostly minute. Rocky woods. Rare. Frederick, Roanoke and Shenandoah Counties.

Microstegium Nees.

Straggling annuals with flat lanceolate blades; spikelets in pairs, alike, perfect, on an articulate rachis, 1 sessile, 1 pedicellate; racemes 1 to several, digitate or approximate, first glume sulcate.

Microstegium vimineum (Trin.) A. Camus. No common name known.

Annual; culms slender, straggling, rooting at the nodes, 50-100 cm long, freely branching; blades lanceolate, 3-8 cm long, 5-10 mm wide; racemes 2 to 6, sometimes only 1, approximate; spikelets about 5 mm long. Shaded banks and roadsides throughout the state. Introduced from Asia.

Milium L.

Moderately tall grasses with flat blades and open panicles; spikelets 1-flowered, disarticulating above the glumes; glumes equal, obtuse, membraceous, rounded on the back; lemma a little shorter than the glumes, obtuse, obscurely nerved, rounded on the back, dorsally compressed, in fruit becoming indurate, smooth and shining, the margins enclosing the lemmas.

Milium effusum L.

Smooth perennial, somewhat succulent; culms slender, erect from a bent base, 1-1.5 m tall; blades mostly 10-20 cm long, the slender branches in remote spreading or drooping pairs or fascicles, naked below; spikelet pale, 3-3.5 mm long; glumes scaberulous. Damp or rocky woods of Augusta, Bath, Highland and Rockingham Counties.

Miscanthus Anderss.

Robust perennials with long, flat blades and terminal panicles of aggregate spreading slender racemes; spikelets all alike, in pairs, unequally pedicellate along a slender continuous rachis; glumes equal, membranaceous or somewhat coriaceous; sterile lemma a little shorter than the glumes, hyaline; fertile lemma hyaline, smaller than the sterile lemma, extending into a delicate bent and flexuous awn; palea small and hyaline.

Miscanthus sinensis Anderss. Eulalia. Chinese ornamental grass.

Culms robust in large bunches, erect, 2-3 m tall; leaves numerous, mostly basal, the blades flat, as much as 1 m long, about 1 cm wide, tapering to a slender point, the margin serrate; panicle somewhat fan-shaped, consisting of numerous silky aggregate racemes, 10-20 cm long; spikelets with a tuft of silky hairs at base surrounding them and about as long as the glumes. Cultivated for ornament and now growing wild in some localities. Scattered throughout the state. Introduced from Asia.

Muhlenbergia Schreb.

Perennial with slender root stocks and flat or rolled leaves; panicles usually narrow but dense; spikelets usually 1-flowered; glumes usually shorter than lemma, often awn-tipped; lemma narrow, awned, or awnless.

1. Rhizomes developed, usually prominent, scaly, creeping, often branching 2
- 1'. Rhizomes wanting, the culms tufted, usually erect 9
2. Panicles loosely flowered, slender, much exceeding the leaves; glumes broad below, abruptly pointed, shorter

- than body of lemma 3
- 2'. Panicles usually densely flowered, tapering from base to apex 5
3. Culms slender, rather weak, becoming much branched . . . *M. brachyphylla*
- 3'. Culms erect, simple or sparingly branched 4
4. Spikelets 1.5 - 2.5 mm long; lemma apiculate; blades commonly not more than 5 - 7 mm wide *M. sobolifera*
- 4'. Spikelets 3 - 4 mm long; lemma with an awn 2 to 5 times as long as the body; blades commonly 8 mm or more wide . . . *M. tenuiflora*
5. Glumes with stiff, scabrous awn-tips, much exceeding the awnless lemma; panicles terminal on the culm or leafy branches, compact, interrupted, bristly *M. glomerata*
- 5'. Glumes acuminate, sometimes awn-tipped but not stiff and exceeding the lemma; panicles terminal and axillary, numerous, not bristly 6
6. Culms glabrous below nodes; panicles not compact, the branches ascending; plants sprawling, top heavy, the branchlets geniculate-spreading *M. frondosa*
- 6'. Culms strigose below nodes; panicles compact or, if not, the branches erect or nearly so; plants often bushy-branching but not sprawling with geniculate branchlets . . . 7
7. Callus hairs wanting; lemma nearly smooth, awnless *M. glabriflora*
- 7'. Callus hairs present; lemma pubescent below 8
8. Panicles not compactly flowered; lemma with awn as much as 10 mm or more long; some blades 10 - 15 cm or more long *M. sylvatica*
- 8'. Panicles compactly flowered or, if not, lemmas awnless; blades commonly less than 10 cm long, but sometimes longer *M. mexicana*
9. Culms decumbent and rooting at nodes *M. schreberi*
- 9'. Culms erect or spreading, not rooting at nodes 10
10. Panicle narrow, branches floriferous from base *M. cuspidata*
- 10'. Panicle open, branches naked at base 11
11. Awn of lemma less than 5 mm long; panicle usually not more than twice as long as wide at maturity, branches and pedicels stiff *M. expansa*
- 11'. Awn of lemma usually more than 10 mm long; panicle elongate, usually at least 4 times as long as wide at maturity *M. capillaris*

Muhlenbergia brachyphylla Bush. No common name known.

Perennial, with numerous slender scaly rhizomes; culms slender, sub-erect, freely branching at the middle nodes, the branches lax, glabrous or obscurely scabrous below the nodes; blades flat, spreading, scaberulous, mostly 7-15 cm long and 3-5 mm wide; panicles on filiform peduncles, very slender, lax, relatively few-flowered, mostly 8-15 cm long; spikelets, excluding the awn, about 3 mm long; the glumes about two-thirds as long, awn-tipped; lemma minutely pubescent toward the base, tapering into a slender awn 3-6 mm long, rarely shorter. Low damp to

moist woods of Fall Belt. Harvill *et al.* regard *M. brachyphylla* as a synonym of *M. bushii* Pohl.

Muhlenbergia sobolifera (Muhl.) Trin. Branched muhly.

Perennial, with numerous creeping scaly rhizomes 2-3 mm thick; culms erect, slender, solitary or few in a tuft, glabrous, 60-100 cm tall, sparingly branching, the branches erect; blades flat, spreading, scabrous, those of the main culm 5-15 cm long, 3-8 mm wide, occasionally larger, at time of flowering aggregate along the middle part of the culm; panicle slender, somewhat nodding, mostly 5-15 cm long, the distant branches appressed, floriferous from base, overlapping or the lower more distant; spikelets mostly 2-2.5 mm long; the glumes about two-thirds as long, abruptly acuminate or awn-tipped; lemma elliptic, bluntnish, pubescent on the lower part, usually apiculate. Dry rocky woods and cliffs of Fall Belt, Piedmont and Valleys and Ridges.

Muhlenbergia tenuiflora (Willd.) B.S.P. Slender-flowered muhly.

Similar to *M. sobolifera* in habit; culms often more robust; blades mostly 10-18 cm long and 6-10 mm wide; panicles on the average longer; culms retrorsely puberulent at least around the nodes; sheaths puberulent or scaberulous toward the summit; spikelets (excluding the awns) 3-4 mm long; the glume about half as long, broad at the base, abruptly acuminate, scaberulous; lemma narrow, pubescent toward the base, tapering into a slender straight awn 3-10 mm long. Rocky woods mainly in central to western part of state.

Muhlenbergia glomerata (Willd.) Trin. No common name known.

Perennial from creeping branching scaly rhizomes; culms slender, erect or suberect, 30-90 cm tall, simple or with a few erect branches at base, the internodes minutely puberulent; sheaths rounded on the back; ligule minute; blades flat, 5-15 cm long, lax, 2-5 mm wide, ascending; panicle narrow, compact, lobed, mostly interrupted at base, often purplish, 3-10 cm long; spikelets 5-6 mm long; the narrow, attenuate subequal glumes stiffly awn-tipped; lemma about 3 mm long, pointed, pilose on the lower part. Sphagnum bogs, swamps and moist ground, Arlington, Fauquier and Page Counties.

Muhlenbergia frondosa (Poir.) Fern. Wirestem muhly.

Perennial, with creeping scaly rhizomes; culms often relatively stout, glabrous below the nodes, finally decumbent, often rooting at the geniculate lower nodes, freely branching from all the nodes (occasionally simple below), the branches ascending or somewhat spreading, the plants becoming top-heavy and bushy, 40-100 cm long; blades flat, scabrous, usually not more than 10 cm long, sometimes as much as 15 cm, 3-7 mm wide; panicles numerous, short exserted or partly included, terminal and axillary, the larger as much as 10 cm long (the axillary shorter), narrow, sometimes rather loose, the branches ascending, mostly densely flowered from the base; glumes 2-3 mm, rarely to 4 mm long, tapering into an awned tip, subequal or unequal, shorter than the floret, or the second glume exceeding it; lemmas 2-3 mm long, pointed, short-pilose at base. Thickets, low ground and waste places from the Fall Belt west in the state.

Muhlenbergia glabriflora Scribn. No common name known.

In habit resembling *M. frondosa*, freely branching; culms scaberulous below nodes as in *M. sylvatica*; blades numerous, short, narrow, appressed; panicles on

the average shorter and narrower than in *M. frondosa*, spikelets about as in *M. frondosa* but the lemma glabrous. Low woods in Brunswick Co.

Muhlenbergia sylvatica (Torr.) Torr. Woodland muhly.

Perennial with creeping scaly rhizomes, culms slender, retrorsely scaberulous below the nodes, rather sparingly branching from the middle and upper nodes, finally leaning, the subfiliform branches often elongate, drooping, the plant 40-100 cm tall; blades flat, lax, ascending to spreading, 0.5-1.8, commonly 8-15 cm long, 2-8 mm wide; panicles slender, nodding, the slender branches appressed, slightly overlapping; glumes lanceolate, acuminate or awn-tipped, 2-3 mm long; lemma slightly exceeding the glumes, pilose below, tapering into a slender awn 5-10 mm long. Moist woods and thickets scattered throughout the state.

Muhlenbergia mexicana (L.) Trin. Wirestem muhly. Mexican muhly.

Resembling *M. frondosa*, the culms erect or ascending, usually simple below, less freely branching, scaberulous below the nodes; blades lax, often 10-20 cm long, mostly 2-4 mm wide; panicles mostly long-exserted, narrow, the upper often 10-15 cm long, of numerous short appressed densely flowered somewhat aggregate branches; spikelets 2-3 mm long; glumes narrow, attenuate, awn-tipped, about equal the pointed or awn-tipped lemma; the lemma long-pilose below. Moist thickets, low woods and low open ground scattered through western part of the state.

Muhlenbergia schreberi Gmel. Nimblewill. Dropseed.

Culms slender, branching, spreading and decumbent at base, usually rooting at the lower nodes, but not forming definite creeping rhizomes, the flowering branches ascending, 10-30 cm long; blades flat, mostly less than 5 cm long, and 2-4 mm wide; panicles terminal and axillary, slender, loosely flowered, lax, nodding, 5-15 cm long; glumes minute, the first often obsolete, the second rounded, 0.1-0.2 mm long; lemma narrow, somewhat pubescent around the base, the body about 2 mm long, the slender awn 2-5 mm long. In spring and early summer the culms are short and erect with spreading blades, the plants being very different in appearance from the flowering phase of fall. Damp shady places scattered throughout the state.

Muhlenbergia cuspidata (Torr.) Rydb. Plains muhly.

Culms slender, wiry, 20-40 cm tall, erect, in dense tufts with hard, bulblike scaly bases; ligule minute; blades flat or loosely involute, erect or ascending, 1-2 mm wide; panicle narrow, somewhat spikelike, 5-10 cm long, the short branches appressed; spikelets about 3 mm long; glumes subequal, acuminate-cuspidate, about two-thirds as long as the spikelet; lemma acuminate-cuspidate, minutely pubescent. Gravelly or stony slopes, southwestern part of the state.

Muhlenbergia expansa (DC) Trin. No common name known.

Resembling *M. capillaris*, in denser tufts, the old basal sheaths forming a curly fibrous mass; blades narrow, flat, becoming involute; panicle relatively smaller, narrower, the capillary branches and branchlets mostly straight; spikelets 3.5-5 mm long; the glumes one-third to two-thirds as long, acute to acuminate; lemma scaberulous, nearly glabrous at base, awnless or with an awn 2-3 mm long, rarely longer. Moist pine barrens near the coast, Greenville County.

Muhlenbergia capillaris (Lam.) Trin. No common name known.

Perennial, in tufts; culms rather slender, erect, 60-100 cm tall; sheaths scaberulous, at least toward the summit, and with auricles mostly 3-5 mm long;

blades elongate, flat or involute, 1-4 mm wide, those of the innovations narrower, involute; panicle purple, oblong, diffuse, one-third to half the entire height of the culm, the branchlets and pedicels finally spreading; spikelets, excluding awns, 3-4 mm long; the glumes one-fourth to two-thirds as long, acute, the second often short-awned; lemma scaberulous, minutely hairy on the callus and with a delicate awn 5-15 mm long. Rocky or sandy open woods mostly in the Piedmont.

Oryzopsis Michx. Ricegrass. Mountain rice.

Mostly slender perennials with flat or often involute blades and terminal narrow or open panicles; spikelets 1-flowered, disarticulating above the glumes; glumes about equal, obtuse to acuminate; lemma indurate, usually about as long as the glumes, broad, oval or oblong, nearly terete, usually pubescent, with a short blunt, oblique callus, and a short, deciduous, sometimes bent and twisted awn; palea enclosed by the edges of the lemma.

Oryzopsis racemosa (J. E. Smith) Ricker. No common name known.

Culms tufted, from a knotty rhizome, erect, 30-100 cm tall; culm leaves several, the lowermost blades reduced, the others elongate, 5-15 mm wide, flat, tapering at both ends, rather thin, scabrous above, pubescent beneath; panicle 10-20 cm long, the branches distant, the lower spreading or reflexed at maturity, bearing a few spikelets toward the end; glumes 7-9 mm long, about 7-nerved, abruptly acuminate; lemmas slightly shorter than the glumes, sparsely pubescent, nearly black at maturity, the awn 1.5-2.5 cm long, slightly flexuous. In rocky areas under partial shade. Valleys and Ridges.

The eighth edition of Gray's Manual records *O. asperifolia* Michx. (Mountain rice) as occurring in Virginia. It differs from *O. racemosa* in having elongate basal blades and uppermost not more than 1 cm long.

Panicum L. Panicum

Annuals or perennials of various habit; usually no basal rosette formed; insufficient lateral branching to alter overall appearance; leaf blades with pronounced ribs and furrows on both sides; basal leaves similar to culm leaves; ligule a fringed or glabrous membrane, a fringe of hairs or absent; inflorescence an open or contracted panicle; spikelets all fertile.

- 1. Plants annual 2
- 1'. Plants perennial 8
- 2. Inflorescence of several more or less secund spikelike racemes; fruit transversely rugose *P. racemosum*
- 2'. Inflorescence a more or less diffuse panicle 3
- 3. Spikelets tuberculate *P. verrucosum*
- 3'. Spikelets not tuberculate 4
- 4. First glume not more than one-fourth the length of the spikelet, truncate or triangular-tipped *P. dichotomiflorum*
- 4'. First glume usually as much as half the length of the spikelet, acute or acuminate 5
- 5. Panicles drooping; spikelets 4.5-5 mm long *P. miliaceum*
- 5'. Panicles erect; spikelets not more than 4 mm long 6
- 6. Panicles more than half the length of the entire plant 7
- 6'. Panicles not more than one-third the entire height of the plant 8

7. Panicles narrow, usually less than half as broad as long . . . *P. flexile*
- 7'. Panicles as broad as long *P. capillare*
8. Culms relatively stout; blades about 1 cm wide;
spikelets turgid *P. gattingeri*
- 8'. Culms slender; blades not more than 6 mm wide;
spikelets not turgid *P. philadelphicum*
9. Spikelets short-pedicel along one side of the
rachises, forming spikelike racemes *P. hemitomom*
- 9'. Spikelets in open or sometimes contracted or
congested panicles 10
10. Sterile palea enlarged and indurate at maturity,
expanding the spikelet *P. hians*
- 10'. Sterile palea, if present, not enlarged 11
11. Plants with conspicuous creeping scaly rhizomes 12
- 11'. Plants without creeping scaly rhizomes 16
12. Panicle elongate, strongly contracted 13
- 12'. Panicle diffuse or only slightly contracted 14
13. Culms rarely 1 m tall, solitary from nodes of
horizontal rhizome *P. amarum*
- 13'. Culms 1-2 m tall, in dense tufts *P. amarulum*
14. Spikelets 3.5-5 mm long; culms 1-2 (-3) m tall *P. virgatum*
- 14'. Spikelets up to 3.8 mm long; culms up to 1 m tall 15
15. Panicles open; spikelets 3.4-3.8 mm long *P. anceps*
- 15'. Panicles more or less contracted; spikelets not more
than 2.8 mm long *P. rhizomatum*
16. Ligule ciliate; basal leaves half as long as culm or more;
panicle much exceeding upper leaves 17
- 16'. Ligule erose or lacerate, not ciliate; upper leaves
usually nearly equalling the terminal panicle 18
17. Spikelets up to 2.7 mm long, the first glume less than
half that length; ligule 2-3 mm long *P. longifolium*
- 17'. Spikelets 3-3.5 mm long; first glume two-thirds to
three-fourths that length; ligule less than 1 mm long *P. combsii*
18. Fruit stipitate; spikelets 2.5-2.8 mm long, conspicuously
secund *P. stipitatum*
- 18'. Fruit not stipitate; spikelets not conspicuously secund 19
19. Spikelets up to 2.2 mm long; panicle branches ascending
or spreading *P. agrostoides*
- 19'. Spikelets about 2.5 mm long; panicle branches erect or
nearly so *P. condensum*

Panicum racemosum L. Brown-top millet.

Culms erect or spreading from a decumbent base, 30-100 cm tall, sometimes pubescent below the panicle or hispid below the appressed pubescent nodes; sheaths glabrous to papillose-hispid; blades narrow, pubescent; panicles compact; raceme suberect; pedicels bristly; spikelets glabrous to finely pubescent, about 3 mm long, tawny or dull brown. Waste ground of Greensville, Lunenburg and Prince George Counties. Sometimes planted for wildlife.

Panicum verrucosum Muhl. No common name known.

Culms 20-150 cm long, slender, weak, decumbent at base, usually with stilt roots, bright green, at first erect, later widely spreading; blades thin, flat, lax, 5-20 cm long, 4-10 mm wide; panicles with divaricate capillary branches 5-30 cm long, about as wide, diffuse, small panicles often produced at lower nodes; spikelets mostly in pairs, toward the ends of the capillary branches, 1.8-2.1 mm long, elliptic-obovate, subacute, roughened with small warts. Wet, mostly shady soil in eastern part of the state.

Panicum dichotomiflorum Michx. Fall panicum.

Culms ascending or spreading from a geniculate base, 50-100 (-200) cm long; ligule a dense ring of white hairs 1-2 mm long; blades scaberulous and sometimes sparsely pilose on upper surface, 10-50 cm long, 3-20 mm wide, the white midrib usually prominent; panicles terminal and axillary, mostly included at base, 10-40 cm long or more, main branches ascending; spikelets narrowly oblong-ovate, 2-3 mm long, acute. Moist ground, along streams and a weed in waste places and cultivated soil throughout the state.

Panicum miliaceum L. Broom corn millet. Hog millet. Proso.

Culms stout, erect or decumbent at base, 20-100 cm tall; blades more or less pilose on both surfaces or glabrate, as much as 30 cm long and 2 cm wide, rounded at base; panicles usually more or less included at base, 10-30 cm long, usually nodding, rather compact, the numerous branches ascending, very scabrous, spikelet-bearing toward the ends; spikelets 4.5-5 mm long, ovate, acuminate, strongly many-nerved; first 3 mm long, stramineous to reddish brown. Waste places, introduced or escaped from cultivation.

Panicum flexile (Gattinger) Scribn. No common name known.

Culms slender, erect, much-branched from the base, 20-70 cm tall, somewhat hispid below, the nodes pubescent; blades erect but not stiff, glabrous or sparsely hispid, up to 30 cm long, 2-6 mm wide; panicle relatively few-flowered, oblong, narrow, 10-20 cm long, about one-third as wide; spikelets 3.1-3.5 mm long. Sandy, mostly damp soil, meadows and open woods scattered throughout the state.

Panicum capillare L. Witchgrass. Old witchgrass.

Culms erect or somewhat spreading at base, 20-80 cm tall, papillose-hispid to nearly glabrous; sheaths hispid; blades 10-25 cm long, 5-15 mm wide, hispid on both surfaces; panicles densely flowered, very diffuse, often half the length of the entire plant, included at the base until maturity, the branches finally divaricately spreading, the whole panicle breaking away and rolling before the wind; spikelets 2-2.5 mm long. Open ground and waste places, a weed in cultivated ground in scattered locations throughout the state.

Panicum gattingeri Nash. No common name known.

Culms at first erect, soon decumbent and rooting at the lower nodes, papillose-hispid, in robust specimens up to 1 m long; blades 6-10 mm wide, more or less hispid or nearly glabrous; panicles numerous, terminal and axillary, oval or elliptic in outline, the terminal 10-15 cm long, the lateral smaller; spikelets 2 mm long. Open ground and waste places, often a weed in cultivated soil in Arlington, Fauquier, Page, Montgomery, and Roanoke Counties.

Panicum philadelphicum Bernh. ex Trin. (= *P. tuckermani* Fern.) No common name known.

Plants light yellowish green; culms slender, usually erect, 15-50 cm tall, papillose-hispid to nearly glabrous, more or less zigzag at base; blades usually erect, 5-15 cm long, 2-6 mm wide, rather sparsely hirsute; panicles 10-20 cm long, few flowered, the branches solitary, rather stiffly ascending, the axillary pulvini hispid; spikelets 1.7-2 mm long, mostly in twos at ends of branchlets. Dry open or sandy ground scattered throughout the state.

Panicum hemitomom Schult. Maidencane.

With extensively creeping rhizomes, often producing numerous sterile shoots with overlapping, sometimes densely hirsute, sheaths; culms 50-150 cm tall, usually hard; sheaths of fertile culms usually glabrous; blades 10-25 cm long, 7-15 mm wide, usually scabrous on upper surface and smooth beneath; panicle 15-30 cm long, branches erect, the lower distant, the upper approximate, 2-10 cm long; spikelets 2.4-2.7 mm long, lanceolate, acute; first glume about half the length of the spikelet; fruit less rigid than usual in the genus, the apex of the palea scarcely enclosed. Moist soil along riverbanks and ditches, borders of lakes and ponds, often in the water, sometimes a weed in moist cultivated fields in Augusta, Isle of Wight and Sussex Counties and City of Chesapeake.

Panicum hians Ell. No common name known.

Culms 20-60 cm tall, mostly erect, sometimes more or less decumbent or prostrate with erect branches; blades 5-15 cm long, 1-5 mm wide, flat or folded, pilose on upper surface near base; panicles 5-20 cm long, usually loose and open, the primary branches few, slender, distant, spreading or drooping, the branchlets borne on the upper half or towards the ends only; spikelets in more or less secund clusters, 2.2-2.4 mm long, at maturity about twice as thick as wide. Damp soil along ponds and streams of Greensville, Southampton and Sussex Counties. Gould and Shaw regard this taxon as *Steinchisma hians* (Ell.) Nash ex Small.

Panicum amarum Ell. No common name known.

Glaucous and glabrous throughout; culms solitary from extensively creeping rhizomes, 30-100 cm tall; blades thick, 10-30 cm long, 5-12 mm wide, flat, involute toward the tip, the margins smooth; panicle one-fourth to one-third the height of the plant, not more than 3 cm wide, the branches appressed; spikelets 5-6.5 mm long, acuminate. Sandy seashores and coast dunes of Coastal Plain.

Panicum amarulum Hitchc. & Chase. No common name known.

Culms as much as 1 cm thick, in large branches as much as 1 m across, 1-2 m tall, glaucous; rhizomes vertical or ascending; blades 20-50 cm long, 5-12 mm wide, more or less involute, pilose on the upper surface near base; panicle large, rather compact, 5-10 cm wide, slightly nodding, densely flowered; spikelets 4.3-5.5 mm long, acuminate. Sandy shores and coast dunes of Accomack and Northampton Counties and Cities of Virginia Beach and Newport News.

Panicum virgatum L. Switchgrass.

Plants usually in large tufts, green or glaucous, with numerous scaly creeping rhizomes; culms erect, tough and hard, 1-2 (-3) m tall; sheaths glabrous; blades 10-60 cm long, 3-5 mm wide, flat, glabrous, or sometimes pilose above near base, rarely pilose all over; panicle 15-50 cm long, open, sometimes diffuse; spikelets 3.5-5 mm long, acuminate; first glumes clasping, two-thirds to three-fourths as long as spikelet, acuminate or cuspidate; fruit narrowly ovate, the margins of the lemma

inrolled only at base. Prairies and open ground, open woods, and brackish marshes mostly in eastern and northern part of the state.

Panicum anceps Michx. No common name known.

Culms 50-100 cm tall, with numerous scaly rhizomes; sheaths glabrous or pilose; blades elongate, 4-12 mm wide, pilose above near base; panicles 15-40 cm long, the slender, remote branches somewhat spreading, bearing short mostly appressed branchlets with rather crowded somewhat curved subsecund spikelets, set obliquely on their pedicels; spikelets 3.4-3.8 mm long. Moist sandy soil throughout the state.

Panicum rhizomatum Hitchc. & Chase. No common name known.

Resembling *P. anceps*; culms less robust, the rhizomes more slender and numerous; sheaths densely to sparsely villose, especially at the summit; blades usually pubescent on both surfaces; panicles more or less contracted; spikelets 2.4-2.8 mm long. Moist sandy woods and savannas of Northampton, Southampton, and Dinwiddie Counties and Cities of Norfolk and Virginia Beach.

Panicum longifolium Torr. No common name known.

Culms rather slender, 35-80 cm tall, in dense tufts, usually surrounded by basal leaves nearly half as long; sheaths usually villose near summit; ligule fimbriate-ciliate, 2-3 mm long; blades elongate, 2-5 mm wide, pilose on upper surface near base; lateral panicles few or none, the terminal 10-25 cm long, the branches slender, ascending; spikelets 2.4-2.7 mm long. Moist sandy ground of Augusta County and Coastal Plain.

Panicum combsii Scribn. & Ball. No common name known.

Resembling *P. longifolium*; sheaths glabrous or nearly so; ligule less than 1 mm long; blades on the average shorter; spikelets 3-3.5 mm long, acuminate. Margins of ponds and wet woods, City of Virginia Beach.

Panicum stipitatum Nash. No common name known.

Resembling *P. agrostoides*; often purple-tinged throughout, especially the panicles; sheaths much overlapping, the blades usually equalling or exceeding the terminal panicle; panicles usually several to a culm, 10-20 cm long, narrow, densely flowered, the numerous stiff branches ascending, with numerous divaricate branchlets, mostly on lower side; spikelets 2.5-2.8 mm long, often curved at the tip. Moist soil of Accomack, Arlington, Fairfax, Fauquier, Northampton, Roanoke and Shenandoah Counties.

Panicum agrostoides Spreng. No common name known.

In dense clumps from a short crown, with numerous shortleaved innovations at base; culms 50-100 cm tall; blades erect, folded at base, flat above, 20-50 cm long, 5-12 mm wide; panicles terminal and axillary, 10-30 cm long, half to two-thirds as wide, sometimes more diffuse, the densely flowered branchlets mostly on the underside of the branches, the pedicels usually bearing at the summit one to several delicate hairs; spikelets about 2 mm long. Wet meadows and shores of Accomack, Augusta, Charles City, James City, Northampton, Shenandoah, Southampton and York Counties and the City of Virginia Beach. Harvill *et al.* (1986) list this as *P. rigidulum* Nees.

Panicum condensum Nash. No common name known.

Resembling *P. agrostoides*; culms on the average taller; blades often sparsely pilose on the upper side at the folded base; panicles 10-25 cm long, rarely more

than 5 cm wide, the long branches erect, naked at base, with appressed branchlets bearing crowded spikelets, the pedicels not pilose; spikelets 2.2-2.5 mm long. Borders of streams and ponds and in wet places in Arlington, James City, Stafford and York Counties and City of Virginia Beach.

Parapholis C. E. Hubb.

Low annuals, with slender, cylindric spikes; spikelets 1- or 2-flowered, embedded in the cylindric articulate rachis and falling attached to the joints; glumes 2, placed in front of the spikelet and enclosing it, coriaceous, 5-nerved, acute, symmetric, appearing like halves of a single split glume; lemma with its back to the rachis, smaller than the glumes, hyaline, 1-nerved; palea a little shorter than the lemma, hyaline.

Parapholis incurva (L.) C. E. Hubb. Sickle grass.

Culms tufted, decumbent at base, 10-20 cm tall; blades short, narrow; spike 7-10 cm long, cylindric, curved; spikelets 7 mm long, pointed. Mud flats and salt marshes along the coast on the Eastern Shore.

Paspalum L.

Perennial or annual; inflorescence of one or more racemes borne at summit of culm or in axils of uppermost leaves; spikelets one-flowered, plano-convex, in two rows on one side of elongated rachis; first glume usually absent; lemma and palea hardened; back of fertile lemma against rachis.

1. Rachis foliaceous, broad and winged 2
- 1'. Rachis not foliaceous nor winged 3
2. Racemes falling from the axis, rachis extending beyond uppermost spikelets *P. fluitans*
- 2'. Racemes persistent on axis; rachis with a spikelet at apex *P. dissectum*
3. Racemes 2, conjugate or nearly so at summit of culm, rarely a third below 4
- 3'. Racemes 1 to many, racemose on axis, not conjugate 5
4. Spikelets elliptic to narrowly ovate *P. distichum*
- 4'. Spikelets suborbicular, broadly ovate or obovate *P. notatum*
5. First glume developed on at least one of the pair of spikelets *P. bifidum*
- 5'. First glume normally wanting 6
6. Racemes terminal and axillary 7
- 6'. Racemes terminal on primary culm on leafy branches, no truly axillary racemes 13
7. Spikelets usually 1.5-1.7 mm long, not more than 1.8 or 1.9 mm long 8
- 7'. Spikelets 2-2.5 mm long (1.8-1.9 mm in *P. ciliatifolium*) 10
8. Blades conspicuously ciliate, otherwise nearly glabrous *P. longepedunculatum*
- 8'. Blades and sheaths conspicuously pubescent throughout 9
9. Culms slender, erect or suberect; foliage not aggregate at base; blades suberect, usually not more than 5 mm wide *P. setaceum*

- 9'. Culms stouter, mostly spreading, foliage more or less aggregate at base; blades spreading, usually more than 5 mm wide *P. debile*
10. Foliage, except margins, glabrous or nearly so *P. ciliatifolium*
- 10'. Foliage conspicuously pubescent 11
11. Culms erect or nearly so *P. pubescens*
- 11'. Culms widely spreading or prostrate 12
12. Foliage coarsely hirsute; culms relatively stout, widely spreading *P. supinum*
- 12'. Foliage finely puberulent; culms usually prostrate in dense grayish-olivaceous mats *P. psammophilum*
13. Spikelets conspicuously silky-ciliate around margin 14
- 13'. Spikelets not ciliate 15
14. Racemes commonly 3 to 5; culms geniculate at base *P. dilatatum*
- 14'. Racemes commonly 12 to 18, culms erect *P. urvillei*
15. Fruit dark brown and shining *P. boscianum*
- 15'. Fruit pale to stramineous 16
16. Plants robust, 1-2 m tall *P. floridanum*
- 16'. Plants not robust, if more than 1 m tall, culms relatively slender 17
17. Spikelets suborbicular or broadly obovate or broadly oval 18
- 17'. Spikelets elliptic to oval or obovate *P. pubiflorum*
18. Spikelets solitary; glume and sterile lemma firm 19
- 18'. Spikelets paired and solitary in same raceme 21
19. Spikelets orbicular, 3-3.2 mm long, scarcely one-third as thick, blades usually equalling base of panicle or overtopping it *P. circulare*
- 19'. Spikelets longer than broad, more than one-third as thick, panicle usually much exceeding blades 20
20. Sheaths and blades most conspicuously pilose *P. longipilum*
- 20'. Sheaths and blades from glabrous to sparsely pilose *P. laeve*
21. Spikelets 2.2-2.5 mm long; foliage not conspicuously villose *P. praecox*
- 21'. Spikelets 2.7-3.4 mm long; lower sheaths and blades mostly conspicuously villose at least at base *P. lentiferum*

Paspalum fluitans (Ell.) Kunth. Water paspalum.

Annual aquatic; culms mostly submerged, rooting at the nodes, 30-100 cm long; sheaths glabrous or pilose, with an erect auricle 1-5 mm long on each side, the sheaths of the floating branches inflated, commonly long-hirsute and purple-spotted; blades usually 10-20 cm long, 10-15 mm wide (sometimes 25 cm long and 2.5 cm wide); panicles mostly 10-15 cm long, of numerous ascending, spreading or recurved racemes, 3-8 cm long, falling entire, the rachis 1.3-2 mm wide; spikelets solitary, elliptic, 1.3-1.8 mm long, acute or acuminate, pilose with delicate hairs, sometimes obscurely so, the sterile lemma with a V-shaped pink marking at base.

Floating in sluggish streams or standing water or creeping in wet places of Brunswick, Chesterfield, Cumberland, Fairfax and Southampton Counties.

Paspalum dissectum (L.) L. No common name known.

Glabrous, olive green, creeping, freely branching, the flowering branches ascending, 20-64 cm long; blades thin, 3-6 cm long, 4-5 mm wide; panicles terminal and axillary, the racemes 2 to 4, usually erect, 2-3 cm long; rachis 2-3 mm wide; spikelets solitary, obovate, subacute, 2 mm long. In muddy and sandy banks of ponds and ditches or in shallow water of Coastal Plain.

Paspalum distichum L. Knotgrass.

Flowering culms 8-60 cm tall; sheaths usually overlapping; sometimes with extensively creeping stolons with pubescent nodes; blades 2.5-15 cm long, 3-8 mm wide, tapering to an involute apex; racemes 2-7 cm long, commonly incurved; spikelets 2.5-3.5 mm long, elliptic, abruptly acute, pale green; first glume frequently well developed, second glume appressed-pubescent, the midnerve in glume and sterile lemma well developed. Ditches and wet, rarely brackish places. Isle of Wight County, Cities of Chesapeake, Suffolk, and Virginia Beach.

Paspalum notatum Flügge. Bahia grass.

Culms 15-50 cm tall from a short, stout, woody, horizontal rhizome; blades flat or folded; racemes recurved-ascending, usually 4-7 cm long; spikelets ovate to obovate, 3-3.5 mm long, smooth and shining. Introduced and sometimes cultivated.

Paspalum bifidum (Bertol.) Nash. No common name known.

Culms erect from short rhizomes, 50-120 cm tall; blades flat, 10-50 cm long, 3-14 mm wide, villose to nearly glabrous; racemes usually 3 or 4, at first erect, 4-16 cm long; rachis slender, subflexuous; spikelets distant to irregularly approximate, elliptic-obovate, 3.3-4 mm (rarely to 4.2 mm) long; second glume and sterile lemma conspicuously nerved. Sandy pine and oak woods, occasionally in hammocks, nowhere common, on the Coastal Plain.

Paspalum longepedunculatum LeConte. No common name known.

Culms slender, ascending or suberect, 25-80 cm tall; leaves mostly aggregate at the base, the sheaths ciliate on the margin; blades usually folded at base, 4-10 cm long, rarely longer, 3-8 mm wide, stiffly papillose-ciliate on the margin, the hairs 1.5-3 mm long; racemes on very slender finally elongate peduncles, 1 or 2, rarely 3 on the primary, 1 on the axillary peduncles; racemes arching, 3-8 cm long; spikelets about 1.5 mm long, elliptic-obovate, glabrous. Sandy soil, mostly in low pine land or flat woods.

Paspalum setaceum Michx. Thin paspalum.

Culms slender, erect, usually 30-50 cm tall; sheaths pilose; blades rather firm, erect or nearly so, linear, about 10-12 cm long, 2-6 mm wide, densely pilose on both surfaces and papillose-ciliate on the margin; racemes on slender peduncles, solitary or sometimes 2, arching, 5-7 cm long; spikelets elliptic-obovate, about 1.5 mm long, glabrous or minutely pubescent. Sandy soil, usually open woods, mostly on or near the Coastal Plain.

Paspalum debile Michx. No common name known.

Differing from *P. setaceum* in the stouter, more spreading culms, the foliage more crowded at the base, densely grayish villose, the blades on the average wider, racemes more commonly 2; spikelets 1.8-1.9 mm long, pubescent. Sandy, mostly dry soil, barrens and flat woods.

Paspalum ciliatifolium Michx. Fringeleaf paspalum.

Culms erect to spreading, 35-90 cm tall; sheaths glabrous or the lower puberulent; blades 10-35 cm long, 7-20 mm wide (rarely larger), usually strong ciliate along the margin and glabrous otherwise; racemes 1 to 3, usually 7-10 cm long; spikelets about 2 mm long, suborbicular, the glumes often minutely pubescent. Mostly sandy, open ground or open woods.

Paspalum pubescens Muhl. Hairy paspalum.

Culms ascending, 45-90 cm tall, often pilose at the summit; sheaths usually pilose toward the summit, blades 8-20 cm long, 2-10 mm wide (rarely larger), pilose on both surfaces; racemes 1 to 3, 4-17 cm long; spikelets about 2 mm long, suborbicular, usually glabrous. Open ground or open woods, common in old fields and pastures, especially in sandy regions.

Paspalum supinum Bosc ex Poir. No common name known.

Culms relatively stout, widely spreading, 30-90 cm tall; sheaths usually hirsute; blades 15-25 cm long, 8-15 mm wide, hirsute; racemes usually 2 to 4, rarely to 6, 4-10 cm long; spikelets elliptic-obovate, 2 mm long, glabrous, or the glume minutely pubescent. Dry, sandy open ground and old fields of the Coastal Plain.

Paspalum psammophilum Nash. No common name known.

Forming dense grayish-olivaceous mats, the culms usually prostrate, 25-100 cm long; sheaths appressed-pubescent; blades 4-16 cm long, 4-11 mm wide, densely appressed-pubescent; racemes 1 to 3, commonly 2, 4-9 cm long, the axillary ones wholly or partially included in the sheaths; spikelets suborbicular, 2 mm long, the glume densely pubescent. Dry sandy soil, mostly near the coast, Arlington and James City Counties.

Paspalum dilatatum Poir. Dallis grass. Paspalum-grass. Water-paspalum. Water grass. Paspalum.

Culms tufted, leafy at base, mostly 50-150 cm tall, ascending or erect from a decumbent base; blades 10-25 cm long, 3-12 mm wide, racemes usually 3 to 5, spreading, 6-8 cm long; spikelets ovate-pointed, 3-3.5 mm long, fringed with long white silky hairs and sparsely silky on the surface. In low ground, from rather dry prairie to marshy meadows. Often used in pastures. General, especially in the Piedmont. Introduced from Uruguay or Argentina.

Paspalum urvillei Steud. Vasey grass. Vaseygrass.

Culms in large clumps, erect, mostly 1-2 m tall; lower sheaths coarsely hirsute or occasionally glabrous; blades mostly elongate, 3-15 mm wide, pilose at base; panicle erect, 10-40 cm long, of about 12 to 20 rather crowded, ascending racemes, 7-14 cm long; spikelets 2.2-2.7 mm long, ovate, pointed, fringed with long white silky hairs, the glume appressed-silky. Along ditches and roadsides and in wasteground, mostly in rather moist soil of Coastal Plain and Piedmont. Introduced from South America.

Paspalum boscianum Flügge. Bull paspalum.

Rather succulent annual, branching at base and commonly from the middle nodes, usually conspicuously brownish purple, glabrous as a whole; culms 40-60 cm long, ascending or widely spreading; sheaths broad, loose; blades 10-14 cm long, 8-15 mm wide, papillose-pilose on upper surface near base; racemes 4 to 12, usually 4-7 cm long; rachis 2-2.5 mm wide; spikelets crowded, obovate-orbicular, 2-2.2 mm long, glabrous, rust brown at maturity. Moist or wet open ground, along ditches

and ponds, sometimes a weed in cultivated fields mostly in the Coastal Plain but also Fall Belt and Piedmont.

Paspalum floridanum Michx. Florida paspalum.

Culms solitary or few from short stout scaly rhizomes, 1-2 m tall, sheaths villose to nearly glabrous, blades firm, flat or folded, 15-50 cm long, 4-10 mm wide, usually villose at least on the upper surface toward base; racemes usually 2 to 5, 4-12 cm long; spikelets crowded, oval, about 4 mm long. Low moist sandy soil, pine woods, flatwoods, savannas of Coastal Plain and Piedmont.

Paspalum pubiflorum Rupr. ex Fourn. Hairyseed paspalum.

Culms decumbent at base, 40-100 cm tall, sheaths, at least the lower, sparsely papillose-pilose, blades flat, usually 10-15 cm long, 6-14 mm wide, usually with a few stiff hairs at the rounded base; racemes mostly 3 to 5, 2-10 cm long, rather thick, erect to spreading, the rachis 1.2-2 mm wide; spikelets obovate, pubescent, about 3 mm long. Moist open ground, banks, low woods, along streams scattered throughout the state.

Paspalum circulare Nash. No common name known.

Culms in dense leafy clumps, 30-80 cm tall; sheaths pilose to nearly glabrous; blades mostly erect, commonly about equalling the inflorescence, 15-30 cm long, 5-10 mm wide, usually pilose on upper surface; racemes 2 to 7, mostly suberect, 5-12 cm long; spikelets nearly orbicular, about 3 mm long. Fields, meadows and open waste ground scattered throughout the state.

Paspalum longipilum Nash. Long-haired paspalum.

Similar to *P. laeve*, usually less leafy at base, sheaths and blades pilose; racemes somewhat more lax than in *P. laeve*. Dry, mostly sandy soil, savannas, open woods and wet pine barrens of Coastal Plain, Fall Belt and Piedmont.

Paspalum laeve Michx. Smooth paspalum. Field paspalum.

Culms erect or ascending, leafy at base, 40-100 cm tall; sheaths keeled, glabrous or nearly so; blades usually folded at base, flat or folded above, 5-30 cm long, 3-10 mm wide, glabrous to ciliate or sparsely pilose on upper surface or sometimes toward base beneath; racemes usually 3 or 4, spreading, 3-10 cm long; spikelets broadly oval, 2.5-3 mm long. Meadows, old fields, open woods and waste ground throughout the state.

Paspalum praecox Walt. No common name known.

Culms erect from short scaly rhizomes, 50-100 cm tall; sheaths keeled, glabrous, or the lower villose; blades 15-25 cm long, 3-7 mm wide, glabrous or nearly so; racemes usually 4 to 6, ascending to arcuate-spreading, 2-7 cm long, the common axis very slender; rachis about 1.5 mm wide, purplish; spikelets usually solitary and paired in each raceme, strongly flattened, suborbicular, 2.2-2.8 mm long, the glume and sterile lemma thin and fragile. Wet pine barrens, borders of cypress swamps, moist places in flat woods of Greensville and Sussex Counties, City of Suffolk.

Paspalum lentiferum Lam. No common name known.

Similar to *P. praecox*; culms more robust, sometimes as much as 150 cm tall, sheaths less strongly keeled; blades usually more or less pilose; racemes usually 4 or 5; spikelets 2.7-3.4 mm long, broadly oval. Moist pine barrens, borders of flatwoods and cypress swamps of Greensville and Sussex Counties.

Pennisetum Rich.

Annuals or perennials, often branched, with usually flat blades and dense spikelike panicles; spikelets solitary or in groups of 2 or 3, surrounded by an involucre of bristles, these not united except at the very base, often plumose, falling attached to the spikelets; first glume shorter than the spikelet, sometimes minute or wanting; second glume shorter than or equalling the sterile lemma; fertile lemma chartaceous, smooth, margin thin and enclosing palea.

Pennisetum glaucum (L.) R. Br. Pearl millet. Cattail millet. Bullrush millet.

Annual, culms robust, up to 2 m tall, densely villose below panicle; blades flat, cordate, up to 1 m long and 5 cm wide; panicle cylindric, stiff, very dense, up to 40 - 50 cm long and 2 - 2.5 cm thick, pale, bluish-tinged, or sometimes tawny, the stout axis densely villose; spikelets short-pedicelated, 2 in a peduncled fascicle, 3.5-4.5 mm long, obovate, turgid, the mature grain protruding from the hairy-margined palea and lemma. Cultivated since prehistoric times for human food and forage. Prince Edward County

Phalaris L. Canary grass.

Annuals or perennials, with numerous flat blades and narrow or spikelike panicles; spikelets laterally compressed, with 1 terminal perfect floret and 2 sterile lemmas below, the rachilla disarticulating above the glumes, the usually inconspicuous sterile lemmas falling closely appressed to the fertile floret; glumes equal, boat-shaped, often winged on the keel; sterile lemmas reduced to 2 small, usually minute scales, fertile lemma coriaceous, shorter than glumes, enclosing the faintly 2-nerved palea.

1. Plants perennial *P. arundinacea*
- 1'. Plants annual 2
2. Glumes broadly winged; panicle ovate or short-oblong . . . *P. canariensis*
- 2'. Glumes wingless or nearly so; panicles oblong or linear . . . *P. caroliniana*

Phalaris arundinacea L. Reed canary grass.

Perennial, with creeping rhizomes, glaucous; culms erect, 60-150 cm tall; panicle 7-18 cm long, narrow, the branches spreading during anthesis, the lower as much as 5 cm long; glumes about 5 mm long, narrow, acute, the keel scabrous, very narrowly winged; fertile lemma lanceolate, 4 mm long, with a few appressed hairs, sterile lemmas villose, 1 mm long. Marshes, riverbanks, and moist places, Blue Ridge and Ridges and Valleys.

Phalaris canariensis L. Canary grass.

Annual; culms erect, 30-60 cm tall; panicle ovate to oblong-ovate, dense, 1.5-4 cm long; spikelets broad, imbricate, pale with green stripes; glumes 7-8 mm long, abruptly pointed, the green keel with a prominent pale wing, broadened upward; fertile lemma 5-6 mm long, acute, densely appressed; sterile lemmas at least half as long as fertile. Waste places of Coastal Plain, Blue Ridge, Alleghany Valleys and Ridges. This is the canary seed of commerce.

Phalaris caroliniana Walt. Carolina canary grass.

Annual; culms erect, 30-60 or more tall; panicle oblong, 2-6 cm long, occasionally longer, tapering to each end; glumes 5-6 mm long, rather abruptly narrowed to an acute apex, the keel scabrous and narrowly winged above from below the middle; fertile lemma lanceolate, acute, appressed-pubescent, about 3.5-4 mm long; the sterile lemma one-third to half as long. Old fields, sandy soil and moist places, Coastal Plain.

Phleum L. Timothy.

Annuals or perennials with erect culms, flat blades, and dense, cylindrical panicles; spikelets 1-flowered, laterally compressed, disarticulating above the glumes; glumes equal, membranaceous, keeled, abruptly mucronate or awned or gradually acute; lemma shorter than glumes, hyaline, broadly truncate, 3- to 5-nerved; palea narrow, nearly as long as lemma.

Phleum pratense L. Timothy. Herd's grass. Cat's tail.

Culms 50-100 cm tall, from a swollen or bulb-like base, forming large clumps; blades elongate, mostly 5-18 mm wide; panicle cylindrical, usually 5-10 cm long, spikelets crowded, spreading; glumes about 3.5 mm long, truncate with a stout awn 1 mm long, pectinate-ciliate on keel. Planted for hay especially in Piedmont and Mountains but escaped from cultivation along roadsides and in fields and waste places. Native of Eurasia.

Phragmites Trin.

Perennial reeds with broad, flat, linear blades and large terminal panicles; spikelets several-flowered, the rachilla clothed with long silky hairs, disarticulating above glumes and at base of each segment between florets, the lowest floret staminate or neuter; glumes 3-nerved or the upper 5-nerved, lanceolate, acute, unequal, the first about half as long as the upper, the second shorter than the florets; lemmas narrow, long-acuminate, glabrous, 3-nerved, the florets successively smaller, the summits of all about equal; palea much shorter than lemma.

Phragmites communis Trin. (= *P. australis* (Cav.) Trin. ex Steud.) Common reed.

Culms erect, 2-4 m tall with stout creeping rhizomes and often also with stolons; blades flat, 1-5 cm wide; panicle tawny or purplish, 15-40 cm long, the branches ascending, rather densely flowered; spikelets 12-15 mm long, the florets exceeded by the hairs of the rachilla. Marshes, banks of lakes and streams, and around springs, Fall Belt, Coastal Plain and Piedmont.

Poa L. Bluegrass

Low or rather tall slender annuals or usually perennials with spikelets in open or contracted panicle, the relatively narrow blades flat, folded or involute, ending in a boat-shaped tip; spikelets 2- to several-flowered, the rachilla disarticulating above glumes and between florets, the uppermost floret reduced or rudimentary; glumes acute, keeled, somewhat unequal, the first usually 1-nerved, the second usually 3-nerved; lemmas somewhat keeled, acute or acutish, rarely obtuse, awnless, membranaceous, often somewhat scarious at the summit, 5-nerved (the pair between the keel and marginal nerves rarely obsolete), nerves sometimes pubescent, callus or base of lemma in many species with scant to copious cottony hairs termed "web".

- | | |
|---|-----------------------|
| 1. Plants annual | 2 |
| 1'. Plants perennial | 3 |
| 2. Lemmas with webby hairs at base, distinctly 3-nerved,
intermediate nerves obscure; anthers 0.1 to 0.2 mm long | <i>P. chapmaniana</i> |
| 2'. Lemmas not webbed at base, distinctly 5-nerved,
anthers 0.5 to 1 mm long | <i>P. annua</i> |
| 3. Creeping rhizomes present | 4 |
| 3'. Creeping rhizomes wanting | 7 |

4. Culms strongly flattened, 2-edged *P. compressa*
 4'. Culms terete or slightly, flattened, not 2-edged 5
 5. Plants dioecious *P. arachnifera*
 5'. Plants not dioecious, florets perfect 6
 6. Lower panicle branches in a whorl of usually 5;
 blades mostly shorter than culm *P. pratensis*
 6'. Lower panicle branches usually in twos, spreading,
 spikelet-bearing near the ends, blades about as
 long as culm *P. cuspidata*
 7. Lemmas webbed at base 8
 7'. Lemmas not webbed at base *P. autumnalis*
 8. Lemmas glabrous, or keel sometimes pubescent 9
 8'. Lemmas pubescent on keel and marginal nerves 12
 9. Sheaths retrorsely scabrous *P. trivialis*
 9'. Sheaths glabrous 10
 10. Lemma villose on keel; panicle branches mostly in fours
 and fives *P. alsodes*
 10'. Lemmas glabrous on keel; panicle branches mostly in
 twos or threes 11
 11. Lemmas obtuse *P. languida*
 11'. Lemmas acute *P. saltuensis*
 12. Lower panicle branches distinctly reflexed at maturity *P. sylvestris*
 12'. Lower panicle branches not reflexed 13
 13. Intermediate nerves of lemma distinct *P. wolfii*
 13'. Intermediate nerves of lemma obscure 14
 14. Florets usually converted into bulblets with dark
 purple base; culms swollen and bulblike at base *P. bulbosa*
 14'. Florets normal; culms not bulblike at base 15
 15. Glumes narrow, acuminate, about as long as first lemma;
 ligule very short *P. nemoralis*
 15'. Glumes lanceolate, acute, shorter than first
 lemma; ligules rather prominent, those of the culm
 leaves 1-3 mm or more long *P. palustris*
Poa chapmaniana Scribn. No common name known.

Plant drying pale to tawny; culms densely tufted, slender, 10-30 cm tall; blades 1-1.5 mm wide; panicle oblong-pyramidal, 3-8 cm long, open, the lower branches spreading; spikelets 3-4 mm long, mostly 3- to 5-flowered; glumes 2 and 2.5 mm long; lemmas about 2 mm long, webbed at base, strongly pubescent on keel and lateral nerves, intermediate nerves obscure; anthers 0.1-0.2 mm long. Open ground and cultivated fields, Coastal Plain, Piedmont.

Poa annua L. Annual bluegrass

Tufted, bright green, erect to spreading, sometimes rooting at lower nodes, usually 5-20 cm tall, sometimes taller, forming mats; culms flattened, blades soft, lax, mostly 1-3 mm wide; panicles pyramidal, open, 3-7 cm long; spikelets crowded, 3- to 6-flowered, about 4 mm long; first glume 1.5-2, second 2-2.5 mm long; lemmas not webbed at base, distinctly 5-nerved, more or less pubescent on lower half of all nerves, the long hairs on lower part of keel sometimes simulating a web; anthers 0.5-1

mm long. Introduced from Europe. Open ground, lawns, pastures, waste places and openings in woods throughout the state.

Poa compressa L. Canada bluegrass

Culms solitary or few together, often gregarious, strongly flattened, wiry, decumbent at base, bluish green, 15-70 cm tall; blades mostly short, 1-4 mm wide; panicle narrow, 3-10 cm long, the usually short branches in pairs, spikelet-bearing to the base; spikelets crowded, subsessile, 3- to 6-flowered, 4-6 mm long; glumes 2-3 mm long; lemmas firm, 2-3 mm long, the web at base scant or wanting, keel and marginal nerves slightly pubescent toward base, intermediate nerves obscure. Introduced from Europe. Open ground, open woods, meadows and waste places throughout the state.

Poa arachnifera Torr. Texas bluegrass.

Plants dioecious; culms tufted, 30-75 cm tall; blades mostly 2-4 mm wide, scabrous above; panicle narrow, compact, more or less lobed or interrupted, 5-12 cm long; spikelets mostly 5- to 10-flowered, the pistillate conspicuously cobwebby, the lemmas 5-6 mm long, acuminate, copiously long webby at base, the strongly compressed keel and lateral nerves ciliate-fringed along lower half; staminate lemmas glabrous or with a scant web at base. In fields and pastures. Infrequent in Virginia.

Poa pratensis L. Kentucky bluegrass.

Culms tufted, erect, slightly compressed, 30-100 cm tall; sheaths somewhat keeled; ligule about 2 mm long; blades soft, flat or folded, mostly 2-4 mm wide, the basal often elongated; panicle pyramidal or oblong-pyramidal, open, the lowermost branches usually in a whorl of 5, ascending or spreading, naked below, normally 1 central long one, 2 shorter lateral ones and 3 short intermediate ones; spikelets crowded, 3- to 5-flowered, 3-6 mm long; lemmas copiously webbed at base, silky pubescent on lower half or two-thirds of keel and marginal nerves, intermediate nerves distinct, glabrous. Open woods, meadows and open grounds throughout the state.

Poa cuspidata Nutt. Short-leaved bluegrass. Early bluegrass.

Culms in large lax tufts, 30-50 cm tall, scarcely longer than the basal blades; blades lax, 2-3 mm wide, abruptly cuspidate-pointed; panicle 7-12 cm long, open, the branches mostly in pairs, distant, spreading, spikelet-bearing near ends; spikelets 3- or 4-flowered; lemmas 4-6 mm long, tapering to an acute apex, webbed at base, sparingly pubescent on keel and marginal nerves, intermediate nerves glabrous, distinct. Rocky woods, woodland trails and borders throughout the state. Our earliest flowering native grass.

Poa autumnalis Muhl. ex Ell. No common name known.

Culms in rather large lax tufts, 30-60 cm tall; blades 2-3 mm wide, numerous at base; panicle 10-20 cm long, about as broad, very open, the capillary flexuous branches spreading, bearing a few spikelets near the ends; spikelets 4- to 6-flowered, about 6 mm long; lemmas oblong, obtusely rounded at the scarious-compressed apex, villose on the keel and marginal nerves, pubescent on the internerves below or sometimes nearly to apex. Moist woods mostly in eastern half of the state.

Poa trivialis L. Rough bluegrass. Rough stalked bluegrass.

Culms erect from a decumbent base, often rather lax, scabrous below panicle, 30-100 cm tall; sheaths retrorsely scabrous or scaberulous, at least toward summit; ligule 4-6 mm long; blades scabrous, 2-4 mm wide; panicle oblong, 6-15 mm long, the lower branches about 5 in a whorl; spikelets usually 2- or 3-flowered, about 3 mm long; lemma 2.5-3 mm long, glabrous except the slightly pubescent keel or lateral nerves rarely pubescent, the web at base conspicuous, the nerves prominent. Introduced from Europe. Moist places scattered throughout the state.

Poa alsodes A. Gray. No common name known.

Culms in lax tufts, 30-60 cm tall; blades thin, lax, 2-5 mm wide; panicle 10-20 cm long, very open, the slender branches in distant whorls of threes to fives, finally widely spreading, naked below, few-flowered; spikelets 2- or 3-flowered, about 5 mm long; lemmas gradually acute, webbed at base, pubescent on lower part of keel, otherwise glabrous, faintly nerved. Rich or moist woods. Alleghany Highlands.

Poa languida Hitchc. No common name known.

Culms weak, in loose tufts, 30-60 or even 100 cm tall; ligule about 1 mm long; blades lax, 2-4 mm wide; panicle nodding, 5-10 cm long, the few slender branches mostly in twos or threes, ascending, few-flowered toward the ends; spikelets 2- to 4-flowered, 3-4 mm long; lemmas 2-3 mm long, glabrous except the webbed base, oblong, rather obtuse, firm at maturity. Dry or rocky woods. Rockingham County.

Poa saltuensis Fern. & Wieg. No common name known.

Resembling *P. languida*; differing in the thinner, acute, somewhat longer lemmas. Woodland thickets, Rockbridge and Augusta Counties.

Poa sylvestris A. Gray. Sylvan bluegrass.

Culms tufted, erect, 30-100 cm tall; sheaths glabrous or rarely pubescent, the lower usually antrorsely scabrous; ligule about 1 mm long; blades lax, 2-6 mm wide; panicle erect, 10-20 cm long, much longer than wide, the slender flexuous branches spreading, usually 3 to 6 at a node, the lower usually reflexed; spikelets 2- to 4-flowered, 3-4 mm long; lemmas 2.5-3 mm long, webbed at base, pubescent on internerves. Rich, moist or rocky woods scattered throughout the state.

Poa wolfii Scribn. No common name known.

Culms tufted, erect, 40-80 cm tall; sheaths slightly scabrous; blades crowded toward base of culms, mostly 1-2 mm wide; panicle drooping, 8-15 cm long, the branches ascending, bearing a few spikelets toward the end, the lower mostly in pairs; spikelets 2- to 4-flowered, 5-6 mm long; lemmas 3.5-4.5 mm long, acute, webbed at base, pubescent on keel and marginal nerves, intermediate nerves distinct. Moist woods, Clark County.

Poa bulbosa L. Bulbous bluegrass.

Culms densely tufted, more or less bulbous at base, 30-60 cm tall; blades flat or loosely involute, 1-2 mm wide; panicle ovoid, mostly 5-8 cm long, somewhat contracted, the branches ascending or appressed, some floriferous to base; spikelets mostly proliferous, the florets converted into bulblets with a dark purple base, the bracts extending into slender green tips 5-15 mm long; unaltered spikelets about 5-flowered, apparently not perfecting seeds; lemmas 2.5 mm long, webbed at base, densely silky on keel and marginal nerves, intermediate nerves faint. Introduced from Europe. Fields and meadows, Arlington, Albermarle, Charlotte, Dinwiddie Counties and City of Chesapeake.

Poa nemoralis L. Wood bluegrass.

Culms tufted, 30-70 cm tall; ligule very short; blades rather lax about 2 mm wide; panicle 4-10 cm long, the branches spreading; spikelets 2- to 5-flowered, 3-5 mm long; glumes narrow, sharply acuminate, about as long as first floret; lemmas 2-3 mm long, sparsely webbed at base, pubescent on keel and marginal nerves, intermediate nerves obscure. Occasional in meadows, Arlington and Sussex Counties.

Poa palustris L. Fowl bluegrass.

Culms loosely tufted, glabrous, decumbent at flattened purplish base, 30-150 cm tall; sheaths keeled, sometimes scaberulous; ligule 3-5 mm long or only 1 mm long on innovations; blades 1-2 mm wide; panicle pyramidal or oblong, nodding, yellowish green or purplish, 10-30 cm long, the branches in rather distant fascicles, naked below; spikelets 2- to 4-flowered, about 4 mm long; glumes lanceolate, acute, shorter than first floret; lemmas 2.5-3 mm long, usually bronzed at tip, webbed at base, villose on keel and marginal nerves. Meadows and moist open ground, Bath, Roanoke, Prince William, Arlington, Fauquier, Montgomery Counties.

Polypogon Desf.

Usually decumbent annuals or perennials with flat scabrous blades and dense, bristly, spikelike panicles; spikelets 1-flowered, pedicel disarticulating a short distance below glumes, leaving a short-pointed callus attached; glumes equal, entire or 2-lobed, awned from tip or from between lobes, awn slender, straight; lemma much shorter than glumes, hyaline, usually bearing a slender straight awn shorter than those of the glumes.

1. Glumes slightly lobed, lobes not ciliate *P. monspeliensis*

1'. Glumes prominently lobed, lobes ciliate-fringed *P. maritimus*

Polypogon monspeliensis (L.) Desf. Rabbitfoot grass.

Annual; culms erect or decumbent at base, 15-50 cm tall; ligule 5-6 mm long; blades in average plants 4-6 mm wide; panicle dense, spikelike, 2-15 cm long, 1-2 cm wide, tawny yellow when mature; glumes hispidulous, about 2 mm long, awns 6-8 mm long; lemma smooth and shining, about half as long as glumes, the delicate awn exceeding them. Introduced from Europe. Ballast and waste places, Coastal Plain.

Polypogon maritimus Willd. No common name known.

Annual; culms 20-30 cm tall, upright or spreading; ligule as much as 6 mm long; blades usually less than 5 cm long, 2-4 mm wide; panicle mostly smaller and less dense than in *P. monspeliensis*; glumes about 2.5 mm long, hispidulous below, the deep lobes ciliate-fringed, awns 7-10 mm long, lemma awnless. Introduced from Mediterranean region. City of Virginia Beach.

Puccinellia Parl. Alkali-grass.

Low pale smooth tufted annuals or perennials with narrow to open panicles; spikelets several-flowered, usually terete or subterete, the rachilla disarticulating above glumes and between florets; glumes unequal, shorter than first lemmas, obtuse or acute, rather firm, often scarious at tip, the first 1-nerved or sometimes 3-nerved; lemmas usually firm, rounded on back, obtuse or acute, rarely acuminate, usually scarious and often erose at tip, glabrous or puberulent toward base, rarely pubescent on nerves, 5-nerved, nerves parallel, indistinct, rarely rather prominent; palea about as long as lemma or somewhat shorter.

Puccinellia fasciculata (Torr.) Bicknell. No common name known.

Apparently perennial; culms rather stout, 20-50 cm tall, sometimes taller; blades flat, folded or subinvolute, 2-4 mm wide; panicle ellipsoid, 5-15 cm long, the branches fascicled, rather stiffly ascending, some naked at base but with short basal branchlets, all rather densely flowered; spikelets 2- to 5-flowered, 3-4 mm long; glumes ovate, 1 and 1.5 mm long; lemmas 2-2.5 mm long, firm, obtuse. Salt marshes, Accomack County.

See also *Glyceria pallida* which, according to Clausen (1952), belongs in *Puccinellia*.

Sacciolepis Nash.

Annuals or perennials, usually branching, the inflorescence a dense, usually elongate, spike-like panicle; spikelets oblong-conic; first glume much shorter than spikelet; second glume broad, inflated-saccate, strongly many-nerved; sterile lemma narrower, flat, fewer nerved, its palea nearly as long, often subtending a staminate flower; fertile lemma stipitate, elliptic, chartaceous-indurate, the margins inrolled, the palea not enclosed at summit.

Sacciolepis striata (L.) Nash. American cupscale.

Perennial, glabrous, often decumbent and rooting at base; culms as much as 1-2 m tall; sheaths glabrous to more or less papillose-hirsute; blades lanceolate, 4-20 cm long; spikelets about 4 mm long. Marshes, ditches and wet places, Coastal Plain.

Schizachne Hack.

Rather tall perennial with simple culms and open, rather few-flowered panicle; spikelets several-flowered, disarticulating above glumes and between florets, rachilla glabrous; glumes unequal, 3- and 5-nerved; lemmas lanceolate, strongly 7-nerved, long-pilose on callus, awned from just below teeth of prominently bifid apex; palea with softly pubescent, thickened submarginal keels, the hairs longer toward the summit.

Schizachne purpurascens (Torr.) Swallen. False melic.

Culms erect from a loosely tufted decumbent base, 50-100 cm tall; sheaths closed; blades flat, narrowed at base, 1-5 mm wide; panicle about 10 cm long, the branches single or in pairs, more or less drooping, bearing 1 or 2 spikelets; spikelets 2-2.5 cm long; glumes purplish, less than half as long as spikelet; lemmas about 1 cm long, the awn as long as lemma or longer. Rocky woods, Highland County.

Setaria Beauv.

Annual or perennial with narrow terminal panicles, these dense and spike-like or somewhat loose and open; spikelets subtended by one to several bristles, falling free from bristles, awnless; first glume broad, usually less than half the length of the spikelet, 3- to 5-nerved; second glume and sterile lemma equal, or the glume shorter, several-nerved; fertile lemma coriaceous-indurate, transversely rugose or smooth.

1. Bristles below each spikelet numerous, at least more than 5; panicle dense, cylindrical, spike-like 2
- 1'. Bristles below each spikelet 1 to 3, or, by the abortion of the spikelets, 4 or 6; panicles not as above 3
2. Plants annual; spikelets 3 mm long; lower floret staminate, palea well developed *S. lutescens*
- 2'. Plants perennial; spikelets 2-2.5 mm long; lower floret neuter, palea reduced *S. geniculata*

3. Bristles more or less retrorsely scabrous *S. verticillata*
 - 3'. Bristles antrorsely scabrous only 4
 4. Culms as much as 3 m tall; bristles 1-2 cm long; fertile lemma smooth or nearly so *S. magna*
 - 4'. Culms mostly less than 1 m tall 5
 5. Panicle cylindric, tapering above, green; spikelets falling entire 6
 - 5'. Panicle lobed or interrupted, often large and heavy, purple or yellow; fruit deciduous from glumes and sterile lemma *S. italica*
 6. Spikelets 2-2.5 mm long; bristles 1 to 3 below each spikelet; panicle erect or somewhat nodding *S. viridis*
 - 6'. Spikelets 2.8-3 mm long; bristles 3 to 6 below each spikelet; panicle conspicuously nodding *S. faberi*
- Setaria lutescens* (Weigel) Hubb. (= *S. glauca* (L.) Beauv.) Yellow foxtail. Yellow millet. Yellow bristlegrass. Foxtail.

Annual, branching at base; culms erect to prostrate, mostly 50-100 cm tall, compressed; sheaths keeled; blades as much as 25 cm long and 1 cm wide, flat, twisted in a loose spiral, villose toward the base above; panicle dense, evenly cylindric, spikelike, yellow at maturity, mostly 5-10 cm long, about 1 cm thick, the axis densely pubescent; bristles 5 to 20 in a cluster, the longer 2 to 3 times as long as the spikelet; spikelets 3 mm long; fruit strongly rugose. A weed in cultivated soil and waste places throughout the state.

Setaria geniculata (Lam.) Beauv. Knotroot bristlegrass. Knotroot foxtail.

Resembling *S. lutescens* but perennial, producing short knotty branching rhizomes as much as 4 cm long; base of plant slender, wiry; blades mainly straight (not twisted as in *S. lutescens*); bristles yellow or purple, 1 to 3 times or even 6 times as long as the spikelet; spikelets 2-2.5 or even 3 mm long. Open ground, pastures, cultivated soil, salt marshes and moist ground. Mostly eastern half of the state.

Setaria verticillata (L.) Beauv. Bur bristlegrass. Bristly foxtail.

Annual, culm often much branched at base and geniculate-spreading, as much as 1 m long; blades flat, rather thin, scabrous and often more or less pilose, 10-20 cm long, 5-10 mm wide; panicle erect but not stiff, cylindric or somewhat tapering upward, more or less lobed or interrupted, especially toward base, 5-15 cm long, 7-15 mm wide; bristles single below each spikelet, 1 to 3 times as long as the spikelet, retrorsely scabrous; spikelets 2 mm long; fruit finely rugose. Cultivated soil and waste places in coastal swamps.

Setaria magna Griseb. Giant foxtail. Giant bristlegrass.

Annual, robust, erect; culms sparingly branching, as much as 4 m tall and 2 cm thick at base; blades flat, scabrous, as much as 50 cm long and 3.5 cm wide; panicles densely flowered, nodding, often interrupted at base, tapering at each end, as much as 50 cm long and 3 cm thick, those of the branches much smaller; bristles 1-2 cm long; spikelets about 2 mm long; fruit smooth or nearly so, brown and shining at maturity. Marshes and wet places along the coast.

Setaria viridis (L.) Beauv. Green foxtail. Green bristlegrass.

Annual, branching at base, sometimes geniculate-spreading, 20-40 cm tall or even 1 m; blades flat, usually less than 15 cm long and 1 cm wide; panicle erect or

somewhat nodding, densely flowered, green or purple, cylindric, but tapering a little at the summit, usually less than 10 cm long; bristles 1 to 3 below each spikelet, mostly 3 to 4 times their length; spikelets 2-2.5 mm long; fruit very finely rugose. Introduced from Europe. A weed in cultivated soil and waste places scattered throughout the state.

Setaria italica (L.) Beauv. Italian millet. Foxtail millet. German millet. Hungarian millet. Foxtail.

Cultivated form of *S. viridis*, more robust, with broader blades and larger lobed panicles, the fruit smooth or nearly so, shining at maturity, falling away from the remainder of the spikelets. In the larger forms the culms may be as much as 1 cm thick and the panicles as much as 30 cm long and 3 cm thick, yellow or purple, bristles from scarcely longer than the spikelets to 3 to 4 times as long; fruit tawny to red, brown or black. Adventive from East Indies. Cultivated and occasionally an escape. Scattered throughout state.

Setaria faberi Herrm. Giant foxtail. Faber's foxtail.

Similar to *S. viridis*, usually taller; blades softly pubescent to glabrescent; panicle conspicuously nodding; spikelets about 3 mm long, the second glume shorter than the more rugose fruit. Introduced from China. Becoming a weed in waste and cultivated ground. Scattered throughout state.

Sorghastrum Nash.

Perennial erect, rather tall grasses, with auricled sheaths, narrow flat blades, and narrow terminal panicles of 1- to few-jointed racemes; spikelets in pairs, one nearly terete, sessile and perfect, the other wanting, only the hairy pedicel present; glumes coriaceous, brown or yellowish, the first hirsute, the edges inflexed over the second; sterile and fertile lemmas thin and hyaline, the latter extending into a usually well-developed bent and twisted awn.

1. Awn usually 15 mm long or less, once geniculate *S. nutans*

1'. Awn 20-35 mm long, twice geniculate, twisted below second bend *S. elliotii*

Sorghastrum nutans (L.) Nash. Indian grass. Indian woodgrass.

Culms 1-2.5 m tall from short, scaly rhizomes; blades elongate, flat, mostly 5-10 mm wide, tapering to a narrow base, scabrous; panicle narrow, yellowish, rather dense, 15-30 cm long, contracted and darker at maturity; summit of branchlets, rachis joints and pedicels grayish-hirsute; spikelets 6-8 mm long, lanceolate, hirsute, the awn 1-1.5 cm long, once-geniculate. Open woods and dry slopes throughout the state.

Sorghastrum elliotii (Mohr.) Nash. Elliott's woodgrass.

Culms 1-1.5 m tall, more slender than *S. nutans*, without rhizomes; the base comparatively delicate, smooth or nearly so; blades on the average narrower; panicle loose, 15-30 cm long, nodding at apex, the filiform branchlets and pedicels flexuous but not recurved, with a few long hairs at the tip; spikelets 6-7 mm long, chestnut brown at maturity, with a short blunt bearded callus, the first glume hirsute or glabrescent on the back; awn 2.5-3.5 cm long, twice-geniculate. Open woods, dry hills, and sandy fields in eastern part of state.

Sorghum Moench.

Tall or moderately tall annuals or perennials with flat blades and terminal panicles of 1- to 5-jointed tardily disarticulating racemes; spikelets in pairs, one

sessile and fertile, the other pedicellate, sterile but well developed, usually staminate, the terminal sessile spikelet with two pedicellate spikelets.

Sorghum halepense (L.) Pers. Johnsongrass.

Perennials with culms 50-150 cm tall, from extensively creeping scaly rhizomes; blades mostly less than 2 cm wide; panicle open, 15-50 cm long; sessile spikelet 4.5-5.5 mm long, ovate, appressed-silky, the readily deciduous awn 1-1.5 cm long, geniculate, twisted below; pedicellate spikelet 5-7 mm long, lanceolate. Open ground, fields and waste places throughout the state. Cultivated for forage but becomes a troublesome weed especially for corn farmers since it harbors corn viruses.

Spartina Schreb. Cordgrass.

Erect, often stout tall perennials, with usually extensive creeping, firm, scaly rhizomes, long tough blades and 2 to many appressed or sometimes spreading spikes racemose on the main axis, the slender tips of the rachises naked, often prolonged; spikelets 1-flowered, much flattened laterally, sessile and usually closely imbricate on one side of a continuous rachis, disarticulating below the glumes, the rachilla not exceeding beyond the floret; glumes keeled, 1-nerved, or the second with a second nerve on one side, acute or short-awned, the first shorter than, the second often exceeding, the lemma; lemma firm, keeled, the lateral nerves obscure, narrowed to a rather obtuse point; palea 2-nerved, keeled and flattened, the keel between or at one side of the nerves.

1. Blades usually more than 5 mm wide, flat when fresh, at least at base, tip involute; plants mostly robust and more than 1 m tall 2
- 1'. Blades less than 5 mm wide; involute; plants mostly slender and less than 1 m tall *S. patens*
2. First glume nearly as long as the floret, slender-acuminate, the second with an awn as much as 7 mm long; spikes somewhat distant, mostly more or less spreading *S. pectinata*
- 2'. First glume shorter than the floret, acute, the second acute or mucronate but not slender-awned; spikes approximate, usually appressed 3
3. Blades very scabrous on margins; glumes strongly hispid-scabrous on keels *S. cynosuroides*
- 3'. Blades glabrous throughout or minutely scabrous on the margins; glumes glabrous or usually softly hispidulous or ciliate on the keels *S. alterniflora*

Spartina patens (Ait.) Muhl. Saltmeadow cordgrass.

Culms slender, mostly less than 1 m tall with long slender rhizomes; blades sometimes flat but mostly involute, less than 3 mm wide; spikes 2 to several, appressed to somewhat spreading, 2-5 cm long, rather remote on axis; spikelets 8-12 mm long; first glume about half as long as the floret, the second longer than the lemma; lemma 5-7 mm long, emarginate at apex; palea a little longer than lemma. Salt marshes and sandy meadows along the coast.

Spartina pectinata Link. Prairie cordgrass. Freshwater cordgrass.

Culms 1-2 m tall, firm or wiry; blades elongate, flat when fresh, soon involute in drying, as much as 1.5 cm wide, very scabrous on the margins; spikes mostly 10 to

20, sometimes fewer or as many as 30, mostly 4-8 cm long, ascending, sometimes appressed, rarely spreading, on rather slender peduncles; glumes hispid-scabrous on keel, the first acuminate or short-awned, nearly as long as the floret, the second exceeding the floret, tapering into an awn as much as 7 mm long; lemma glabrous except the scabrous keel, 7-9 mm long, apex with 2 rounded teeth; palea usually a little longer than lemma. Fresh-water marshes extending into brackish marshes along the coast. Sparse throughout state.

Spartina cynosuroides (L.) Roth. Big cordgrass. Salt reedgrass.

Culms 1-3 m tall, stout, the base sometimes as much as 2 cm thick; blades flat, 1-2.5 cm wide, very scabrous on the margins; spikes numerous, ascending, approximate, often dark-colored, usually more or less peduncled, mostly 3-8 cm long; spikelets about 12 mm long; glumes acute, hispid-scabrous on keel, the first much shorter than floret, the second longer than floret, sometimes rather long-acuminate; lemma not toothed at apex; palea a little longer than lemma. Salt or brackish marshes along coast and margins of tidal streams.

Spartina alterniflora Loisel. Salt-marsh cordgrass. Smooth cordgrass. Salt water cordgrass.

Culms soft and spongy or succulent at base, often 1 cm or more thick, smooth throughout or the margins of the blades minutely scabrous, 0.5-2.5 m tall; blades flat, tapering to a long involute tip, 0.5-1.5 cm wide; spikes appressed, 5-15 cm long; spikelets somewhat remote, barely overlapping or sometimes more imbricate, mostly 10-11 mm long; glumes glabrous or hispid on the keel, the first acute, narrow, shorter than the lemma, the second obtusish, a little longer than the lemma; floret sparingly pilose or glabrous. Salt marshes along the coast, often growing in water.

Sphenopholis Scribn. Wedgegrass.

Slender perennials (rarely annual) with usually flat blades and narrow shining panicles; spikelets 2- or 3-flowered, the pedicel disarticulating below glumes, the rachilla produced beyond the upper floret as a slender bristle; glumes unlike in shape, the first narrow, usually acute, 1-nerved, the second broadly ovate, 3- to 5-nerved, the nerves sometimes obscure, mostly somewhat coriaceous, the margin scarious; lemmas firm, scarcely nerved, awnless or rarely with an awn from just below the apex, the first a little shorter or a little longer than the second glume; palea hyaline, exposed.

1. Panicle dense, usually spikelike, erect or nearly so *S. obtusata*
- 1'. Panicle not dense, lax, nodding, not spikelike 2
2. Spikelets awned *S. pallens*
- 2'. Spikelets awnless (rarely awned in *S. filiformis*) 3
3. Lemmas glabrous; second glume acute or subacute;
 - panicle many-flowered *S. intermedia*
- 3'. Lemmas scabrous; second glume broadly rounded
 - at summit; panicle relatively few flowered 4
4. Blades rarely more than 10 cm long, flat, 2-5 mm wide . . . *S. nitida*
- 4'. Blades elongate, flat to subinvolute, mostly less
 - than 2 mm wide *S. filiformis*

Sphenopholis obtusata (Michx.) Scribn. Prairie wedgegrass. Prairie wedge-scale.

Culms erect, tufted, 30-100 cm tall; sheaths glabrous to finely retrorsely pubescent; blades flat, glabrous, scabrous, or pubescent, mostly 2-5 mm wide; panicle erect or nearly so, dense, spike-like to interrupted or lobed, rarely slightly looser, 5-20 cm long; spikelets 2.5-3.5 mm long, the two florets closer together than in the other species; second glume very broad, subcuclate, somewhat inflated at maturity, 5-nerved, scabrous; lemmas minutely papillose, rarely mucronate or with a short straight awn, the first about 2.5 mm long. Open woods, old fields, moist ground throughout the state.

Sphenopholis pallens (Bieler) Scribn. No common name known.

Culms erect, about 60 cm tall; lower sheaths minutely pubescent, the upper glabrous; blades flat, glabrous, 1-2 mm wide; panicle narrow, nodding, loose or somewhat compact, 15-25 cm long, the branches ascending, the lower distant; spikelets 2- or 3-flowered, 3-3.5 mm long; second floret scaberulous, usually awned just below the apex, the awn scabrous, geniculate, 1-2 mm long. Rich wooded slopes in Coastal Plain.

Sphenopholis intermedia (Rydb.) Rydb. Slender wedgegrass.

Culms erect in small tufts, 30-120 cm tall; sheaths glabrous or pubescent, blades flat, often elongate, lax, mostly 2-6 mm wide, sometimes wider, mostly scaberulous, occasionally sparsely pilose; panicle nodding, dense to open, mostly 10-20 cm long, the branchlets spikelet-bearing from base; spikelets 3-4 mm long; second glume relatively thin, acute or subacute, about 2.5 mm long; lemmas subacute, rarely mucronate, smooth or rarely minutely roughened, mostly 2.5-3 mm long. Damp or rocky woods, slopes and moist places. Coastal Plain, Fall Belt and Piedmont.

Sphenopholis nitida (Bieler) Scribn. No common name known.

Culms tufted, leafy at base, slender, shining, 30-70 cm tall; sheaths and blades mostly softly pubescent, occasionally glabrous, the blades 2-5 mm wide, 3-10 cm long, the basal sometimes longer; panicle rather few-flowered, mostly 8-12 cm long, the filiform branches distant, ascending, spreading in anthesis; spikelets 3-3.5 mm long; glumes about equal in length, usually nearly as long as the first floret, the first glume broader than in the other species, the second broadly rounded at summit, at least the second lemma scabrous-papillose. Dry or rocky woods throughout the state.

Sphenopholis filiformis (Chapm.) Scribn. No common name known.

Culms erect, very slender, 30-60 cm tall; blades lax, flat to subinvolute, mostly less than 2 mm wide; panicle slender, often nodding, 5-15 cm long, the short branches rather distant, erect or ascending; spikelets 3-4 mm long, the 2 florets rather distant; second glume broadly rounded at summit, about 2 mm long; lemmas obtuse to subacute, rarely with a short spreading awn, the first smooth, the second minutely roughened. Dry soil, Coastal Plain.

Sporobolus R. Br. Dropseed.

Annuals or perennials with small spikelets in open or contracted panicles; spikelets 1-flowered, the rachilla disarticulating above the glumes; glumes 1-nerved, usually unequal, the second often as long as the spikelet; lemma membranaceous, 1-nerved, awnless; palea usually prominent and as long as the lemma or longer; caryopsis free from the lemma and palea, falling readily from the spikelet at maturity, the pericarp free from the seed, usually thin and closely enveloping it, but readily slipping away when moist.

1. Plants annual 2
- 1'. Plants perennial 3
2. Lemma pubescent *S. vaginiflorus*
- 2'. Lemma glabrous *S. neglectus*
3. Plants with creeping rhizomes, panicle narrow or
spikelike *S. virginicus*
- 3'. Plants without creeping rhizomes 4
4. Glumes nearly equal, much shorter than lemma 5
- 4'. Glumes unequal or, if equal, as long as the spikelet 6
5. Panicle branches short and appressed, panicle spikelike . . . *S. poiretii*
- 5'. Panicle branches slender, ascending, the panicle scarcely
spikelike *S. indicus*
6. Spikelets mostly 3-7 mm long; plants usually
less than 1 m tall 7
- 6'. Spikelets 1-2.5 mm long *S. cryptandrus*
7. Second glume shorter than lemma; panicle contracted,
more or less included in sheath 8
- 7'. Second glume about as long as lemma; panicle open,
not included *S. junceus*
8. Lemma glabrous, palea not exceeding it *S. asper*
- 8'. Lemma pubescent, the acuminate palea exceeding it *S. clandestinus*

Sporobolus vaginiflorus (Torr.) Wood. Poverty dropseed. Dropseed.

Annual, spreading from base; culms erect to spreading, mostly 20-40 cm tall, sometimes as much as 75 cm; blades slender, subinvolute, the lower elongate; panicles terminal and axillary, slender mostly not more than 3 cm long, the terminal exerted or partly included, the axillary included in the sheath or slightly exerted, late in the season the sheaths swollen and containing cleistogamous spikelets; glumes acute, about equal, 3-5 mm long; lemma as long as glumes or exceeding them, acute or acuminate, rather sparsely pubescent, sometimes mottled with dark spots; palea acuminate, sometimes longer than lemma. Sandy soil or open waste ground, scattered throughout the state.

Sporobolus neglectus Nash. Annual dropseed.

Differing from *S. vaginiflorus* chiefly in the smaller, paler, plumper spikelets, 2-3 mm long, and in the glabrous lemma; lower blades often sparsely pilose; panicles usually entirely hidden in the more swollen sheaths. Dry open ground and sandy fields in Alleghany Highlands and Valleys.

Sporobolus virginicus (L.) Kunth. Virginia dropseed.

Perennial with numerous branching widely creeping slender rhizomes (yellowish in drying); culms erect, 10-40 cm tall; sheaths overlapping, more or less pilose at the throat; blades flat or becoming involute especially toward the fine point, conspicuously distichous, mostly less than 5 cm long or on the innovations longer; panicle pale, contracted or spikelike, 2-8 cm long, 5-10 mm thick; spikelets 2-2.5 mm long; glumes and lemma about equal. Sandy or muddy seashores and saline marshes, forming extensive colonies with relatively few flowering culms, Coastal Plain.

Sporobolus poiretii (Roem. & Schult.) Hitchc. Smutgrass.

Perennial; culms erect, solitary or in small tufts, 30-100 cm tall; blades flat or involute, rather firm, 2-5 mm wide at base, elongate, tapering to a fine point; panicle usually spikelike but more or less interrupted, 10-40 cm long, the branches appressed or ascending; spikelets about 2 mm long; glumes obtuse, somewhat unequal, about half as long as spikelet or less; lemma acutish. Open ground, waste places and roadsides scattered throughout the state. Panicle sometimes covered with a black fungus, which suggests the common name.

Sporobolus cryptandrus (Torr.) A. Gray. Sand dropseed.

Perennial, usually in rather small tufts; culms erect or spreading, sometimes prostrate, 30-100 cm tall; sheaths with a conspicuous tuft of long white hairs at summit; blades flat, 2-5 mm wide, more or less involute in drying, tapering to a fine point; panicles terminal and axillary, usually included at the base, sometimes entirely included, the well-developed terminal panicles open, as much as 25 cm long, the branches spreading or sometimes reflexed, rather distant, naked at base, as much as 8 cm long or even more, the spikelets crowded along the upper part of the main branches; spikelets from pale to leaden, 2-2.5 mm long; first glume one-third to half as long, the second about half as long as the acute lemma and palea. Sandy open ground, Piedmont and Coastal Plain.

Sporobolus indicus (L.) R. Br. Smutgrass. Rattail smutgrass.

Resembling *S. poiretii* but the blades more slender, especially at base, and the panicle blades longer, more slender, less densely flowered, loosely ascending to somewhat spreading; the panicle not spikelike. Coastal Plain and across southern part of state. The second edition of Hitchcock's Manual and the eight edition of Gray's Manual places only *S. poiretii* in Virginia. Earlier editions place *S. indicus* in Virginia also. Harvill *et al.* consider *S. poiretii* a synonym of *S. indicus*. See also Riggins, R. 1977. A biosystematic study of the *Sporobolus asper* complex (Gramineae). Iowa St. J. Res. 51:287-321.

Sporobolus junceus (Michx.) Kunth. No common name known.

Perennial, in dense bunches; culms erect, slender, about 3-noded, 30-60 cm tall; blades folded or involute, slender, glabrous; panicle mostly bronze brown, oblong or narrowly pyramidal, open, 7-15 cm long, 2-5 cm wide, the flexuous branches (2-3 cm long) in rather regular whorls 1-3 cm apart, widely spreading to ascending, naked at base, the short-pedicelled spikelets appressed along the upper part; spikelet about 3 mm long; first glume about half as long, the second glume as long as the acute lemma or a little longer. Pine barrens of Coastal Plain.

Sporobolus asper (Michx.) Kunth. No common name known.

Perennial; culms erect, often rather stout, solitary or in small tufts, 60-120 cm tall; blades elongate, flat, becoming involute, 1-4 mm wide at base, tapering to a fine point; panicle terminal and axillary, pale or whitish, sometimes purplish, contracted, more or less spikelike, usually enclosed at base or sometimes entirely in the inflated upper sheath, 5-15 cm long; spikelets 4-6 mm long; glumes rather broad, keeled, subacute, the first about half as long as the spikelet, the second two-thirds to three-fourths as long; lemma and palea subequal, glabrous, the tip boat-shaped. Prairies and sandy meadows, Coastal Plain, Alleghanies and Valleys.

Sporobolus clandestinus (Bieler) Hitchc. No common name known.

Perennial; culms relatively stout to slender, erect to spreading, 50-100 cm tall; lower sheaths sometimes pilose; blades flat, becoming involute, with a long fine

point; panicle narrow, contracted, 5-10 cm long, usually partly enclosed; spikelets 5-7 mm long, the glumes keeled, acute or subacute, the first more than half as long as the spikelet, the second longer than the first; lemma sparsely appressed-pubescent, acuminate, the palea longer, sometimes as much as 10 mm long. Sandy fields, pine barrens and hills, Coastal Plain and scattered in rest of state.

Stipa L. Needlegrass.

Tufted perennials, with usually convolute blades and mostly narrow panicles; spikelets 1-flowered, disarticulating above the glumes, the articulation oblique, leaving a bearded, sharp-pointed callus attached to the base of the floret; glumes membranaceous, often papery, acute, acuminate, or even aristate, usually long and narrow; lemma narrow, terete, firm or indurate, strongly convolute, rarely the margins only meeting, terminating in a prominent awn, the junction of body and awn evident, the awn twisted below, geniculate, usually persistent; palea enclosed in the convolute lemma.

Stipa avenacea L. Blackseed needlegrass. Black oatgrass.

Culms 60-100 cm tall; ligule about 3 mm long, blades 20-30 cm long, 1 mm wide, flat or involute; panicle 10-15 cm long, open, the slender branches 2-4 cm long, bearing 1 or 2 spikelets; glumes 1.5 cm long; lemma dark brown, 9-10 mm long, the callus 2 mm long, the body glabrous, papillose-roughened toward the summit, awn scabrous, 4.5-6 cm long, twice-geniculate. Dry or rocky open woods throughout the state.

Tridens Roem. & Schult.

Erect, tufted perennials, rarely rhizomatous or stoloniferous, the blades usually flat, the inflorescence an open to contracted or capitate panicle; spikelets several-flowered, the rachilla disarticulating above the glumes and between the florets; glumes membranaceous, often thin, nearly equal in length, the first sometimes narrower, 1-nerved, the second rarely 3- to 5-nerved, acute to acuminate; lemmas broad, rounded on the back, the apex from minutely emarginate or toothed to deeply and obtusely 2-lobed, 3-nerved, the lateral nerves sometimes conspicuously so throughout; palea broad, the 2 nerves near the margin sometimes villose; grain concavo-convex. (*Triodia* in Blomquist, 1948).

1. Panicle open or loose, not dense or spikelike 2
- 1'. Panicle narrow, contracted or spikelike, the branches
appressed *T. strictus*
2. Panicle erect, the branches stiffly spreading; pulvini
extending entirely around the base of the branches *T. chapmani*
- 2'. Panicle drooping; pulvini confined to the upper
surface at the base of the branches *T. flavus*

Tridens strictus (Nutt.) Nash. No common name known.

Culms rather stout, erect, 1-1.5 m tall; blades elongate, flat or loosely involute, 3-8 mm wide; panicle dense, spikelike, more or less interrupted below, narrowed above, 10-30 cm long; spikelets short-pedicelled, 4- to 6-flowered, about 5 mm long, the florets closely imbricate; glumes as long as the spikelet, or nearly so, the apex spreading, the keel glandular-viscid toward maturity; lemmas about 3 mm long, obtuse, the keel and margins pilose on the lower half to two-thirds, the midnerve excurrent as a minute awn; palea about as long as the lemma, short-ciliate on the

sharp keels, not strongly bowed out. Low moist grounds and low woods, Coastal Plain. Not common.

Tridens chapmani (Small) Chase. No common name known.

Culms 60-100 cm tall, slender or occasionally rather coarse; lower leaves crowded toward the base, the sheaths narrow, spreading from the culm, keeled, glabrous, densely villose on the collar; blades flat or loosely rolled, elongate, alternate, 3-7 mm wide, narrowed toward the base; panicles 15-25 cm long, usually erect, the branches and branchlets stiffly spreading, the bases of the principal ones surrounded by glandular hairy pulvini; spikelets long-pedicelated, divergent, 7-10 mm long, pale or purple-tinged. Dry pine and oak woods of Coastal Plain.

Tridens flavus (L.) Hitchc. Purple top. Fall red top. Grease grass

Culms erect, tufted, 1-1.5 m tall, basal sheaths compressed-keeled, blades elongate, 3-10 mm wide, very smooth; panicle open, 15-35 cm long, usually purple or finally nearly black, rarely yellowish, the branches distant, spreading to drooping, naked below, as much as 15 cm long, with slender divergent branchlets, the axils pubescent, the axis, branches, branchlets and pedicels viscid; spikelets oblong, mostly 6- to 8-flowered, 5-8 mm long; glumes subacute, mucronate; lemmas 4 mm long, obtuse, pubescent on the callus and lower half of the keel and margins, the 3 nerves excurrent; palea a little shorter than the lemma, somewhat bowed out below. Old fields and open woods throughout the state.

Triplasis Beauv.

Slender tufted annuals or perennials, with short blades, short open, few-flowered, purple, terminal panicles and cleistogamous narrow panicles in the axils of the leaves; spikelets few-flowered, V-shaped, the florets remote, the rachilla slender, disarticulating above the glumes and between the florets; glumes nearly equal, smooth, 1-nerved, acute; lemmas narrow, 3-nerved, 2-lobed, the nerves parallel, silky-villose, the lateral pair near the margin, the mid-nerve excurrent as an awn, as long as the lobes or longer, palea shorter than the lemma, the keels densely long-villose on the upper half.

Triplasis purpurea (Walt.) Chapm. Purple sandgrass.

Annual, often purple; culms ascending to widely spreading, pubescent at the several to many nodes, 30-100 cm tall, rarely taller; blades flat or loosely involute, 1-3 mm wide, mostly 4-8 cm long; panicle 3-5 cm long, with few spreading few-flowered branches, the axillary more or less enclosed in the sheaths; spikelets short-pedicelated, 2- to 4-flowered, 6-8 mm long; lemmas 3-4 mm long, the lobes broad, rounded or truncate, the nerves and callus densely short-villose, the awn about as long as the lobes or somewhat exceeding them; palea conspicuously silky-villose on the upper half of the keels; grain about 2 mm long. Dry sandy soil of Coastal Plain.

Tripsacum L. Gamagrass.

Robust perennials, with usually broad flat blades and monoecious terminal and axillary inflorescences of 1 to 3 racemes, the pistillate part below, breaking up into bony, seedlike joints, the staminate above on the same rachis, deciduous as a whole; spikelets unisexual; staminate spikelets 2-flowered, in pairs on one side of a continuous rachis, one sessile, the other sessile or pedicillate, similar to those of *Zea*, the glumes firmer; pistillate spikelets solitary (a minute rudiment of a sterile spikelet, sometimes found) on opposite sides at each joint of the thick hard

articulate lower part of the same rachis, sunken in hollows in the joints, consisting of one perfect floret and a sterile lemma; first glume coriaceous, nearly infolding the spikelet, fitting into and closing the hollow of the rachis; second glume similar to the first but smaller, infolding the remainder of the spikelet; sterile lemma, fertile lemma and palea very thin and hyaline, these progressively smaller.

Tripsacum dactyloides (L.) L. Eastern gamagrass.

Plants in large clumps, with thick knotty rhizomes, 2-3 m tall or sometimes taller, glabrous throughout; blades usually 1-2 cm wide, flat, scabrous on the margin; inflorescence 15-25 cm long, the pistillate part one-fourth the entire length or less, the terminal racemes usually 2 or 3, sometimes only 1, those of the branches usually solitary; pistillate spikelets 7-10 mm long, the joints rhombic; staminate spikelets 7-11 mm long, both of a pair nearly sessile, the glumes rather chartaceous. Swales, banks of streams and moist places throughout the eastern and central parts of the state.

Trisetum Pers. *Trisetum*.

Tufted perennials with flat blades and open or usually contracted or spike-like shining panicles; spikelets usually 2-flowered, sometimes 3- to 5-flowered, the rachilla prolonged behind the upper floret, usually villose; glumes somewhat unequal, acute, the second usually longer than the first floret; lemmas usually short-bearded at base, 2-toothed at apex, the teeth often awned, bearing from the back below the cleft apex a straight and included or usually bent and exerted awn.

Trisetum pennsylvanicum (L.) Beauv. ex Roem. and Schult. (= *Sphenopholis pennsylvanica* (L.) Hitchc. in Harvill *et al.*, 1987). No common name known.

Culms slender, weak, usually subgeniculate at base, 50-100 cm tall; sheaths glabrous or rarely scabrous; blades flat, scabrous, 2-5 mm wide; panicle narrow, loose, nodding, 10-20 cm long; pedicels disarticulating about the middle or toward the base; spikelets 5-7 mm long, 2-flowered, the long rachilla internodes slightly hairy; glumes mostly 4-5 mm long, acute, the second wider; lemmas acuminate, the first usually awnless, the second awned below the 2 setaceous teeth, the awn horizontally spreading, 4-5 mm long. Swamps and wet places in Coastal Plain.

Uniola L.

Rather tall, erect perennials, with flat or sometimes convolute blades and narrow or open panicles of compressed, sometimes very broad and flat spikelets; spikelets 3- to many-flowered, the lower 1 to 6 lemmas empty, the rachilla disarticulating above the glumes and between the florets; glumes compressed-keeled, rigid, usually narrow, 3- to 7-nerved, acute or acuminate, rarely mucronate; lemmas compressed, sometimes conspicuously flattened, chartaceous, many-nerved, the nerves sometimes obscure, acute or acuminate, the empty ones at the base and the uppermost usually reduced; palea rigid, strongly keeled, bowed out at the base; stamen 1.

1. Rhizomes extensively creeping; blades firm, flat at base, tapering into a long flexuous involute point; empty lemmas about 4; coastal dunes *U. paniculata*
- 1'. Rhizomes wanting or short and knotty; blades thin, flat; empty lemma 1; rich or moist woods 2
2. Spikelets 8- to 12-flowered on slender pedicels; panicle nodding or drooping *U. latifolia*

2. Spikelets 3- to 7-flowered, nearly sessile; panicle erect, nearly simple, branches stiff 3
3. Collar of sheath pubescent, the sheaths commonly loosely long-pubescent, rarely glabrous *U. sessiliflora*
- 3'. Collar and sheaths glabrous or nearly so *U. laxa*

Uniola paniculata L. Sea oats.

Culms stout, about 1 m tall, from extensively creeping rhizomes; blades flat, firm, elongate, becoming involute toward the long, fine flexuous point; panicle pale, narrow, condensed, heavy and nodding, 20-40 cm long, the branches arching and drooping, as much as 12 cm long; spikelets very flat, 10- to 20-flowered, mostly 2-2.5 cm long, 1 cm wide, the first 4 to 6 lemmas empty, the slender pedicels shorter than the spikelets; lemmas about 9-nerved, strongly compressed-keeled, about 1 cm long, acute; palea acute, as long as the lemma, the strong wings of the keels ciliate. Sand dunes of the sea coast on Eastern Shore, Cities of Hampton, Chesapeake and Virginia Beach.

Uniola latifolia Michx. Broadleaf uniola. Broadleaf sea oats. Inland sea oats.

Culms 1-1.4 m tall, with short strong rhizomes, forming colonies; blades flat, narrowly lanceolate, 10-20 cm long, mostly 1-2 cm wide; panicle open, drooping, 10-20 cm long, the branches bearing a few large, very flat spikelets, the pedicels capillary; spikelets 8- to 12-flowered, 2-3.5 cm long, 1-1.5 cm wide, green or finally tawny, the first lemma empty; lemmas lanceolate, strongly compressed-keeled, acute, about 1 cm long, striate-nerved, the keel ciliate with soft ascending hairs, the callus pilose; palea shorter than the lemma, wing-keeled; anther minute, the flower cleistogamous; caryopsis flat, oval, black, 5 mm long. Rich woods throughout the state.

Uniola sessiliflora Poir. No common name known.

Culms erect, 0.5-1.5 m tall, in loose tufts with short rhizomes; sheaths pilose, at least toward the summit; blades elongate, firm, mostly sparsely pilose on the upper surface toward the base, 5-10 mm wide, tapering to base; panicle long-exserted, 20-50 cm long, narrow, the branches distant, stiffly ascending or appressed, the lower as much as 7 cm long, the upper short, somewhat capitate; spikelets nearly sessile, aggregate in clusters, flat, usually 3- to 5-flowered, broadly V-shaped at maturity, the first lemma empty; glumes about 2 mm long; lemmas spreading, about 5 mm long, acuminate, beaked, especially before maturity, striate-nerved; palea shorter than the lemma, acute, broad, the keels narrowly winged; grain black, 3 mm long, at maturity spreading the lemma and palea; anther 1.3 mm long. Rich woods of Coastal Plain.

Uniola laxa (L.) B.S.P. No common name known.

Culms slender, 60-100 cm tall, erect to nodding from a loosely tufted sometimes knotty base; blades elongate, flat to sometimes loosely involute, 3-6 mm wide; panicle narrow, slender, 15-30 cm long, the branches short, appressed, approximate, the lower sometimes 3 cm long and distant; spikelets nearly sessile, approximate, flat, usually 3- to 4-flowered, the first lemma empty; lemmas spreading, 4-5 mm long, gradually acuminate, striate-nerved; palea broad, the keels narrowly winged; grain black, 2.5 mm long, at maturity spreading the lemma and palea; anther 1.2 mm long. Moist woods of Coastal Plain and Piedmont, occasionally Ridges and Valley.

The last three species, *U. latifolia*, *U. sessiliflora* and *U. laxa*, are placed by Gould and Shaw (1983) in the genus *Chasmanthium*.

Zizania L. Wildrice.

Tall aquatic annuals or perennials, with flat blades and large terminal panicles, the lower branches ascending or spreading, bearing the pendulous staminate spikelets, the upper branches ascending or spreading, at maturity erect, bearing appressed pistillate spikelets, the staminate spikelets early deciduous, the pistillate spikelets tardily deciduous; spikelets unisexual, 1-flowered, disarticulating from the pedicel; glumes obsolete, represented by a small collarlike ridge; pistillate spikelet terete, angled at maturity; lemma chartaceous, 3-nerved, tapering into a long slender awn; palea 2-nerved, closely clasped by the lemma; grain cylindrical, 1-2 cm long; staminate spikelet soft; lemma 5-nerved, membranaceous, linear, acuminate or awn-pointed; palea about as long as the lemma, 3-nerved; stamens 6.

Zizania aquatica L. Annual wildrice. Indian rice. Wildrice. Southern wildrice. Broadleaved wildrice.

Annual; culms robust, usually 2-3 m tall; blades elongate, 1-4 cm wide, scaberulous; ligule 10-15 mm long; panicles mostly 30-50 cm long, the branches mostly 15-20 cm long; lemma and palea of pistillate spikelet about 2 cm long, thin, hispid throughout. Marshes and borders of streams and ponds, usually in shallow water in Coastal Plain to Fall Belt.

Zizaniopsis Doell & Aschers.

Robust perennial marsh grasses, with stout creeping rhizomes, broad flat blades and large open panicles; spikelets unisexual, 1-flowered, disarticulating from the pedicel, mixed on the same branches of the panicle, the staminate below; glumes wanting; lemma 7-nerved, short-awned in the pistillate spikelets; palea 3-nerved; staminate spikelets with 6 stamens; styles rather long, united; fruit obovate, free from the lemma and palea, coriaceous, smooth and shining, beaked with the persistent style; seed free from the pericarp.

Zizaniopsis miliacea (Michx.) Doell and Aschers. Southern wildrice. Marsh millet.

Culms 1.3 m tall or even taller; blades glabrous except the very scabrous margins, 1-2 cm wide, the midrib stout; panicle rather narrow, nodding, 30-50 cm long, the numerous branches fascicled, as much as 15-20 cm long, naked at base; spikelets 6-8 mm long, short awned, the staminate slender, the pistillate turgid at maturity. Marshes, creeks and riverbanks, Coastal Plain and Piedmont.

GLOSSARY

Acuminate. Gradually tapering to a sharp point.

Acute. Sharp-pointed.

Anthesis. The period when the lemma and palea are expanded and the anthers and stigma are mature.

Antorse. Directed upwards or forwards.

Apiculate. Having a minute, pointed tip.

Appressed. Lying close against an organ.

Arcuate. Curved like a bow.

Aristate. Awned; provided with a bristle.

Auricle. An ear-like lobe.

Awn. A slender bristle arising from the end or back of a glume or lemma.

Axil. The angle between an organ and the axis to which it is attached.

Axis. The main stem of an inflorescence.

Bifid. Two-cleft or two-lobed.

Blade. The part of a leaf above the sheath.

Bract. Reduced, modified leaf.

Bristle. A stiff, slender appendage.

Bulb. An underground stem with fleshy scales like an onion.

Callus. The hardened base of a mature lemma in some grasses.

Capillary. Very slender, hairlike.

Capitate. In a globular cluster or head.

Caryopsis. The grain or fruit of grasses.

Chartaceous. Having the texture of writing paper.

Ciliate. Fringed with hairs on the margin, like an eyelash.

Cleistogamous. Applied to flowers or florets when fertilized without opening.

Collar. The area on the under side of a leaf at the junction of sheath and blade.

Convolute. Rolled longitudinally.

Coriaceous. Leathery in texture.

Corm. The hard swollen base of a stem.

Cucullate. Having the shape of a hood.

Culm. The jointed stem of a grass.

Deciduous. Falling away; the opposite of persistent.

Decumbent. Curved upward from a horizontal or inclined base.

Depauperate. Impoverished or dwarfed.

Diffuse. Open and much-branched.

Diocious. Unisexual, the two kinds of flowers on separate plants.

Digitate. Several racemes or spikes arising from the summit of a peduncle.

Distichous. Conspicuously 2-ranked.

Ellipsoid. Shaped nearly like a football.

Excurrent. Running beyond.

Exserted. Protruding.

Fascicle. A little bunch or cluster.

Fertile. Capable of producing fruit.

Fibrillose. Furnished with fibers.

Filiform. Threadlike.

Fimbriate. Fringed.

- Flexuous.** Bent alternately in opposite directions.
- Floret.** The palea and lemma with the included flower.
- Fusiform.** Broadest in the middle, tapering to each end.
- Geniculate.** Bent abruptly.
- Glabrescent.** Tending to become smooth.
- Glabrous.** Without hairs; smooth.
- Gland.** A structure that secretes a fluid.
- Glaucous.** Covered with a bluish waxy coating.
- Glumes.** The two bracts at the base of a spikelet.
- Hirsute.** Bearing straight, stiff hairs.
- Hispid.** Bearing stiff hairs.
- Imbricate.** Overlapping.
- Indurate.** Hard.
- Inflorescence.** The flowering part of a plant.
- Innovation.** The basal shoot of a perennial grass.
- Internode.** The part of a stem between the nodes.
- Involute.** Rolled inward from the edges, the upper surface within.
- Joint.** The node of a culm.
- Keel.** The sharp fold at the back of a sheath, blade or lemma.
- Lanate.** Woolly.
- Lanceolate.** Narrow, tapering to both ends, but the broadest part below the middle.
- Lax.** Loose.
- Lemma.** The lower of the two bracts inclosing the grass flower.
- Ligule.** A thin appendage on the upper side of a leaf at the junction of the sheath and the blade.
- Linear.** Long and narrow.
- Monoecious.** Unisexual with both kinds of flowers on the same plant.
- Mucronate.** Provided with a minute awn or excurrent midnerve of an organ.
- Nerve.** A vein of blades, glumes and lemmas.
- Node.** The joint of a culm.
- Ovate.** Egg-shaped in outline, the broadest part below the middle.
- Palea.** The inner bract of a floret.
- Panicle.** An inflorescence with a main axis and branches.
- Papillose.** Bearing minute, nipple-like projections.
- Pectinate.** Comb-like; spikelets closed together, parallel and branching from the rachis like the teeth of a comb.
- Pedicel.** The stalk of a spikelet.
- Perfect.** Flowers that have both stamens and pistils.
- Pericarp.** The ripened walls of the ovary when it becomes a fruit.
- Persistent.** Remaining attached.
- Pilose.** Bearing soft, straight hairs.
- Pubescent.** Covered with hairs.
- Pulvinus.** The swelling at the base of the branches of some panicles which cause them to spread.
- Raceme.** An unbranched flower cluster bearing pedicelled flowers on an elongated rachis.

- Rachilla.** The axis of a spikelet.
- Rachis.** The axis of a spike or raceme.
- Retrorse.** Pointing backward.
- Rhizome.** A creeping, underground stem.
- Rosette.** A cluster of radiating basal leaves.
- Rudiment.** An imperfectly developed organ or part.
- Rugose.** Wrinkled.
- Saccate.** Bag or sac-like.
- Scabrous.** Rough.
- Secund.** One-sided or arranged along one side.
- Sessile.** Without a pedicel.
- Serrate.** Saw-toothed.
- Setaceous.** Bristle-like.
- Sheath.** The lower part of a leaf, enclosing the stem.
- Spathe.** A sheathing bract of the inflorescence.
- Spikelet.** The unit of the inflorescence, composed of two glumes and one or more florets.
- Sterile.** Without pistils.
- Stipe.** A tiny stalk to an organ.
- Stolon.** A horizontal stem creeping on the surface of the ground.
- Terete.** Cylindrical.
- Truncate.** Ending abruptly, as if cut off.
- Turgid.** Swollen.
- Unisexual.** Having only stamens or only pistils.
- Villose.** Bearing long, soft hairs.
- Web.** A cluster of slender, soft hairs.
- Whorl.** An arrangement of leaves or flowers in a circle around the stem.

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