Chapter 1

Identification and description

There is more than one suitable cultivar[1] of most nwsg within the Mid-South region. It is important to identify and determine the cultivar best suited for the intended use (whether wildlife habitat, livestock forage or both) and site conditions (such as bottomlands or dry uplands).

Big bluestem

Andropogon gerardii

Big bluestem is a warm-season perennial that spreads by short rhizomes, creating clumps. Stems may reach 8–9 feet, depending on variety and site conditions. Growth begins in April; however, the majority of growth occurs after June 1. Growing points are close to the ground until late summer (after seedhead has formed) when they are 2–4 inches above ground. Leaves are long, flat and rough along the margins. The ligule is small and membranous; the sheath is somewhat flattened, open and usually hairy. One of the best features used to identify this grass before flowering is the presence of fine silky hairs on the sheath and widely dispersed on the upper leaf surface. The stem is usually purplish at the base and covered with fine hair. The seedhead is two or three distinct racemes on the top of the stem, resembling a turkey's foot. Awns make the seed appear

Fig. 1.1 The grand grass of the tallgrass prairie, big bluestem, was once quite prominent throughout the Mid-South.

[1] For clarification, a cultivar (or variety) is an ecotype that has gone through years of testing before release by a plant materials center. Cultivars are tested and selected for specific characteristics such as disease resistance, forage yield, or plant vigor. An ecotype is a selection of pre-varietal materials and differs from other ecotypes in morphological and physiological traits, such as height, stem diameter or growth rate. A genotype refers to the hereditary make-up and characteristics of a pure line (no genetic manipulation) or variety.

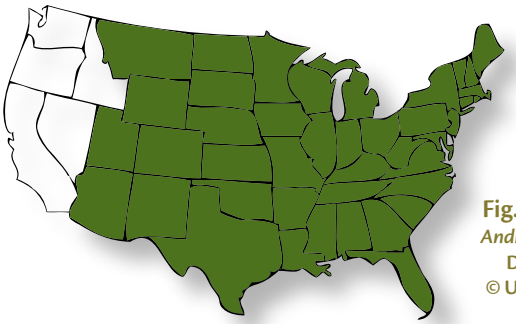

Fig. 1.2
Andropogon gerardii Vitman
Distribution by State
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Fig. 1.4 Big bluestem seed

Fig. 1.3 Big bluestem can be identified fairly easily before flowering by the presence of small individual hairs at the base of the leaf.

"hairy." Big bluestem grows on a wide variety of soils, even on sites with a pH as low as 4.0. Big bluestem is extremely drought-tolerant, with root systems that may grow 12 feet deep. Cultivars of big bluestem adapted to the Mid-South region include:

Rountree — originally collected in Monona County (west central), Iowa and released for use in northern Missouri, Iowa and Illinois, this cultivar was developed for areas of the upper Midwest and eastern U.S. *Rountree* is well-adapted to the higher humidity levels of what once was the eastern tall grass prairie and prairie remnants of the north-eastern U.S. *Rountree* has a relatively short growing season, reaching maturity earlier than most varieties.

Niagara — originally collected in Erie County, New York, this cultivar was released for its superiority over Midwestern cultivars in the northeastern U.S. It is adapted to various soil types, but grows best on moist, well-drained, fertile loam. *Niagara* is tolerant of hot, dry conditions, low-phosphorus soils and low pH. Root development may reach deeper than 10 feet. For these reasons, *Niagara* is suitable for planting sand and gravel pits, strip mines and roadsides. *Niagara* has been grown successfully as far south as Tennessee, but is recommended from West Virginia to Maine.

Kaw — originally collected along the Kaw River in eastern Kansas, *Kaw* thrives in hot, dry conditions, shows superior leafiness and vigor, and is considered more disease-resistant than some big bluestems. *Kaw* tends to develop rust in eastern, high-humidity regions. It has a broader genetic base than *Niagara* or *Rountree*, thus *Kaw* matures over a longer period.

Earl — originally collected in Texas, this cultivar is adapted to all soil types in the South.

Oz-70 — originally collected in northern Arkansas and southern Missouri, this cultivar was released for its ability to grow in shallow, poorer soils. It has a very broad genetic base, including materials from all the regions where collected. *Oz-70* is expected to do well in the southern Appalachians and have very good rust resistance in high-humidity regions.

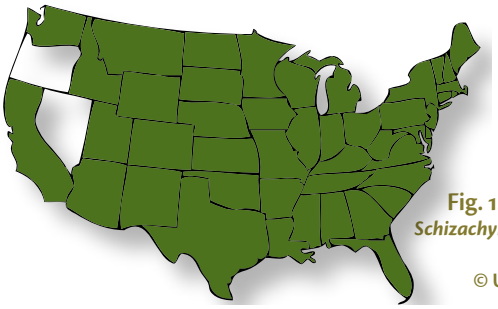

Fig. 1.5
Schizachyrium scoparium (Michx.) **Nash**
Distribution by State
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Little bluestem
Schizachyrium scoparium

Little bluestem is a warm-season perennial bunchgrass that grows 2–4 feet in height. Primary growth occurs from mid spring through summer, reaching maximum height in July. Leaves are flat, often folded along the midrib, 6–10 inches long, less than ¼-inch wide, and bluish-green through early summer until stems begin to form. The ligule is small and membranous, resembling a ring of short hairs on some plants; the sheath is flattened, open and may be purplish at the base. The stem is flattened at base and often red or purplish during early growth. Mature plants are reddish-brown. The seedheads are racemes found singly, in pairs or in groups and are produced in early fall. Awns make the seed appear "hairy." Little bluestem grows on a wide

Charles Dixon

Fig. 1.6 By mid-summer, little bluestem becomes quite stemmy (if not previously hayed) and the red coloration begins to appear.

Fig. 1.8 Little bluestem seedheads are not partly enclosed in a spathe as are broomsedge seedheads.

Fig. 1.7 Little bluestem seed

variety of soils and is a very attractive grass in summer and fall. It has great potential for landscaping and erosion control on poor, droughty soils. The cultivar best adapted and marketed for the Mid-South region is:

Aldous — originally collected from the Flint Hills of Kansas, this cultivar is leafy and late-maturing. *Aldous* produces better stands than other varieties and none are more adaptable or hardier. However, new cultivars are needed for the Mid-South region where high humidity and low soil pH can affect production of *Aldous*.

Fig. 1.9 This is a comparison of broomsedge (left) and little bluestem (right) in mid-October. The light tan color of broomsedge is most noticeable compared to the dark red stems of little bluestem. Color, however, may vary. Most important in distinguishing these species is the seedheads.

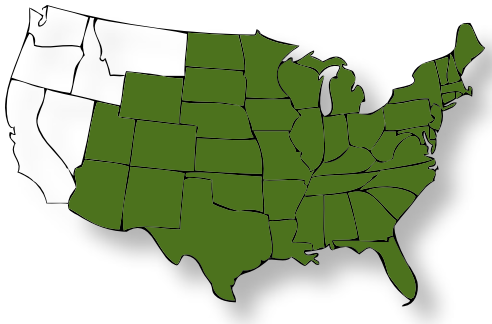

Fig. 1.10
Andropogon virginicus L.
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Broomsedge bluestem
Andropogon virginicus

"Broomsedge" is a warm-season perennial bunchgrass that grows 2–4 feet in height. Growth begins in spring when daytime temperatures reach 60–65 degrees F. Leaves are flat to partly folded (⅛–¼-inch wide) and may have sparse hairs at the leaf base on the upper side. The ligule is fringed and approximately 1/16-inch long; the sheath is flattened, overlapping at the base and usually pale yellowish-green. The stem is flattened at the base and smooth. Mature plants are tannish-brown. The seedheads are racemes partly enclosed in a large straw-colored spathe (reduced leaf or bract) as long as or longer than the raceme. Little bluestem does not have this spathe (**this is a definitive way to distinguish broomsedge from little bluestem after flowering**). Mature broomsedge appears lighter in color than little bluestem, which usually has a reddish hue. Also, the stem and leaves of little bluestem often appear narrower than those of broomsedge. When dormant, broomsedge appears quite orange-tan, while little bluestem is distinctly more reddish-brown. Broomsedge grows on a wide variety of soils and is renowned for growing in old-fields low in fertility.

Fig. 1.11 Broomsedge remains erect through winter better than any other native warm-season grass.

Fig. 1.12 Broomsedge bluestem seed

Fig. 1.15 The golden seedhead of indiangrass is easily distinguishable and very attractive.

Fig. 1.13 Indiangrass seed

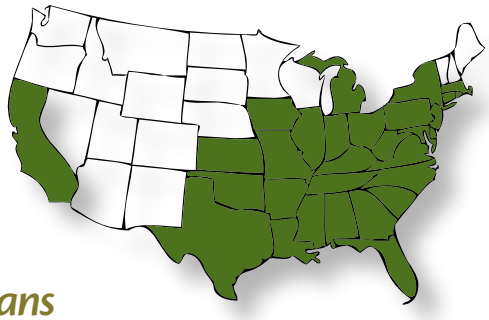

Fig. 1.14
Sorghastrum nutans (L.) Nash
Distribution by State
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Indiangrass
Sorghastrum nutans

Indiangrass is a warm-season perennial that spreads by seed and short rhizomes; however, it normally occurs in bunches, much like big bluestem. Growth begins in April and, depending on site, will reach 3–7 feet in height. Leaves are flat and narrow at the base, growing 10–24 inches long. The ligule is quite prominent (up to ½ inch long) and notched at the tip, making it resemble the rear sight on a rifle—**this is one of the best features used to identify indiangrass before flowering.** The sheath is round and open and is generally shorter than the internodes. The seedhead of indiangrass is a beautiful golden bronze-to-yellow, tight panicle 6–12 inches long, usually formed in August. Awns may be ½ inch long, making indiangrass seed "bearded" and very fluffy. Indiangrass produces a deep root system, making this grass quite drought-tolerant. It is a heavy seed producer and one of the first perennial native grasses to re-colonize old-fields and disturbed soils if a seed source is nearby. Cultivars of indiangrass adapted to the Mid-South region include:

Fig. 1.16 Indiangrass has a very prominent ligule at the base of the leaf, unlike any other nwsg. This is a very good identifying characteristic before flowering.

Osage — originated from collections made in southeastern Kansas. It is a vigorous, leafy cultivar, well-adapted to drier climates. *Osage* is the latest-maturing cultivar of indiangrass and produces excellent forage, even during drought years.

Newberry — recently released cultivar from Newberry County, South Carolina intended for use in conservation buffers, wildlife habitat improvement and critical area stabilization.

Rumsey — originally collected in Jefferson County, Illinois for use in the Midwest, this cultivar is relatively late to mature, but displays rapid growth in mid- to late-summer.

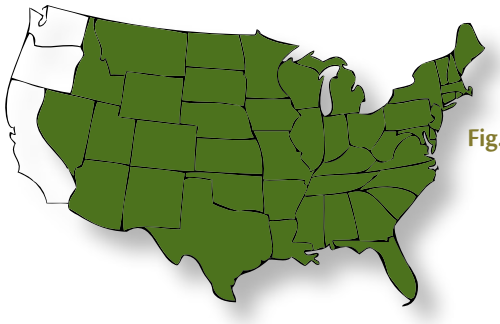

Fig. 1.17
Panicum virgatum L.
Distribution by State
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Switchgrass
Panicum virgatum

Switchgrass is a warm-season perennial that typically grows to 3–7 feet high. Although switchgrass spreads by rhizomes (and seed), loose clumps or patches are usually formed. Switchgrass is an early-maturing warm-season grass (late May–early June); growth usually begins in April. The rhizomes, however, may grow actively from January–April. Growing points are 4–5 inches aboveground during the latter part of the growing season. Leaves are flat, ½ inch wide and sometimes up to 30 inches long. The ligule is often a fringe of short hairs with a dense patch of hair extending onto the upper leaf surface [**this is one of the best features used to identify switchgrass before flowering**]. The sheath is round and open and often purplish or red at the base. The seedhead is an open panicle, usually formed in late May through June. Switchgrass is adapted to a wide variety of soils and site conditions. With an extensive root system, switchgrass is extremely drought-tolerant, but also does well on relatively wet sites with some cultivars tolerant of extended flooding. Switchgrass can be divided into

Fig. 1.18 The ligule of many switchgrass ecotypes is a dense fringe of pubescence. This is an excellent characeristic for identifying switchgrass prior to seedhead formation.

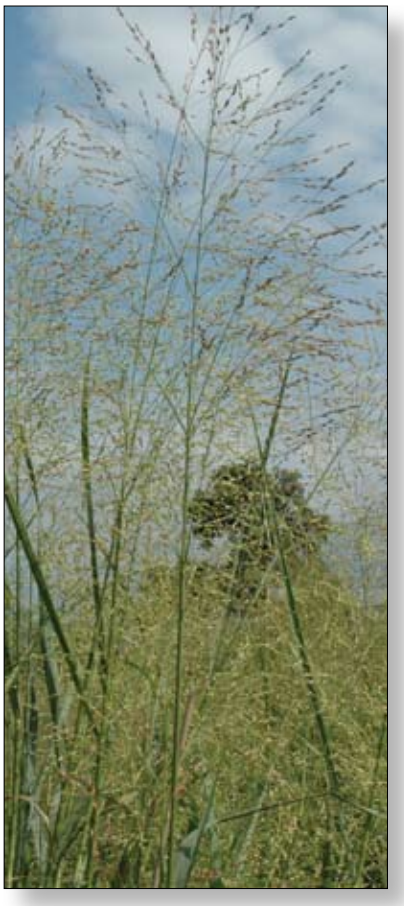

Fig. 1.19 The seedhead of switchgrass is an open panicle, usually appearing in late May.

Fig. 1.20 Switchgrass seed

two broad types: upland and lowland. Lowland types are quite coarse and may lack the hair patch at the ligule as described above. Planted in monocultures, upland types tend to thrive for 10–15 years before declining in productivity. In mixtures, they may tend to dominate (depending on management) before declining into a more harmonious balance with other native grasses and forbs. Cultivars of switchgrass adapted to the Mid-South region include:

Cave-in-Rock — originally collected in southern Illinois, this upland-type cultivar was selected for its palatability and disease resistance. *Cave-in-Rock* is later-maturing than other switchgrass cultivars and grows best on fertile, well-drained soils. It is well-adapted to the high-humidity areas of the eastern U.S. *Cave-in-Rock* seed tends to have high dormancy.

Kanlow — lowland cultivar well-suited to the lowland sections of the South. *Kanlow* not only performs well on poorly drained sites and areas subject to periodic flooding, but also on upland sites. It can tolerate inundation for more than a month during the growing season and is often used along shorelines to reduce bank cutting and erosion. *Durham* — newly released from materials collected in Durham County, North Carolina, this cultivar is a tall, robust grass, which produces attractive foliage and a whitish panicle in the fall. *Durham* was selected primarily for conservation benefits, including wildlife habitat improvement, erosion control and ecological restoration; however, its use as a livestock forage has great potential.

Alamo — developed in Texas, this lowland-type cultivar matures relatively late, which ensures production into early fall. *Alamo* may reach 10 feet in height and its foliage is coarser than some switchgrass cultivars.

Blackwell — produces heavy roots and stems that make it an excellent choice for conservation use and wildlife cover. *Blackwell* is disease-resistant and produces lush foliage longer into the growing season than most varieties of switchgrass. It is also a relatively short variety, only reaching 3–5 feet in height.

Shelter — originally collected in West Virginia, this cultivar is adapted to provide nesting and escape cover for wildlife and possibly for biomass energy production. *Shelter* has short rhizomes; thicker, stiffer stems; and fewer leaves than other varieties of switchgrass. At maturity, *Shelter* reaches 4–6 feet in height, depending on soil conditions, and may remain erect through winter snow, rain and wind. *Shelter* is adapted to a variety of soil conditions, but grows best on well-drained or moderately well-drained sandy loam, silt loam or silty clay loam soils. Nonetheless, *Shelter* can tolerate long periods of soil saturation. *Shelter* is adapted to sites as far south as Tennessee, but does best from Virginia to Maine.

Fig. 1.21
Tripsacum dactyloides (L.) L.
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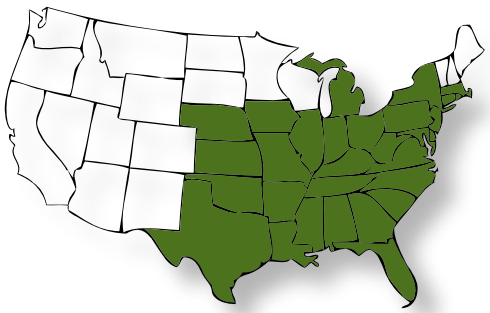

Eastern gamagrass
Tripsacum dactyloides

Eastern gamagrass is a warm-season perennial that spreads by thick, short-jointed rhizomes, but produces conspicuous stools up to 4 feet in diameter. Over time, stool size increases with age and the center will lack stems and leaves. Eastern gamagrass starts growth in early spring, reaches a height of 5–9 feet and usually remains green until first frost. Leaves are flat, smooth, up to 1½ inches wide and 2 feet long and have a pronounced light-colored midrib. The ligule is a ring of short hairs; the sheath is flattened and open. The seedhead is comprised of two or three terminal spikes (sometimes one) 6–10 inches long. This seedhead resembles the central "stem" found on a tassel of corn, of which eastern gamagrass is a close relative. The female part of the seedhead is the lower one-fourth and the male part is on the upper three-fourths. The seed are sunken in the joints of the female portion and when mature, these joints separate with each part containing one seed. Eastern gamagrass grows

Fig. 1.22 Eastern gamagrass seedhead. Male flowers are still present. What will become seed is just below the male flowers.

Fig. 1.23 Eastern gamagrass produces excellent forage for haying and grazing.

Fig. 1.24 Eastern gamagrass seed

best on moist, well-drained fertile soils but does not tolerate standing water for long periods. Cultivars of eastern gamagrass adapted to the Mid-South region include:

Pete — developed from seed collections in Oklahoma and Kansas, *Pete* is a superior seed producer.

Highlander — robust plant noted for disease resistance. *Highlander* is a recently released cultivar collected in Montgomery County, Tennessee. Seed should be available for planting in 2009.

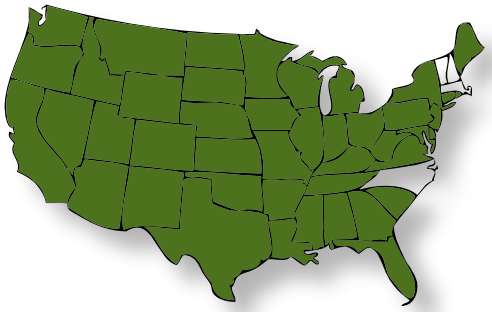

Fig. 1.25
Bouteloua curtipendula (Michx.) Torr.
Distribution by State
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Sideoats grama
Bouteloua curtipendula

Sideoats grama is a warm-season perennial that spreads by short rhizomes. Growth begins in early spring, reaching a height of 1–4 feet. Leaves are flat, up to ⅛-inch wide and 4–8 inches long with small hairs present along the margins. The ligule is small and membranous with short hairs on top; the sheath is round, open and overlapping. Seedstalks appear between June and September. The oat-like seeds hang down uniformly along one side of the slender rachis, thus the name "sideoats." Sideoats grama typically has two growth forms: 1) short (8–14 inches) rhizomatous growth, which produces few seedheads and spreads by rhizomes; and 2) tall (16–48 inches), upright bunches with many seedheads, which reproduces by seed. Sideoats grama grows on a wide variety of soils, including well-drained uplands and shallow ridges. Cultivars of sideoats grama adapted to the Mid-South region include:

El Reno — produces strong leafy plants. *El Reno* is noted for its disease resistance and winter hardiness. Developed at Manhattan, Kansas from materials collected in north-central Oklahoma, it is probably the best-suited cultivar for the Mid-South.

Trailway — requires most of the growing season before seeding. *Trailway* is winter-hardy and relatively long-lived. Developed from materials collected in Nebraska, it does well far south of its origin.

Fig. 1.26 Sideoats grama provides excellent nesting cover for bobwhites and other birds. It persists best in a mixture with other relatively short grasses, such as little bluestem.

Fig. 1.27 Sideoats grama seed

Fig. 1.28 Splitbeard bluestem

Other native warm-season grasses

There are many other less-recognized nwsg that occur in the Mid-South. Their value to wildlife varies, but their value as forage is minimal. Some of the more common ones include: splitbeard bluestem (*Andropogon ternarius*), Elliot's bluestem (*Andropogon gyrans*), bushy bluestem (*Andropogon glomeratus*), purpletop (*Tridens flavus*), giant cane (*Arundinaria gigantea*), beaked panicum (*Panicum anceps*), paspalum (*Paspalum* spp.), silver plumegrass (*Saccharum alopecuroidum*), purple lovegrass (*Eragrostis spectabilis*) and several low panicgrasses (*Dichanthelium spp.*).

Fig. 1.29 Bushy bluestem

Fig. 1.30
Florida paspalum

Fig. 1.31 Deertongue

Fig. 1.32 Beaked panicum

Fig. 1.33 Low panicgrass

USDA, NRCS. 2006. The PLANTS Database (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.