

Wildlife Plantings Food and Cover Plantings Shrub Lespedezas

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SHRUB LESPEDEZAS

Natob Bicolor lespedeza (*Lespedeza bicolor* Turcz)

Uses

Seed of Natob Bicolor lespedeza is excellent fall and winter food for bobwhite quail. Pheasants and songbirds like the seed and rabbits and deer browse the foliage. Tests have shown that it is a high quality food for these animals.

Honeybees frequent the flowers and from them make a high-grade honey. Because Natob Bicolor lespedeza blooms when few other good honey plants are available, it is valuable to beekeepers. Its masses of late summer blooms make an attractive landscaping feature when the plants are used in borders and hedges.

Natob Bicolor lespedeza can be used alone or in combination with other plants. A particularly productive combination for wildlife improvement is a wide border of bicolor and a low-growing shrub. The bicolor should be planted next to the fence or woodland.

Natob Bicolor lespedeza can be used in a number of locations on the farm. The zone of poor crop growth in field borders and along woodlands is a good place to plant lespedeza. It is particularly useful in small areas devoted to wildlife habitat, on marginally productive soils, and in woodland openings. The fibrous root system and good litter-producing qualities make lespedeza an excellent erosion control plant.

Characteristics

Natob Bicolor lespedeza is a large, leguminous shrub. Allowed to grow naturally, it reaches a height of 8

to 10 feet. The stems are 1 inch or more in diameter at the base and well-branched. If cut back near the ground, the shrub produces numerous stems of lesser diameter and height. Eventually, if not cut back, lespedeza's older stems will gradually die back to the ground to be replaced by new wood. The plant contains an abundance of reserve basal buds, which insure good recovery in case the first tender growth of spring is injured by frost. The plant has a heavy, multi-branching root system.

Natob blossoms and matures seed earlier than other strains of Bicolor lespedeza. Usually, the flowers appear first in late June and early July and continue for four to six weeks. This is at least a month earlier than common bicolor. The flowers are pinkish purple and remain open only one day.

Seed matures in late September or early October. Dark purplish-brown or mottled brown in color, the seed occurs singly in oval pods about 1/4 inch long. Some plants hold part of their seed into the winter, but most of it drops in autumn. Usually 80 to 90 percent of the seeds fall by the first of January.

Adaptation

Shrub lespedezas can be used in droughty, well-drained soils or in imperfectly drained and slightly acid to slightly alkaline soils. They perform well in most soil textures; the exception to this is in soils with poor drainage.

Establishment and Maintenance

Plantings are established by sowing the seed or transplanting nursery grown, one-year-old seedlings. The best time to plant is in spring, just after the danger of killing frost is past. The seed coat is hard and should be scarified for successful germination. Mechanical scarification is preferable because of the simplicity of this method.

Natob Bicolor can be drilled into rows or broadcast. **If drilled, the seeding rate should be 2 to 4 pounds per acre and if broadcast, the seeding rate should be 5 to 10 pounds per acre at a depth of 3 inches. The seed must be inoculated at the time of seeding.** Unless the soil is fertile, apply 300 to 500 pounds per acre of 0-20-20 fertilizer before or at the time of planting. Widely spaced row plantings should be cultivated the first and second years to control weeds. Thereafter, the growth of lespedeza is sufficiently strong to prevent weed competition.

Clip the weeds on solid seeded areas the first year when they overtop the lespedeza. Be sure to clip above the tops of the lespedeza plants.

Management

Cutting back the plants has the effect of retarding seed maturity, which increases the risk of the plants becoming frost damaged before the seed matures. Seed ripening is characterized by a yellowing of the leaves, which usually begins by mid-September.

To insure continuously satisfactory growth and seed yields, a yearly application of fertilizer usually is necessary in the early spring. Use 100 to 200 pounds per acre of 0-20-20.

Shrub lespedezas reproduce only from seed and do not spread outside of the planting area. They are very palatable to livestock and are easily destroyed by domestic animals or even by heavy deer concentrations. They should be protected if used along pasture boundaries.

VA-70 Shrub lespedeza **(*Lespedeza thunbergii*)** **(Perennial)**

Uses

VA-70 lespedeza (*thunbergii*) is used for wildlife food and cover in hedges and border plantings. The seeds are a desirable fall and winter food for pheasants, bobwhite quail, and many songbirds. Rabbit and deer browse the foliage. Honeybees like the flowers and produce a quality honey from them. Like Natob Bicolor, the masses of late summer blooms are an attractive landscaping feature.

Characteristics

Related to Bicolor lespedeza, VA-70 Shrub lespedeza is an excellent shrub that grows 7 to 8 feet in height. A slow starter the first year, the shrub will produce seed in the second year. It provides excellent cover during the summer and winter months and is ideal for stream or ditch banks, the edges of woods, or small corners of hard-to-farm areas. It can also be used as a low hedgerow with other plantings on either side. VA-70 lespedeza has shown no indication of spreading into agriculture fields. It can be used alongside or in combination with other plants. A particularly productive combination for wildlife improvement is to use switchgrass and lespedeza as complementary plantings. The lespedeza provides excellent food and some cover, while the switchgrass remains standing most of the winter, providing quality cover. However, switchgrass should not be permitted to invade the bicolor stand. Bicolor lespedeza stands should remain relatively open at ground level.

Planting

Prepare a clean, firm, weed-free seedbed. The seed can be broadcast on a well-prepared area, followed by the use of a cultipacker or roller, or it may be drilled with a conventional grain drill or cultipacker seeder. **Seeding dates are from April 15 to May 15 with a direct seeding rate of 8 to 10 pounds per acre at a depth of 1/2 to 1 inch. A rate of 16 pounds per acre in mixtures is recommended for broadcast seeding.**

VA-70 is a legume, so you must obtain the appropriate fresh, viable inoculant. If weeds become a

problem, mow the weeds down to the height of the lespedeza. Once the VA-70 is established, weeds are seldom a problem. It is best to plant 1/8 to 1/4 acre plots with 300 feet in between.

VA-70 lespedeza grows well in all soil types except deep sand or extreme lime soils. The flowers appear in late summer and are pink to purple. The seeds are black. Seed maturity ranges from late September to early October. VA-70 lespedeza produces between 300 to 500 pounds of seed per acre per year. If switchgrass is seeded with this shrub, the establishment techniques discussed above should be used. Five to 7 pounds of switchgrass will provide a good mixture.

Apply fertilizer before or at the time of seeding. Fertilize according to soil test. If no test is available, apply 300 to 500 pounds per acre of 0-12-12 or 0-20-20 fertilizer. Lime to 6.5 if pH is below 5.5. Do not use a nurse crop when seeding.

VA-70 lespedeza can be planted no-till, but existing weeds and vegetation need to be killed prior to planting to eliminate competition.

Adaptation

VA-70 lespedeza can be used on soils that are droughty, well drained, or somewhat poorly drained. It does not do well in poorly drained soils. Seed maturity requires a growing season of approximately 160 frost-free days.

Management Recommendations

1. Weed control might be required the first year. This is best accomplished by mowing when the weeds are 18 to 24 inches tall and clipping them to the same height as the lespedeza.
2. Mow every three years in late winter to a height not less than 4 inches.
3. Control noxious weeds.

Amquail Shrub lespedeza (*Lespedeza thunbergii* Nakai) (Perennial)

Characteristics

The official name of this new lespedeza, "Amquail" thunberg lespedeza (*Lespedeza thunbergii* Nakai), indicates that it is a variety of (*L. thunbergii*). The "Am" in its name comes from its place of origin—the new lespedeza was developed by the Soil Conservation Service at the USDA Plant Materials Center near Americus, Georgia. "Quail" comes from the much-improved variety's ability to produce an abundance of hard-coated seeds that are the preferred winter food of quail. Hence the name "Amquail."

Amquail is related to Bicolor lespedeza (*Lespedeza Bicolor*) and is very difficult to distinguish from Bicolor in winter. Amquail is relatively new to Maryland, but appears to grow satisfactorily here. The perennial legume grows well and produces a generous amount of seed in the South. It will grow to a height of 6 to 8 feet, and produces an abundance of high-quality winter food for quail. Little browsed by deer, Amquail is especially recommended for planting in areas with dense populations of deer. It will produce seed in the second year and provide good cover during the winter months.

Individual plants of Amquail may contain up to eight or more stems. The stems rise from a crown-like stump near the ground. Young stems are purplish. For the most part, the flowers are rose-purple, but a few are white. Blooming is at a peak from mid-August to early September.

Most of the seeds are black, but a few are reddish or reddish-brown. Seeds ripen in October and early November. Some fall to the ground soon after they ripen. Others remain on the plant and are shed gradually during fall and winter. Amquail seeds are most valuable to quail from late December to early March when other foods are scarce or absent. Some coveys feed almost exclusively on Amquail in those months.

Advantages of Amquail

The development of Amquail is a major advancement in habitat management for quail in the Southeast--possibly the biggest since the introduction of Bicolor in the late 1930s and early 1940s. Amquail has one major advantage over most other shrub Lespedezas -- it is resistant to deer browse. This advantage far outweighs Amquail's few limitations.

Limitations of Amquail

Two years are usually required for Amquail to become a dependable producer of seed. Like Bicolor and other shrub lespedezas, Amquail is easily destroyed by livestock. For that reason, it should not be planted where livestock will have access to it.

It does not thrive on wet, waterlogged soils and does not grow well on deep, fine sands or highly alkaline soils. However, it does grow better on sandier soils than Bicolor and other shrub lespedezas. Like other shrub lespedezas, Amquail starts spreading after ten to twelve years, especially on heavier soils that are prescribed burned in winter.

Fire causes Amquail and other shrub lespedezas to spread on heavier soils. The exact reason for this is unknown, but we do know that fire breaks the hard coat of seed on the ground. This allows moisture and oxygen to enter the seed, a condition that favors germination. Fire also removes a good bit of organic matter from under the shrub lespedezas. That allows more of the seed to be in contact with bare soil, which also favors germination. It appears, therefore, that these two factors are primarily responsible for the spread of shrub lespedezas after several years of prescribed burning.

Why is the spreading more noticeable on heavier soils? It might be because more of the seedlings survive on the heavier soils, which usually contain more moisture near the surface than do sandier soils. Seedlings require a good bit of moisture in order to survive, especially during their first few weeks.

Even though Amquail has a tendency to spread after ten to twelve years, it usually does not become a pest. It does not spread into cropland or pastureland. Its spreading can be controlled by grazing in spring, summer, and fall. Grazing by livestock at that time completely eliminates Amquail, Bicolor, and the other shrub lespedezas.

Planting

Use the same planting procedures used for Bicolor Shrub lespedeza. As stated above, Amquail does not thrive on wet, waterlogged soils; deep, fine sands; or grow well on highly alkaline soils. However, it does grow better on sandier soil than Bicolor or other shrub lespedezas.

Other Considerations

If you want to provide winter food for quail on an area that occasionally will be prescribed burned and you are concerned about the spread of Amquail, Bicolor, and other shrub lespedezas, consider planting Partridge Pea (*Cassia fasciculata*) or Kobe lespedeza (*Lespedeza striate*), or both.

Partridge Pea grows well on both sandy and clay soils. Kobe lespedeza should only be planted on heavier soils. Neither is browsed by deer to any appreciable extent. Both reseed every year, especially if prescribed burned in February every two to three years. In fact, they reseed better if prescribed burned every February. Neither Partridge Pea nor Kobe lespedeza grow as tall as Amquail and other shrub lespedezas, and neither will become a pest. Both are easy to control--stop prescribed burning and, after a few years, Partridge Pea and Kobe lespedeza will disappear.

NONSHRUB LESPEDEZAS (LOW-GROWTH FORM)

Sericea lespedeza (*Lespedeza cuneata*) (Perennial)

Characteristics

Sericea lespedeza is an upright-growing perennial, 3 to 5 feet tall, with excellent cover and feed production abilities. Sericea should be planted in strips, patches, or next to taller shrubs, hedgerows, or at the edges of woods. Seed production usually will not occur until the second year. There are several

superior cultivars: 'Interstate', 'Appalow' (a low-growing form), 'Caricea', and 'Seriala'.

Planting

Start with a clean, firm, weed-free seedbed. **Plant seed shallow (0 to 1/2 inch) at the rate of hulled and scarified seed (i.e., 10 to 20 pounds per acre in mixtures). Increase the rate by 10 to 15 pounds per acre for unscarified or unhulled seed as soon as the soil can be worked in the spring (March until May).** Because lespedeza is a legume, you will need to obtain the appropriate flesh, viable inoculant from your seed supplier (lower pH limit is 4.5). Apply 50 to 100 pounds of both P₂O₅ and K₂O prior to planting, as you would to most legumes.

Comments

Major uses for *Sericea lespedeza* include watershed protection (long-term cover), aesthetics, and forage. Stand establishment is relatively slow, so the stand area should be sown with a quick-cover grass. In a mixture with grass, *Sericea lespedeza* usually becomes the dominant species in three to four years and forms dense stands that retard the natural invasion of other plants. Considered low in value for wildlife by most biologists, *Sericea lespedeza* nevertheless benefits tree growth in combination plantings, provided the trees are able to grow above it. Stands are weakened or eliminated when shaded by forest species. *Sericea Lespedeza* provides long-term or permanent cover that requires little or no maintenance.

Appalow *Sericea lespedeza* (*Lespedeza cuneata* Appalow)

Characteristics

Appalow *Sericea* is basically the same as *Sericea* except it has a prostrate or low lateral growth habit of about 10 to 12 inches in height. Appalow is an excellent producer of seeds and provides a low, dense cover ideal for quail.

Planting

Seed early spring no later than May at the rate of 16 pounds per acre with a planting depth of 0 to 1/2 inch. Prepare the soil as for *Sericea* and use lespedeza inoculant.

Korean lespedeza (*Lespedeza stipulacea*) (Annual)

Characteristics

Lespedeza stipulacea reseeds readily and is well adapted to a wide range of temperatures, thus, it can be used as a long-term component of vegetative cover. Stipulacea provides an early or quick legume component in spring-sown grass-legume mixtures. Plant residue provides poor ground cover in winter. Stipulacea is more sensitive than Sericea and Kobe lespedeza to excess soil manganese and soil acidity. The seed is a preferred food of quail. Similar to Kobe lespedeza, Stipulacea produces high quality hay, but has a shorter growing season and can be used farther north. It generally is not recommended for the northernmost parts of the Appalachian region and interior regions of Maryland. Stipulacea's major uses include wildlife food, forage (hay and pasture), forestry (companion legume with trees), and watershed (early cover).

Planting

Seed at a rate of 6 to 12 pounds per acre in mixtures or 10 to 25 pounds per acre alone. Plant shallow at a depth of 0 to 1/2 inch. The rate of establishment is moderate to rapid; the lower pH limit is 5.0. **Planting should occur in early spring (February to March).**

Common lespedeza

(*Lespedeza striate*)

Kobe lespedeza

(*Lespedeza striate* var. *Kobe*)

Characteristics

Common lespedeza (also called Japanese lespedeza, Japanese clover, and striate lespedeza) has a low-growth form and does not produce as much herbage as the improved variety, Kobe. Kobe is the most widely used and most familiar cultivar of common lespedeza. Similar to Korean Lespedeza in growth form, Common lespedeza matures later and is not adaptable as far north, but it is more tolerant of high levels of manganese in the soil than Korean lespedeza. Reseeding readily in its adapted climatic range, Common lespedeza generally is used to quickly establish a legume in mixtures with grasses or with grasses and perennial legumes. Common lespedeza is recommended as a ground cover species for use with pine in the Southern Pine region. Growth stops after the first killing frost and the cover value of plant residue diminishes as winter progresses. Major uses of Common lespedeza include wildlife food, forage (hay and pasture), and forestry (companion legume with trees).

Planting

Seeding rate is 8 to 15 pounds per acre in mixtures and 20 to 40 pounds per acre alone from February to March. Planting depth is 0 to 1/2 inch. The lower pH limit is 4.5. The elevation limit is 2,000 feet at the northern limits of its range. Superior cultivars include Kobe.

AGRICULTURAL FOOD AND COVER PLANTINGS

Trailing soybean (Annual)

Characteristics

Trailing soybean has the desirable characteristic of climbing stiff-stalked plants. Sometimes, it will reseed itself. Grain sorghum (milo), corn, and sunflowers work well as support plants for these bean varieties. Most of the vines will be held off the ground, providing both cover and food during periods of snow. The seeds are about half the size of standard soybeans.

Planting

Plant trailing soybean like any other soybean. Because seeds are small, plant at a rate of **25 pounds per acre in rows or at 40 to 50 pounds per acre if broadcast. Plant from May 15 to July 15 at a depth of 1 to 3 inches.** Corn, milo, or sunflowers, if included, should compose 30 to 60 percent of the mix. Fertilizer should be applied as if planting regular soybeans.

Partridge pea (*Cassia fasciculata*) (Annual)

Characteristics

Partridge Pea is an annual reseeding plant when managed properly. It is a legume, native to Maryland, with a beautiful yellow flower. The seed is a favorite quail food, and rabbits devour the stalks during the winter. It grows well mixed with natural weeds and grasses, but can also be planted in pure stands. The pH should be between 5.5 and 6.5. In the absence of a soil test, apply fertilizer at a rate of 50 to 100 pounds of P_2O_5 and K_2O prior to planting.

Planting

Plant the peas April to June 1. Disk the soil to remove and bury existing vegetation. **Sow at the rate of 12 to 20 pounds per acre at a depth of 1/2 to 3/4 inch.** The following spring, disk the same area again lightly, or administer a light prescribed burn in February to encourage the Partridge Pea to reestablish.

White Clover

(*Trifolium repens*)

Ladino Clover

(*Trifolium repens* L)

Characteristics

Common white clover is used for pasture throughout the eastern United States. However, it is primarily used for wildlife habitat and forage to provide diversity in species composition, especially in food patches or openings planted for wildlife. Common white clover should be planted with grasses and other legumes. Planted alone, it provides inadequate ground cover during the winter. Due to its peculiar growth and reproductive habits, there is no assurance of stand persistency from year to year. Although common white clover is usually considered a perennial, much of the new growth each year volunteers from seed. Ladino, a large form of white clover, is the most widely sown cultivar for use as hay and pasture.

Planting

Seed at a rate of one to two pounds per acre at a depth of 1/4 to 1/2 inch from February to April 1 and August 15 to September 15. The lower pH limit is 5.5. 'Ladino', 'Regal', and 'Tillman' are a few of the superior cultivars. Fertilize with 50 to 100 pounds of P_2O_5 and K_2O at planting. Common white clover should be mowed once during summer to promote growth for fall.

General Comments on Poultry Manure as a Fertilizer

Manure is a good cheap fertilizer source, but it should be analyzed to ensure proper rates. Manure testing and recommendations can be obtained from your county Cooperative Extension office.

The average nutrient content of broiler litter samples is listed in the following chart in pounds per ton at 22 percent moisture (average moisture).

Nutrients	lb/ton
Total N	86
NH ₄ -N	16
P ₂ O ₅	68
K ₂ O	41
Ca	31
Mg	16

S	11
Mn	1
Zn	1
Cu	1

Other than nitrogen, most of the nutrients are available the first year. The ammonium nitrogen will be lost unless the manure is incorporated, snowed on, or rained on. Under normal weather conditions, the ammonium will volatilize away in six days. Therefore, if the manure is incorporated or if it rains three days after application, half the ammonium will be lost. The remainder of the nitrogen becomes available over a period of time.

In most cases, 2 tons per acre of average poultry manure will supply sufficient nutrients to meet the needs of wildlife cover crops.

WARM AND COOL SEASON GRASSES

Characteristics

The growth habits and attributes of the warm season grasses recommended in this section include

- a strong root system to hold the soil;
- growing in bunches (these are not turf-forming grasses, such as fescue);
- remaining standing throughout the winter, providing cover for wildlife as well as filtering sediment from runoff;
- growing well on low fertility soils; and
- in some cases, such as eastern gamagrass, providing high quality pasture forage and hay. (Pasture use must be carefully controlled to protect nesting birds.)

In general, warm season grasses are not considered high quality forage, except for eastern gamagrass. Their main attribute as forage is that they produce 1 1/2 to 2 times the yield of cool season grasses, even in low fertility sites.

However, warm season grasses are able to provide forage during the summer slump when cool season grasses are not productive.

Warm season grasses are slower to establish than the more familiar cool season grasses traditionally planted, so be patient. It may take two growing seasons for a grassy area to fully establish itself. Once a stand is established, the benefits of low maintenance, long stand life, increased wildlife, and improved water quality (when part of a riparian forest buffer) far outweigh the extra initial effort.

In general, native, warm season grasses are not especially shade tolerant. A possible solution when planted next to a forested area (as with a riparian forest buffer) is to incorporate a shrub transition area between the grasses and the trees.

Site Preparation

Proper site preparation is critical to the success of any planting. Remove existing vegetation by herbicide use, cultivation, or a combination of the two. Soil test sites and bring fertility up to medium level for phosphorus and potassium. Do not apply nitrogen to warm season grass planting sites. Nitrogen will only stimulate weeds that could dominate the warm season grass seedlings. Finally, pH levels should be between 5 and 8 for warm season grass plantings. If necessary, apply lime as indicated.

Existing Turf Fields

A) Applying herbicides: Use a nonpersistent, glyphosate-based herbicide such as Roundup. Follow manufacturers' instructions.

- Apply in previous fall and in mid-spring for spring plantings.
- Apply once in early fall for fall planting.
- Till soil and plant. Remove dead sod to create smooth seedbed.

Existing Agricultural Fields

A) Applying herbicides: Spray once in mid-spring for spring planting, or once in early fall after removal of crop for fall planting. Till soil and plant, or use no-till seeder and plant directly into soil.

B) Cultivation: Work up seedbed as for any other crop. If rhizomatous perennials are present, work up soil all year, as recommended in section "Old Fields." After the existing vegetation is removed, the seedbed should be prepared by tilling or disking, and then dragging or raking smooth. Properly prepared seedbeds will be smooth and free of large clumps.

Old Fields

A) Applying herbicides: Mow in early spring, then spray twice, once in mid- to late- spring and once in early fall. Till soil after final spraying and plant, or use no-till seeder and plant directly into dead sod.

B) Cultivation: Prior to planting, cultivate soil 4 to 6 inches deep periodically throughout the growing season to kill rhizomatous perennial weeds. After the final cultivation late in the year, a dormant fall seeding can be made. If further weed control is desired, the planting can be done the following spring, allowing for light surface cultivation to kill weeds prior to spring planting.

Planting

With few exceptions, warm season grasses should be planted using a specialized warm season or rangeland grass planter or drill. In fine soils, all species should be drilled as shallow as possible, 1/4 to 1/2 inch, except eastern gamagrass, which should be planted 3/4 to 1 inch. In coarse, sandy soils, it is recommended that all species be planted 3/4 to 1 inch, except for eastern gamagrass, which should be planted 1 to 1 1/2 inch. Seeds tend to dry out and not germinate if planted too shallow in these sandy soils. Planting seed any deeper will prevent adequate germination. If a drill is not available, clean seed can be broadcast or drop-seeded (with a cultipacker seeder) onto a firm seedbed, except for eastern gamagrass, which needs to be drilled.

Fall Planting--Plant from early September to first freeze

Generally it is not recommended to fall plant any of the warm season grasses, except for eastern gamagrass. The cool season grasses, as well as the eastern gamagrass, can be fall planted after the first killing frost.

Advantages:

1. Seed over winters and comes up in spring when conditions are right.
2. In general, forb seed has greater germination.
3. Recommended for planting on droughty soils, because seeds germinate when soil moisture levels are optimal.

Disadvantages:

1. Grass seed often has poorer germination.
2. Because weeds will have a head start the following spring, there is limited opportunity for early season weed control by cultivation.
3. It is NOT recommended for clay soils, due to difficulty in preparing a proper seedbed after dry summer months.

Early Spring Planting--Plant from March to April

Advantages:

1. Forbs will germinate better than those planted in late spring.
2. Grass seeds will germinate better than those planted in fall.
3. Droughty soils should be planted as soon as possible in spring, if it is not possible to plant in fall.

Disadvantages:

1. Limited opportunity for early, cool season weed control.
2. It is NOT recommended to plant heavy soils in early spring, because it is difficult to work these soils.

Late Spring Planting--Plant from May to end of June

Advantages:

1. More time for soil preparation. This is important for planting on heavy soils.
2. Longer time for weed control.
3. Best time to plant warm season grasses.

Disadvantages:

1. Increased chance of drought conditions.
2. Overall, poorer for germination, except for warm season species. Many cool season species will not germinate until fall or the next spring. This allows the weeds a one-year head start.

Broadcast Planting

Broadcast planting includes spreading seed with fertilizer spreaders, other spinner-type seeders, and drop-seeders. Warm season grass seeds are light and fluffy because of attached "parachutes" that facilitate wind dispersal. For successful broadcast planting, the seed needs to be clean. This means seed that it is at least 75 percent pure-live seed (75 percent PLS) and/or debearded. Seed that is less than 75 percent PLS should only be planted with a specialized warm season grass drill or planter.

When broadcast seeding, extreme care must be taken to ensure good seed-to-soil contact while limiting maximum seed depth to 1/4 to 1/2 inch. Seed should be rolled lightly after seeding. However, do not be concerned about covering all of the seed. In fact, it is better to leave some on the surface rather than cover it too heavily.

Planting Steps

1. Prepare soil for planting by tilling (plow, disk, and drag). Raking or dragging will loosen the soil to allow incorporation of the seed into the surface soil.
2. Inoculate legume seeds prior to planting. Mix inoculated legume seeds with forb/wildflower seeds. These can be mixed together with the grass seed to form a uniform mix. Plant the mixed seed.
3. Drag lightly and firm with a roller or cultipacker; avoid firming soil when wet.

Note: On steep slopes, it is often beneficial to plant a quick-germinating nurse crop and/or mulch the planting.

Post-Planting Maintenance (Warm Season Grasses)

Year One. If straw mulch is used, control annual weeds by mowing to 4 to 6 inches in the first year. Invading weeds can dominate the planted grass seedlings by depriving them of water, light, and space. Do NOT let weeds get higher than 12 to 14 inches before mowing. Cutting down tall weeds can smother the grass seedlings below. If wildflowers were included in the mixture, do not mow lower than 8 to 12 inches.

If a nurse crop is used, do not mow in the first year, unless weeds become a serious problem. If weeds are dense and begin to grow up to 16 inches, cut them down along with the nurse crop to prevent shading-out of desired grass seedlings.

Year Two. Once your stand has established itself, prescribed or controlled burning is the most effective method of maintaining and rejuvenating a stand of warm season grasses. Burn one-third of your total grass acreage every year. Controlled burning will ensure a cleaner, more valuable stand over a longer period of time. Burning is much easier and less expensive than you might think; however, permits are required and great care must be taken during the burning. Contact your local county Forester (MD-DNR Forest Service) for permits and assistance.

Haying or grazing at the proper times, using proper methods, can also help maintain a stand. Cut hay or graze to a minimum height of 6 inches. It is important to rotate mowed or grazed areas on an annual basis. Avoid, if possible, haying or grazing any stand during the peak nesting period between April 15 and August 15. Disturbances during this time period are detrimental to the reproductive success of the area's wildlife.

Note that certain management practices, such as haying or grazing, are restricted under USDA programs such as the Conservation Reserve Program. Contact your local NRCS (Natural Resource Conservation Service) or Farm Service Agency for details.

You can mow your grass to maintain it; however, this is not the most desirable option. Once it is established, mow one-third of your stand every year. Mowing will keep woody growth from encroaching, but repeated mowing will create a layer of "litter" on the ground. This mulch layer will eventually crowd grass seedlings. The mulch also makes it difficult for young birds to move on the ground and makes the stand less attractive to insects they eat. If you do decide to mow, it might be necessary to lightly disk the stand every three or four years to turn over the litter layer, destroy woody growth, and encourage dormant grass seed and native annuals.

It is important to understand that you are required by law to control noxious weeds, including Johnsongrass, jimsonweed and Canada thistle, on your property. Should you encounter these species

in your plantings, your first priority should be control of these weeds, even at the expense of the planted grasses. Contact your county weed control specialist for more information.

Nurse Crops

Annuals or short-lived perennials that provide rapid soil stabilization and help keep weeds down without competing with the grass/forb seedlings are called *nurse crops*. Nurse crops can be planted at the same time as the grass/forb seed. Mix the nurse crop seed with the grass/forb seed and hand broadcast together. On large plantings, oats can be drilled prior to, or after, seeding.

Oats: Apply at a rate of 50 pounds per acre in spring plantings. Use 100 pounds per acre in mid-autumn plantings, because it will winterkill. Heavier seeding rates ensure better soil holding ability.

Wildlife Habitat Seeding Recommendations

Native Warm Season Mixtures (rates are per acre)

Mix 1: Upland/Dry Soils

- 3 Ibs. Indiangrass (*Sorghastrum nutans*)
- 2 Ibs. Big bluestem (*Andropogon gerardi*)
- 1 Ib. Little bluestem (*Schizachyrium scoparium*)

Mix 2: Lowland/Moist Soils

- 3 Ibs. Big bluestem (*Andropogon gerardi*)
- 2 Ibs. Indiangrass (*Sorghastrum nutans*)
- 1 Ib. Switchgrass (*Panicum virgatum*)

Individual Stands:

Rates for seeding pure stands of individual grasses from the above-mentioned mixtures:

- 7-15 Ibs. Big bluestem (*Andropogon gerardi*)
- 7-15 Ibs. Little bluestem (*Schizachyrium scoparium*)
- 7-12 Ibs. Indiangrass (*Sorghastrum nutans*)
- 5-12 Ibs. Switchgrass (*Panicum virgatum*)

Listed below are other grasses that can be used for both wildlife habitat and sediment filtering in a grassy buffer strip. Except for eastern gamagrass and coastal panicgrass, these are cool season, non-natives adapted to this area and utilized by wildlife. **The seeding rates given are per acre for pure stands.**

- 8 lbs. Coastal panicgrass (*Panicum amarum* var. *amarulum*)
- 7 lbs. Eastern gamagrass (*Tripsacum dactyloides*)
- 6-8 lbs. Reed canarygrass (*Phalaris arundinacea*)
- 4-25 lbs. Perennial ryegrass (*Lolium perenne*)
- 4-6 lbs. Orchardgrass (*Dactylis glomerata*)
- 3 lbs. Weeping lovegrass (*Eragrostis curvula*)

In addition to the grasses recommended above, it is a good idea to include a variety of forbs or wildflowers. Plant a premixed variety at a rate of 1/4 pound per acre. The following is a partial list of native species:

- Black-eyed Susan (*Rudbeckia hirta*)
- New England aster (*Aster novea angliae*)
- Laceleaf coreopsis (*Coreopsis lanceolata*)
- Ox-eye sunflower (*Heliopsis helianthoides*)
- Partridge Pea (*Cassia fasciculata*)

WARM SEASON GRASSES

Switchgrass (*Panicum virgatum*)

Switchgrass (*Panicum virgatum*) is a tall perennial warm season grass, which is native to the eastern and central United States. It is slow to establish, but once established Switchgrass competes well with other grasses and brush, especially at low fertility (lower pH limit 4.0 to 4.5). A good seed producer, Switchgrass provides both good nesting cover and winter cover with its stiff stalks. Switchgrass spreads by tillers and short, scaly rhizomes. Mature stands appear to be clumps of plants rather than continuous sod. The ability of Switchgrass to remain standing through the winter has proved superior to any other grasses tested. Two to three years of careful management are needed to establish a good stand of Switchgrass. However, once established, and with proper management, a stand will last for twenty years or longer.

Being a warm season grass, it does not begin growth until late April or early May. The most vigorous growth occurs from late June through the end of August. The seed heads appear during August, then ripen in late September. With the first hard frost, switch grass falls dormant, and the aboveground plant parts turn yellow-brown.

It is important to be able to recognize the young seedlings. Many plantings have been plowed under because landowners thought the seeding had failed, when actually, there was a good stand of seedlings present.

Identifying characteristics of Switchgrass:

1. A relatively stiff stem.
2. Plants grow as clumps rather than continuous sod.
3. The presence of straight white hairs on the top side of the leaf near the collar where the leaf blade joins the sheath.

Wildlife Uses

In Maryland, Switchgrass is recommended as nesting cover and winter cover for pheasants, quail, rabbits, and songbirds. It also provides good protective cover for upland game and is well suited for use on shooting preserves. The young sprouts are a source of food for wild turkeys and rabbits. It may also be used as nesting cover by waterfowl.

Soil Conditions Suitable for Planting

It is preferable to plant switchgrass on well- or moderately well-drained soils. Slightly well-drained and excessively well- drained soils are acceptable for planting, but are less desirable. Results are less dependable on somewhat poorly drained soils because, in addition to poor growth, frost heaving is a problem. Switchgrass should not be planted on poor or very poorly drained soils or on excessively well-drained sands. The pH of the soil should be 5.5 or above.

Planting Recommendations

Kill perennial weeds and prepare a clean weed-free seedbed. **Plant seed with a drill or grass seeder 1/4 inch deep. In loamy soils, seed should be planted 1/2 to 3/4 inch deep.** In silt loams and clay loams, the depth should not exceed 1/2 inch, but should be at least 1/4 inch deep. Surface or broadcast seeding might reduce germination unless followed with a cultipacker to firm the soil over the seed. Some nurseries will provide seedlings as well as seed. Seeding should take place late- April through early June. The soil must be warm (65°F or warmer) in order to encourage rapid germination so that weed competition does not become too damaging. If weeds become a problem they should be mowed to the height of the switchgrass, but no closer than 4 to 6 inches from the ground. Do not cut or mow switchgrass plants during the first year's growth. Once established, stands require little or no maintenance except occasional burning where left solely for cover.

Seeding Rates

Rates are based on pounds of Pure Live Seed (PLS) at 100 percent purity and a 100 percent germination rate. Order seed in terms of PLS. You will receive more seed than ordered because of the particular percent germination and purity of the seed lot.

Seeding Technique	Lbs. PLS Per Acre	Lbs. PLS per 1,000 Sq. Ft.	Number of PLS Seeds per Sq. Ft.
No-till	10	.23	90
Drilled	8	.18	70
Broadcast	10	.23	90

Order 2 to 5 pounds extra to allow for spillage and planter box loss. To determine the actual pounds of seed to be planted per acre, use the following formula:

$$\frac{\text{Ib. PLS/acre recommended}}{\% \text{ germination} \times \% \text{ purity}} = \text{lb. of seed to plant}$$

Example:

If you want 10 Ib/acre and the seed tag reads 75% germination, 80% purity, then your formula would be:

$$\frac{10}{75\% \times 80\%} = 16.6 \text{ Ib. seed to plant to end up with 10lb/PLS}$$

Eastern Gamagrass (*Tripsacum dactyloides*)

Characteristics

Eastern gamagrass is a native, perennial, warm season grass that grows 6 to 8 feet tall. It does best in moderately well-drained to somewhat poorly drained soils. It will tolerate extended periods of flooding. Once developed, its roots can extend down 8 to 10 feet into the soil profile. Eastern gamagrass is the most palatable and nutritious warm season grass. It is primarily used for forage and hay production and is very valuable wildlife food and cover. It is not alkaline tolerant. It is not recommended to include in seeding mixtures with other warm season grasses.

Eastern gamagrass seed looks similar to small corn seed and is best planted with a corn planter. The seed must be stratified prior to planting. This is the only warm season grass that can be planted in both fall and spring. Fall-plant after the first major frost. The seed needs three to four cold months to break dormancy. The recommended cultivar is 'Pete', which can be used for wildlife habitat enhancement, forage, and hay production.

Little Bluestem **(*Schizachyrium scoparium*)**

Characteristics

Little bluestem is a native, perennial, warm season grass. It is good for wildlife habitat improvement. It grows to a height of 2 to 4 feet, depending on site conditions. In the Northeast, it is usually found in fallow fields, roadsides, and rights-of-way. Little bluestem is the most drought tolerant of the warm season grasses. It is fair to excellent for acid tolerance. Once developed, its roots can extend down 3 to 4 feet in the soil profile. Usually sown in mixtures with other native grasses. The seed of Little bluestem is very fluffy and will only move through grass drills equipped with a fluffy seed box.

Cultivars available are 'Aldous', 'Camper', and 'Blaze'. 'Aldous' is leafy, vigorous, and shows some resistance to rust. It produces abundant forage. 'Camper' is a long-lived perennial forage with maximum production in mid-summer. 'Camper' can be used for forage production, wildlife habitat enhancement, or critical area stabilization. 'Blaze' is leafy and late-maturing. The foliage turns red in the fall. It is primarily used in conservation plantings.

Big Bluestem **(*Andropogon gerardii*)**

Characteristics

Big bluestem is a native, perennial, warm season grass. It grows 6 to 8 feet tall. It is deep-rooted (8 to 10 feet) and will grow on droughty, low fertility, and acidic soils. It is the most drought-tolerant of all the warm season grasses. It prefers sites with full wind and sun exposure. In the Northeast, it is commonly found along railroads, stream banks, and roadsides that are infrequently mowed. Leaf tips and stems often have some bluish or purple color even during the growing season. The seeds of Big bluestem are very fluffy and must be planted with a warm season grass or "native seed" drill equipped with a fluffy seed box.

There are many cultivars available ('Niagara', 'Kaw', and 'Roundtree'), but the recommended cultivar is 'Niagara'. 'Niagara' is used for forage production, land reclamation, and wildlife habitat enhancement.

Indiangrass **(*Sorghastrum nutans*)**

Characteristics

Indiangrass is a native, perennial, warm season grass. It grows 3 to 8 feet tall depending on site

conditions. Indiangrass is one of the more beautiful native grasses. The panicle is bronze to yellow in color and can grow to 8 to 12 inches long. Indiangrass can be used to provide food and cover for wildlife, erosion control, forage, and hay production. It is very acid-tolerant. Indiangrass is difficult to establish in pure stands and is best used in mixtures. The seeds of Indiangrass are very fluffy and must be planted with a warm season grass or "native seed" drill.

There are many cultivars available ('Rumsey', 'Oto', and 'Holt'), but 'Rumsey' is the best suited for the Northeast.

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Wildlife Plantings Food and Cover Plantings Shrub Lespedezas

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