Seeding Aechynomene in Bahiagrass Sod

R.S. Kalmbacher[1]

Introduction

If a Florida rancher wants to grow a grass and legume together for summer pasture, it will be bahiagrass and aeschynomene, respectively. It's certain that bahiagrass will always be available in the pasture, but aeschynomene is not so dependable. The problem is that it is an annual and must start from seed each year. Just when and how much aeschynomene you get depends on many factors, the most important of which the rancher has little or no control over. Growing aeschynomene-compared to nitrogen fertilization or bahiagrass-involves risk, but the risk can be minimized. The purpose of this presentation is to review the recommended steps for establishing aeschynomene in bahiagrass.

Steps for Establishment

1. **Site selection** is a major consideration, paticularly soil drainage. Aeschynomene grows well on soils with poor internal drainage, but soils with surface drainage are needed. Water can not stand on the soil surface for several days. This is especially important during establishment of aeschynomene. In contrast, avoid excessively drained soils (sand ridges) where establishing aeschynomene would be very difficult. Also select soils with better natural fertility. Most ranchers have recognized one or more fields where "the grass grows better," and these should be seeded with aeschynomene rather than the field with poorer fertility.

2. **Liming** before seeding is important because the grower needs to have the site in a condition that is favorable for aeschynomene growth. Lime as needed to bring the soil pH up to 5.5 to 6.5, and if these soil pH values are obtained, then plant calcium needs will also be met. It may be good practice to apply dolomitic lime to supply magnesium.

3. **Fertilization** should be delayed until a successful seedling stand is established. Hold-off fertilization at the time of drilling or when disking to regenerate aeschynomene. After seedlings are two to three weeks old, fertilize with 300 Ibs/A of an 0-10-20 fertilizer. Micronutrients deficiencies will normally not be a problem on pasture if they have been applied in the past. A safe approach would be to apply 20 1b/A of a mixture such as F 503[2].

4. **Seeding date** must be chosen carefully. The greatest reason for stand failure of aeschynomene is inadequate soil moisture at or shortly after seeding. I emphasize that **seeding date and it's relation to soil water is the most critical factor in establishing aeschynomene.** The problem occurs when there is adequate moisture for germination, but not enough soil water to carry legumes from one shower to next. One way to overcome this is to seed or lightly disk to stimulate aeschynomene regeneration when the chance for continuous good soil water is greatest.

Seventeen seedings of aeschynomene were made at the Ona AREC in south central Florida from May to late June 1981 to 1985, and six of these seedings were failures because of insufficient water. Failures due to drought always followed abnormally dry February to May periods when less than the average 11 inches of rain fell. Even with 1 inch of rain on the day of seeding (drilling), the seedbed dried out faster than the seedlings could establish. When there is a good reserve of soil moisture at seeding; soil dries more slowly, giving aeschynomene longer to establish, thus seedlings are larger and have a better chance of survival if drying occurs.

The six seedings that failed in the 5year Ona AREC trial were all May seedings. By waiting until after June 1st the chance of rain is better. By using Quincy data (41 yr averages) as an example for north Florida, the chance of no rain in the first week of June is 9%; the chance of 0.5 inch or more is 66%; the chance of 1.0 inch or more is 45%. Probabilities of rain improve through June which increase the chance of stand success. In most cases it is best to seed after June 1st, especially after a dry winter and spring.

5. **Seeding rates** should be slightly higher when seeding into sod. In a prepared seedbed use de-hulled (scarified) aeschynomene seed at 5 lb/A, but 6 to 8 lb are recommended for bahiagrass sod-seeding. Higher rates are recommended because of the great seedling losses from insects, snails, drought, disease, etc. For example, when aeschynomene was seeded in June 6 lb/A in a grazed sod, there were 11 seedlings/ft^2 at 8 days after seeding; 9 seedlings/ft^2 after 15 days and 5 seedlings/ft^2 after 31 days. By October the number averaged slightly greater than 3 seedlings/ft^2, which was a dense stand.

When seedings are made before June 1st or on a seedbed that tends to be dry, seed 25 lb/A of non-hulled seed. Again this rate is higher than the 10 lb/A recommended for prepared seedbeds. Germination percentage is usually 1 to 10% on non-hulled seed, but the hard-seed percentage can range from 40 to 70%. If conditions are good, a stand should result from easily germinated seed, but if conditions for germination are poor or if the initial stand fails, a reserve seed source is available from the hard seed. Mixing dehulled with non-hulled seeded (viz. 1:4 ratio) has been satisfactory.

6. **Inoculate seed** with fresh *Rhizobium* bacteria (cowpea group) that are specific for aeschynomene the first time the crop is seeded in a field where it has never been grown. Covering the seed helps assure longevity of bacteria. Once aeschynomene has been grown on a field, there is not reason to re-inoculate.

7. **Manage bahiagrass before seeding aeschynomene** to enhance success. In order to minimize competition problems for establishing aeschynomene, no nitrogen (N) should

[1]R.S.Kalmbacher, Agric. Res. and Educ., Ctr., Ona, FL33865 (Dept. of Agronomy, Inst. of Food and Agric. Sci., Univ. of Fla., Gainesville, FL 32611).

[2]F-503 is an oxide form containing 3.0% B, 3.0% Cu. 18.0% Fe, 7.5%Mn. 0.2Mo, and 7.0%

be applied to the bahiagrass after the fall preceding spring seeding of aeschynomene. Remove excess bahiagrass cover before seeding to assure that emerging aeschynomene seedlings have adequate light. A dense canopy of 8 to 12 inch tall bahiagrass reduces the amount of light reaching seedings and this results in poorer stands of aeschynomene. When aeschynomene was seeded into bahiagrass without controlling canopy height. an average of 36% of the total sunlight was able to get through the grass-leaf cover during the first 4 weeks after seeding. Bahiagrass that had been disked or grazed to 3 inch height prior to seeding allowed an average of 60% of the light to reach the seedings. Yield of aeschynomene over a 3-year trial period averaged 2,050 lb/A where bahiagrass was grazed before and during aeschynomene developement, but yield was 1200 lb/A where aeschynomene was seeded into ungrazed bahiagrass.

Grazing is a practical method of removing excessive bahiagrass. Concentrate cattle in late winter-early spring to graze bahiagrass to 2 to 3 inches. Grazing has an advantage over methods of canopy removal like mowing because repeated defoliation reduces the vigor of bahiagrass such that it will not regrow rapidly after cattle are removed. Control of cattle after seeding will be discussed shortly.

Burning can be useful for establishing aeschynomene. When excess bahiagrass is burned-off after grazing in late winter and spring, aeschynomene seed germination and seedling vigor is enchanced. especially when bahiagrass regrowth is controlled by grazing. However, the practicality of this is limited because there is usually not enough fuel after winter grazing to carry a fire. Unless burning takes place before spring green-up, the pasturc will not burn well.

Research has shown good stands of aeschynomene can be obtained when bahiagrass is burned before seeding aeschynomene. The amount of aeschynomene and aeschyoment-bahiagrass mixture quality that resulted from burning and seeding were similar to yield and quality of grazing bahiagrass and seeding aeschynomene.

Herbicides applied for the specific purpose of controlling bahiagrass growth are not recommended. Numerous herbicides have been tested for establishing summer legumes, and there are herbicides that will stop bahiagrass growth, but a large grass canoy (dead or alive) can result in excessive shade, and yields are not always improved. The canopy must be removed, and then legume yield can be improved with herbicides which limit grass growth. However, cost is a limiting factor that weighs against the use of herbicides for canopy control.

Disking is an effective method of canopy removal. but establishment of aeschynomene is often poorer than use of grazing to remove excess grass. The reason is loss of seedbed moisture. Even with a light disking, which is all that is necessary, the soil surface is disturbed and exposed to the sun, drying the surface.

8. **Method of seeding** is of lesser importance if a good job of controlling grass competition and adequate water and fertility are available. Several commercially available sod-seeding drills have all proved to be good, which makes machine selection a personal and economic matter. Regardless of the drill used. place aeschynomene seed at 1/2 to 3/4 inch below the soil surface into the moisture. Seeding too deep in Florida's dry. sandy soils is much less of a hazard than seeding too shallow.

Disking the soil and broadcasting seed, followed by cultipacking does not have consistent success unless irrigation is provided. Disking removes the grass canopy, but results in poor seedbed moisture. Yields of aeschynomene seeded by disking and broadcasting can be similar to aeschynomene yields from drilling when continued rains occur after seeding aeschynomene. Better seed-to-soil contact through the use of a drill results in better stands of non-irrigated legumes.

9. **Manage bahiagrass after seedling establishment** to promote good stands. graze after legume emergence to keep bahiagrass about 3 inches tall. Remove cattle from the pasture when seedlings reach about 2 inches tall, so that they do not graze the tops of the acschynomene seedings. Allow grazing to resume when aeschynomene is 18 inches tall.

Aeschynomene should reestablish itself each year once a seed source is built up in the soil. The same steps must be followed to allow aeschynomene to voluntarily reestablish as when establishing the crop initially. Removal of hahiagrass canopy is important. and this can be accomplished by burning and/or grazing. Light disking can also be used effectively. but this must be done at the time when seeding is recommended to allow greater chance of adequate seedbed moisture.

Summary

Remember the three most important steps to improve establishment success: site selection; seeding date, and bahiagrass canopy control. Following all nine steps will help assure successful establishment of aeschynomene. Additional assistance and advice from county extension agents or the forage extension specialists at the IFAS Research Centers are available.