

# TECHNICAL

U. S. DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE

# NOTES

IOWA STATE OFFICE  
DES MOINES, IOWA

---

Agronomy #4

Date: June 8, 1978

Subject: MANAGING NATIVE GRASS STANDS FOR PRODUCTION

To achieve maximum seed production, grasses should be planted and maintained in rows 36" to 40" apart. This allows control of the plant population for high seed yields. Yields from broadcast or solid drilled stands may be ½ that of plantings in wide rows.

## Weed Control

If planted in rows, cultivate not deeper than 1½ inches to control weeds and maintain grass in rows. Do not throw soil on grass in row. Remove other perennial plants by hand to maintain purity and reduce problem of cleaning.

Chemical weed control for grass and broadleaf plants may be desirable. Use only chemicals cleared for this use. Do not spray with growth regulator chemicals when grass crop is in the boot stage or starting to head. Spraying at this time may interfere with proper filling of seed.

## Fertilization

Warm season native grasses should be fertilized about June 1<sup>st</sup>.

### 1. Nitrogen Rates

Big Bluestem	40-60 lbs/acre (excess may cause lodging)
Indiangrass	60-80 lbs/acre
Switchgrass	50-75 lbs/acre

### 2. Phosphorus

Add when soil tests indicate present phosphorus levels are low.

### 3. Potash

Add when levels are low.

## Residue Management

Forage may be grazed following seed harvest or cut for hay. The forage at this growth stage is low in protein and will require a protein supplement. Four or five inches of stubble should be left over winter to reduce damage to crowns.

If excess plant residue remains in spring, it should be removed by shredding and tilling into the soil or by burning in spring when new grass growth is about 1 inch long.

Burning will assist in controlling annual weeds and stimulate growth of warm season grasses.

## Harvesting

1. Maturity – Seed generally should be harvested in the hard dough stage to obtain highest germination and longevity in storage.

The first mature seed will develop at the top of the seed head and progress to the lower portion. Generally, when the tip of the seed head is beginning to shatter, the greater part of the seed is ready for harvest. Approximate dates of expected harvest are:

Switchgrass	September 5-10
Big bluestem	September 10-15
Indiangrass	September 15 – October 1

2. Method of Harvest – The direct combine method is the most desirable method. The native grasses grow 5 to 8 feet high and it is only necessary to cut the top 18 inches to 2 feet of plant to obtain all of the seed. The combine head may not operate when this high. Moisture content of the immature seed will require the seed to be dried as soon as it comes from the field to prevent damage due to heating.

Swathing of standing grass may be done when seed is mature and harvest will be delayed. Most grasses will hold seed 10-15 days before severe shattering takes place. The cutting height and volume of material makes this system more complicated on these tall grasses with light seed.

3. Care of Seed – Freshly harvested seed contains too much moisture for safe storage. As the seed comes from the field, it must be artificially dried or spread thin and stirred once or twice daily until it feels dry and brittle.

Artificial drying can be done by constructing a bin with a false floor of wire and burlap and a blower to circulate unheated air up through the seed. Seed may be up to 30 inches deep and will require two or three days of drying.

Seed may be spread 8-10 inches deep on a tarp stirring once or twice daily until dry.

4. Processing of Seed – Seed from the combine, after drying, can be cleaned with a fanning mill.

For switchgrass, seed can usually be cleaned adequately with a fanning mill unless seed of crop weeds of similar size are present.

For indiagrass and big bluestem, the long hair (awn) on the outer end of the seed and the wooly appendages at the base of the seed need to be removed for better handling of the seed.

A hammer mill with a screen size slightly larger than the cleaned seed and run at 600 to 1400 RPM will accomplish this. Mills with larger than 10 inch cylinder must be run at a more reduced speed.

Experiment by filling mill with seed and run at a slow speed. Examine seed and if seed is not damaged and still contains hairs, increase speed about 100 RPM. Repeat until material is being trimmed properly and seed breakage is minor. When desired results are obtained, process the entire lot of seed.

When seed has been processed through the hammer mill, it can be processed through the fanning mill again to remove most of the invert material. It must be remembered, a hammer mill is designed to grind and if improperly operated, the entire lot of seed could be damaged. The mill must be operated full of seed at all times. This allows rubbing of awns from the seed but with little seed damage.

A debearder is a machine which is used in the seed industry to remove awns and undesirable appendages with less chance of seed damage. This machine would only be practical for someone processing large quantities of seed for commercial sale. Seed processed in this manner is able to be seeded in a wider variety of equipment.

5. Seed Testing and Storage – As seed is going through the final cleaning stage, a small sample should be collected at several times while cleaning the entire lot of seed.

When finished, mix the small samples and draw a sample to submit for testing. Keep the remainder of the mixed samples for selection of a sample for retesting if needed.

Freshly harvested seed may not germinate well until it has been stored for several months. Most seed improved in germination when held in proper storage for a year or more.

Seed stored at about 30% relative humidity and 60 degrees Fahrenheit will remain viable for several years. High temperatures and high relative humidity will cause seed to lose viability quite rapidly.

6. Combine Settings – (From literature)

Switchgrass: Start to combine when tips begin to shatter. Set cylinder speed at 1500 RPM and cylinder-concave spacing at ¼ inch. Cut high. Close chaffer sieve and use screen with small openings. Use slight air.

Indiangrass: Cylinder speed 1000 RPM and concave spacing, 3/8 inch. Keep air cut down and chaffer sieve set fully open. (To save highest yields, it may be necessary to remove every other row of vanes in chaffer sieve.) Cut high to reduce volume of material threshed. Cover space above tailing auger so nothing is returned to cylinder for re-cleaning.

Big bluestem: Harvest when grain is in hard dough stage and seeds are brittle and dry. Set cylinder speed at 900 RPM and cylinder-concave spacing at ½ inch. Avoid overloading straw rack by cutting high, running at slow ground speed, and cutting only part of the swath. Reduce air; may be necessary to shut off all air. Cover space above tailing auger so nothing is returned to cylinder for re-cleaning.

## 6 (a) Combine setting used at Elsberry Plant Materials Center

Switchgrass

Allis Chalmers – Model 72  
Cylinder – 900-1000 RPM  
Concave Spacing – About ¼ inch  
3/16 inch round screen

John Deere – Model 4400  
Cylinder – 900-1000 RPM  
Concave – ¼ inch or less

Big Bluestem

Allis Chalmers – Model 72  
Cylinder – 900 RPM  
Concave – ¼ inch  
Screen – 5/32 x 3/4 slotted screen

John Deere – Model 4400  
Cylinder – 900-1000 RPM  
Concave – ¼ inch – 3/16 inch

Indiangrass

Allis Chalmers – Model 72  
Cylinder – 900 RPM  
Concave – ¼ inch  
Screen – 5/32 x 3/4 slotted screen

John Deere – Model 4400  
Cylinder – 900 RPM  
Concave – 3/16 inch

Use slight air on all species.

The above settings are listed as guides. As maturity of seed changes, the combine settings may need to be adjusted as maturity and field conditions change. Proper adjustments can only be made by checking straw and material coming out of the combine and adjusting as needed.

## 7. Seed Processing

Drying – All seed, as it comes from the field, requires drying as discussed previously.

Switchgrass – This seed may be cleaned with the fanning mill when properly dried.

Screens	<u>Top</u>	<u>Middle</u>	<u>Bottom</u>
1 <sup>st</sup> Cleaning	7	1/12	1/25
2 <sup>nd</sup> if necessary	1/12 (round)	1/13	1/25

Big Bluestem – Seed may be cleaned after drying. Seed should be processed through hammer mill as previously discussed or with debearder. Processing once through the fanning mill is adequate.

Screens	<u>Top</u>	<u>Middle</u>	<u>Bottom</u>
Roundscreen	12	11	1/18

Indiangrass – Seed may be cleaned after drying. Process through hammer mill or debearder as previously discussed. One cleaning in fanning mill should be adequate.

Screens	<u>Top</u>	<u>Middle</u>	<u>Bottom</u>
	13	11	1/18

Air setting should be set where proper cleaning is obtained. It may be necessary to partially cover air intake.

Prepared by: Richard Brown, Plant Materials Specialist  
Ernie Hintz, Conservation Agronomist

\s\ Mervin G. Danielson  
State Resource Conservationist