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## EC188 Grass Seed Production in Nebraska

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# GRASS SEED PRODUCTION IN NEBRASKA



Intermediate wheatgrass seeded on the contour in rows for grass seed production.

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Acknowledgment. Photographs by Soil Conservation Service.



# Grass Seed Production in Nebraska

LAIRD G. WOLFE AND HENRY H. WOLFE<sup>1</sup>

**D**URING THE PAST FEW YEARS many thousands of acres of Nebraska cropland have been planted to grass. More and more farmers are beginning or increasing grass plantings because of the need for using surplus crop acreage and because of the proved value of grass in conservation farming.

This trend toward a grassland agriculture has created a great demand for seed of desirable grasses—a demand that has exceeded the supply and will continue to do so unless more thought is given to farm production of grass seed.

Planting and care of grass for the express purpose of producing seed is a relatively new undertaking but not a difficult one. Grass seed is a cash crop adapted to both dry-land and irrigated farms. Production can be carried out with ordinary farm equipment, and care and harvesting fit in well with other farm operations. Grass planted for seed production is a crop that gives a high per-acre return and at the same time is of benefit to the land.

## SPECIES TO GROW

Practically all grasses that are recommended for use in Nebraska lend themselves to profitable seed production. Exceptions include buffalograss which takes special harvesting equipment because of its low-growing nature and blue grama which is a poor seed producer. The selection of a grass or grasses for seed production is influenced by certain factors such as soil, moisture, and fertility requirements, and yield and selling prices of seed. Selling prices of different grass seeds will vary but can be determined from current quotations of commercial seed houses. In general, highest per-acre returns are realized from certified strains and from the introduced grasses. Average yields are difficult to estimate because they are so greatly influenced by fertility, management, and particularly by moisture. Unusually dry spring months or hot blasting winds at flowering time may stop seed setting entirely. On the other hand, good management of stands in normal seasons in eastern Nebraska and under irrigation in the west may give as much as 400 pounds of seed to the acre of the wheatgrasses and smooth brome grass. These species are generally the highest seed yielders. Next best, with yields ranging up to 200 pounds per acre, are switchgrass and sand lovegrass. Poorest and most erratic in seed production are the bluestems, grama grass and Russian wildrye.

Table 1 lists important perennial grasses that are in demand and are most nearly suited to profitable seed production.

<sup>1</sup> Nursery Manager, Soil Conservation Service, and Assistant Extension Agronomist, Nebraska Agricultural Experiment Station, respectively.

## PLANTING

Because grass seeds are small and produce correspondingly small seedlings, care must be exercised in seedbed preparation and in planting. The seedling stage of grass is the most critical and it is in the first month after planting that most failures occur. Good stands of grass are realized when seeds germinate quickly and when seedlings grow vigorously right from the start. Pointers important to success in establishing stands of grass are as follows:

### Seed

Plant seed that is high in germination and purity. Plant seed that is adapted to Nebraska's climate and growing season. Seed from Nebraska-grown sources is safest to use.

### Seedbed

There are two types of seedbeds: (1) those prepared by plowing or discing, and (2) natural seedbeds such as small grain stubble or stalk fields. Both give good results. A proper seedbed should be well settled, mellow, moist, firm, and free of weeds. Firmness is particularly important and is acquired by packing with farm-type treaders or packers. Packing prior to seeding is recommended. A well-packed seedbed makes possible close contact between seed and soil particles and mois-



Wheatgrass planted in rows for seed production at Scottsbluff on irrigated land.  
Picture taken in June two months after seeding.



ture, thereby hastening germination. It permits roots of young seedlings to find ready anchorage, moisture, and nutrients. A well-packed seedbed does not dry out as rapidly as does a loose seedbed. Seeding can also be made at a more uniform depth if the soil is firm.

### **Date to Seed**

In Nebraska there are three general seeding dates—late summer, early spring and midspring. The choice of seeding date depends primarily on the type of grass to be planted and conditions existing at the time.

Cool-season grasses are like wheat and rye, and do best and make the most growth during cool weather; whereas warm-season grasses are more like corn and sorghum and require warm conditions to germinate and grow.

Cool-season grasses listed in Table 1 are best planted in late summer (August 15-September 20), provided moisture is present and grasshoppers are not a problem. Cool-season grasses may also be planted in early spring. Such plantings should be made as soon as the ground can be worked.

The advantages of late summer or early fall seeding over spring seeding are: (1) less competition from weeds; (2) better establishment of plants by the time heat and drouth become serious the following summer; (3) no loss of a crop, as fall-planted grass can usually be expected to furnish a crop of seed the year following planting.

Warm-season grasses do best when seeded in midspring at about corn planting time. This is true of all warm-season species with the exception of sand lovegrass which should be seeded in early spring. Midspring dates allow one or two light cultivations to kill weed crops before the grass is seeded. Cultivation is important because warm-season grasses generally produce seedlings that are smaller and more susceptible to weed competition than are those of cool-season species.

### **Depth to Seed**

Compared with small grain, grass seeds are small and contain less food reserves. In weight, one kernel of wheat is equal to six seeds of intermediate wheatgrass, to 10 seeds of smooth bromegrass and to 118 seeds of sand lovegrass. Because of this, the depth the seed is placed in the soil is important. If planted too deep, food reserves may be used up before the sprout reaches the surface. Planting depths should average  $\frac{3}{4}$  inch for large-seeded grasses (intermediate wheatgrass, tall wheatgrass, bromegrass, and crested wheatgrass) and  $\frac{1}{4}$  inch for smaller-seeded species. This is for average soil types. Plantings made in sandy or light-textured soils can be made at depths up to one-half greater than those recommended for hard or medium-textured soils.

TABLE 1.—Characteristics and harvesting information of adapted species.

Species	Origin	Habit of growth	* Season of growth	Average date of combine harvest	Cylinder speed of combine (rpm)	Combine cylinder-concave clearance (inches)	Purity of combined seed (per cent)	Remarks
Crested wheatgrass	Introduced	Bunch	Cool	Late July	1400	1/4	75	Stands drouth and cold; seed easy to harvest.
†Intermediate wheatgrass	Introduced	Sod	Cool	Early August	1500	3/8	75	Easily established on wide range of well drained soils; seed easy to harvest.
Tall wheatgrass	Introduced	Bunch	Cool	Late August	1500	3/8	75	Tolerates wet, alkali conditions; easy to harvest.
Western wheatgrass	Native	Sod	Cool	Mid-August	1500	3/8	60	Needs moisture—heavy soils; easy to harvest.
†Smooth brome	Introduced	Sod	Cool	Mid-July	1000	3/8	75	Needs moisture and fertility; easy to harvest.
Russian wildrye	Introduced	Bunch	Cool	Late June	1400	3/8	80	Stands drouth and cold; erratic seeder; seed shatters.
Reed canarygrass	Native	Sod	Cool	Late July	1500	1/4	80	Tolerates wet conditions; does not ripen evenly; seed shatters.
Big bluestem	Native	Sod	Warm	Mid-September	900	1/2	30	Needs moisture and fertility; chaffy seed difficult to harvest.
Sand bluestem	Native	Bunch	Warm	Mid-September	900	1/2	25	Needs moisture; does well in sand; chaffy seed; difficult to harvest.
†Side-oats grama	Native	Bunch	Warm	Mid-August	1000	3/8	25	Poor seeder; seed shatters; easy to harvest.
†Sand lovegrass	Native	Bunch	Warm	Early October	1500	1/8	80	Does well in sandy soil; easy to harvest.
Indian grass	Native	Sod	Warm	Late August	1000	3/8	40	Needs moisture and fertility; some harvesting problems.
†Switchgrass	Native	Sod	Warm	Late August	1500	1/4	75	Needs moisture and fertility; easy to harvest; some shattering.

\* Cool-season grasses start growth early in the spring, may go dormant in hot weather of July and August, and with moisture will green up again in fall. Warm-season grasses begin growth in middle or late spring and continue until frost.

† Nebraska certified.



### Planting Methods

In Nebraska, where moisture is the most common limiting factor, it is important that grass be drilled in rows and that rows be on the contour. Various types of planters, listers, and drills may be used successfully but an ordinary grain drill equipped with an agitator will give best results. Feed drops in the grain box can be plugged to get the desired spacing. For instance, a regulation 13 x 7 grain drill with stops at all but the middle and end drops will plant three rows 42 inches apart. Row spacing may vary and the width should be determined by the type of cultivating equipment on hand. Grass planted in rows for seed production is superior to solid plantings in many ways. Among the advantages are greater yields, yields hold up over a longer period of time, weeds are more easily controlled, and less seed is needed in planting.

### Rate to Seed

Seeding rates will depend on the purity and germination of seed and to a certain extent on geographical location. Less seed is needed per acre in a 15-inch rainfall area than in a 25-inch area or under irrigation. Row plantings require about one-half the amount of seed recommended for solid stands. Good stands in 36- to 40-inch spacings will result if a 5- to 6-pound per acre rate for brome or the wheat-grasses is used; 7 to 8 pounds for bluestems; 4 to 5 pounds for switch-grass, side-oats grama, and Indian grass; and 2 pounds for sand love-grass. These rates are intended as a guide only and are based on seed that has a germination of 90 per cent and is at least 70 per cent pure.



Cultivating intermediate wheatgrass planted in rows for seed production.





Applying commercial nitrogen fertilizer to intermediate wheatgrass planted in rows for seed production, 60 pounds of nitrogen per acre.

### Nurse Crop

With few exceptions nurse crops are not recommended. Nurse crops too often act as harmful competitors to new grass seedlings and should be used only when a cover crop is needed to hold the seedbed from blowing or washing. Although not considered a nurse crop, a few handfuls of oats in the grain box drilled along with spring-planted grass will serve as a row marker to make cultivation easier.

### CARE OF STAND

Proper management to realize maximum seed production involves only control of weeds, maintenance of rows, and renovation and fertilization as required. It is important that weeds be suppressed in the first growing season. Cultivation of new seedlings should begin as soon in the spring as rows can be determined from a tractor seat. Where cultivation is not practical, mowing at a height of 4 to 6 inches may be used as a first-season weed control. Chemical weed killers also are useful and are not harmful to grass if applied as recommended for small grain. In the second and later years after planting, a good stand of grass usually dominates annual weeds. Cultivation, however, has a dual purpose and is equally important in keeping grass in rows. One or two cultivations a season will trim the rows and destroy new plants volunteering between the rows. If sod species, and bunch grasses to a lesser extent, are allowed to fill in between the rows, seed yields drop and the same conditions soon exist as in old "sod-bound" brome grass fields. With all species the second harvest is usually the best. In suc-

ceeding harvests of sod-forming grasses (and again to a lesser extent with bunch grasses) seed yields become smaller each year. Here fertility is the answer. Profitable yield increases are obtained from application of barnyard manure or commercial nitrogen fertilizers. Manure may be disced in lightly in fall, winter, or early spring. Commercial fertilizers can be handled in the same manner or side-dressed early in the spring.

Stubble left after combining helps to catch snow and does not often present a problem. If stubble is rank and makes cultivation difficult it may be disced down without injury to the stand by shallow discing diagonally to the grass rows. Stubble should not be burned.

### HARVESTING AND HANDLING

Grass seed harvest is similar to and almost as simple as oats harvest. Time of harvesting depends upon the species grown and the method used. Binders, windrowers, and combines all work satisfactorily but combining is cheapest and is the method most commonly used. Combines having rubber-faced angle-bar or rasp-bar cylinders are best for grass seed harvest. The smaller combines with maximum adjustments give greater efficiency. Compared with harvest of small grain, combine settings for grass seed require about the same cylinder concave clearance and slightly reduced cylinder speed but little or no air is



Seed on first year's growth of intermediate wheatgrass on dry land at North Platte. Rows are spaced 40 inches apart and are planted on the contour.





Harvesting wheatgrass seed by combine. Lancaster County, Nebraska. August, 1949.

needed. In addition the forward speed cannot be as great as with small grain. Table 1 gives approximate settings that will serve as a guide in starting harvest. Depending on the species a period of 5 to 10 days usually exists during which combining can be done before shattering makes the harvest unprofitable. In most cases combined seed carries moisture and will heat if sacked or binned directly from the combine. Freshly harvested seed should be spread in a thin layer to hasten drying. After 48 to 72 hours of drying the seed is ready to be stored or shipped. Many commercial seed houses and wholesale seed dealers prefer to buy grass seed without more cleaning than it receives from the combine. If the seed is intended for local planting without first going through seed trade channels, some cleaning or processing is necessary. Once over a fanning mill will remove chaff from seed of the cool-season species shown in Table 1 and leave it in condition to flow readily in a drill. Seed of some of the warm-season grasses has hairs or awns and must be processed before it can be drilled. Processing can be done with farm hammer mills that are operated at slower than usual speeds. The action of the hammers breaks off the objectionable hairs and awns and, after fanning, the seed is in condition to drill.

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Further information on steps and points outlined herein may be obtained from your County Agricultural Agent or from your Soil Conservation Service Office.

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