

SOYBEAN PRODUCTION

IN NORTH DAKOTA

Farmers' intentions to plant for 1956, as reported by the Agricultural Marketing Service, March 19, indicate soybean production will increase sharply in North Dakota. The intended acreage of soybeans for 1956 was 108,000 acres, the largest in the history of the state, up 35 percent from 1955. This compares with 80,000 acres in 1955 and a 10-year average planted acreage (1945 to 1954) of 23,000.

Up to the past two or three years, soybean production in North Dakota was confined largely to the southeastern corner of the state. This area, corresponding to the commercial corn producing area in our state, had proved to be best suited to soybean production because of its favorable temperatures, longer growing season and generally satisfactory rainfall. In spite of some satisfactory yields of relatively late maturing soybean varieties, in recent years, in central and eastern areas of the state, the earlier maturing varieties will usually be more dependable in these areas.

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SOIL PREFERENCE

The soil requirements for soybeans are about the same as those for corn. A mellow, fertile, medium-textured loam soil will usually be best. Heavier soils should have good drainage. Sandy loam soils warm up faster and, when adequate rainfall is available, will hasten development of soybeans in a cool or short growing season.

A soil relatively free from weeds is very desirable to avoid serious weed competition. Effective weed control is important in obtaining profitable soybean production.

CHOOSING THE VARIETY

Choose a variety of soybeans which will mature under the average local growing conditions and produce a satisfactory yield of high-quality beans. In general, the farther north or west in North Dakota the earlier the variety must be.

Suggested soybean varieties, based on corn maturity zones (Fig. 1), are listed here for North Dakota. Your location within any one zone or your experience, should be considered in selecting from the several varieties suggested, as these often include quite a wide range in maturity. Table 1, listing Experiment Station yields and other agronomic data at Fargo and Casselton, along with the maturity classification listed, may be helpful in selecting the variety to grow.

VARIETIES SUGGESTED FOR CORN MATURITY ZONES

Suggested soybean varieties for each of the state's corn maturity zones are listed here. The varieties for each zone are

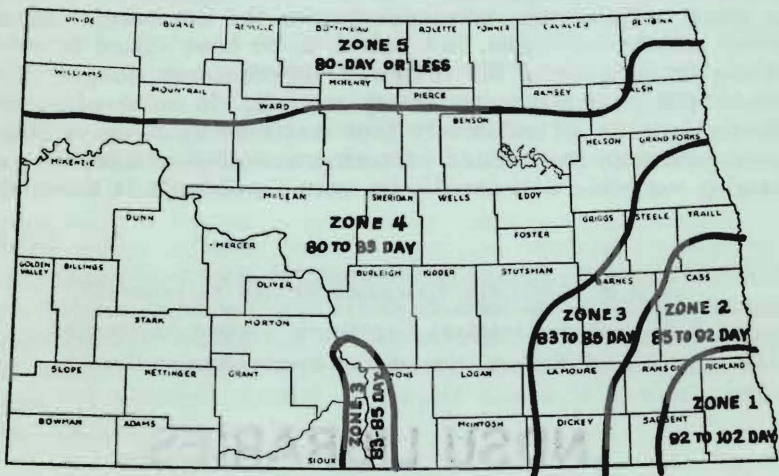


FIG. 1. - CORN MATURITY ZONES OF NORTH DAKOTA

given in order of maturity, the earliest at the top and the later maturing ones toward the bottom. The approximate maturity-day classification shown in parenthesis after each variety does not indicate the maturity of the soybean variety, but rather indicates about how each variety compares with corn maturity classifications for North Dakota.

Zone 1

Norchief (81 to 85 day)
 Norsoy (Pridesoy) (83 to 86 day)
 Ottawa Mandarin (83 to 87 day)
 Early Manchu (85 to 90 day)
 Capital (88 to 93 day)

Zone 2

Flambeau (80 to 82 day)
 Norchief (81 to 85 day)
 Norsoy (Pridesoy) (83 to 86 day)
 Ottawa Mandarin (83 to 87 day)
 Early Manchu (85 to 90 day)
 Capital (88 to 93 day)

Zone 3

Flambeau (80 to 82 day)
 Norchief (81 to 85 day)
 Norsoy (Pridesoy) (83 to 86 day)
 Ottawa Mandarin (83 to 87 day)

Zone 4

Flambeau (80 to 82 day)
 Norchief (81 to 85 day)

Zone 5

Acme (75 to 79 day)

Table 1. Summary of yields and other agronomic data of soybeans grown at Fargo and Casselton, North Dakota Experiment Station and U.S.D.A. Cooperating.

Variety	1955 Fargo	Yield - Bushels 1952 to 1955 ave.		Plant Height Inches	Lodging Index ¹	Relative Seed Size
		Fargo	Casselton			
Flambeau	23.9	27.0	25.2	29	2.7	Medium- large
Norchief	22.8	28.6	27.6	28	1.5	Medium- large
Ottawa Mandarin	24.0	24.0	29.2	28	1.1	Large
Capital	21.0	26.1	28.9	31	2.2	Small
Acme	12.2	-	-	22	1.0	Large
Norsoy (Pridesoy)	22.5	-	-	28	1.2	Medium - Small
Early Manchu	23.8	-	-	31	1.0	Medium- large

¹/Rates from 1 to 5. 1 - nearly all plants erect, 5 - almost all plants down.

Varieties Of Soybeans

ACME - is a very early variety, averaging about 10 days earlier than Ottawa Mandarin. It has a large yellow seed with a colorless hilum grows shorter than Ottawa Mandarin but stands up well. It is susceptible to shattering and should be harvested soon after maturity.

FLAMBEAU - About 5 days earlier than Ottawa Mandarin and slightly taller with a moderate tendency to lodge. It has medium-large yellow seed with a black hilum.

NORCHIEF - Two to 3 days earlier than Ottawa Mandarin and grows about the same height. It has a medium large yellow seed with a black hilum.

COMET - One to 2 days earlier than Ottawa Mandarin and grows taller. It has a medium-sized yellow seed with a colorless hilum. Comet is a new variety, as yet not adequately tested.

NORSOY (Pridesoy) - About 1 day earlier and of the same height compared with Ottawa Mandarin. It has a medium-small yellow seed with a colorless hilum.

OTTAWA MANDARIN - A medium to medium late maturing variety, comparing with about an 85-day corn. It grows medium tall, about 24 to 30 inches, and has large yellow seed with a colorless hilum. Ottawa Mandarin is used as a comparison of maturity with the other varieties listed.

EARLY MANCHU - About 2 days later in maturity than Ottawa Mandarin, grows taller and has a medium large yellow seed with a black hilum.

HARDOME - About one day later than Ottawa Mandarin and the tallest of these varieties. It has a moderate tendency to lodge. It has a medium-sized, yellow seed. Hardome is a new variety, as yet not adequately tested.

GRANT - About 2 days later than Ottawa Mandarin. Grows slightly taller. It has a medium-sized, yellow seed with a black hilum. Commercial seed of this new variety is not available this year.

CAPITAL - About 4 to 5 days later and taller than Ottawa Mandarin, has a moderate tendency to lodge and a small, yellow seed with a colorless hilum. Although classed at 4 to 5 days later than Ottawa Mandarin, it compares with about a 88 to 93 day corn.

INOCULATION

Unless soybeans have been grown on the field in recent years, the seed should be inoculated with "soybean bacteria" before planting. This provides the necessary bacteria in the soil which will allow the soybean plants to function as a legume, utilizing and storing nitrogen from the air.

SEEDBED PREPARATION

Soybeans respond to good seedbed preparation. On fall plowed fields shallow spring tillage to kill weeds before planting is effective. On soils where spring plowing is practiced, plowing is usually done just before planting time. A firm moist seedbed as free from weed seed as possible, is desired. The sooner the soybeans are planted after the last cultivation the better chance they have to compete with the weeds.

FERTILIZING

Soybeans have been rather erratic in their response to commercial fertilizer. If a soil test of the field or response in other crops indicate a distinctly low phosphate availability, a row application by planter attachment of about 80 to 125 pounds per acre of 8-32-0 or its equivalent is recommended. As fertilizer results have varied considerably, experience on your farm is your best guide. Leave an unfertilized check strip for comparison. Not over 10 pounds of nitrogen should be applied per acre in the row to prevent possible injury to the seed.

PLANTING

Soybeans are sensitive to low temperatures. They should not be planted until the soil has warmed up and air temperatures are favorable. This will usually be about corn planting time, or slightly later. This slightly delayed seeding allows time for destruction of early starting weeds before planting. On good land where weeds are not a serious problem, planting as early as favorable conditions permit allows the beans to take advantage of the entire growing season.

Planting in rows is the most common method used and permits the best weed control by cultivation. Weed control is important in obtaining good yields. A corn planter with the proper plates, a grain drill or a sugar beet planter may be used. Plant deep enough to place the seed in moist soil. This will usually be about 1-1/2 to 2 inches deep. Planting too deep, or in a soil which crusts, may result in poor emergence.

The most common row spacing is 40 or 42 inches, the same as for corn. This makes it possible to use regular corn planter and cultivator equipment. A number of soybean producers are using 36-inch row spacing. When planting and cultivating equipment will permit this spacing higher yields have resulted. Narrower row spacings than 36 inches, particularly for shorter, earlier maturing varieties, will generally provide higher acre yields but will require special planting and cultivation equipment.

Close drilled, or solid, seedings will produce satisfactory yields if the land is relatively free from weeds. Some weed control early in the season, with a harrow or rotary hoe can be obtained but if there are very many weeds in the field weed control is often unsatisfactory.

RATE OF SEEDING

In row plantings for best yields and competition with weeds, plant soybeans about 1 to 1-1/2 inches apart in the row. This will require about 45 to 60 pounds of seed per acre, depending on the row spacing and size of seed. There are about 3,000 medium-sized soybeans in 1 pound. For 20 to 24-inch row spacing about 90 to 100 pounds of seed per acre are required. About 120 pounds per acre should be seeded for solid seedings. In all cases adjust the seeding rate for size of seed and germination test.

CULTIVATION

Effective weed control is an important factor in obtaining high soybean yields. Cultivate early. A spike-tooth harrow or weeder can be used between planting and emergence of the beans.

When the beans are 3 to 8 inches tall, frequent cultivations with a light harrow, weeder, or rotary hoe, can be effective in killing weed seedlings in the rows with little damage to the beans, if done when the beans are slightly wilted during the warm part of the day.

Row plantings can be cultivated with ordinary corn or beet cultivators. Two or three cultivations are usually needed. Shallow cultivation with sweep-type cultivator shovels is recommended to prevent ridging which makes harvesting more difficult and to prevent serious injury from root pruning. Avoid cultivating soybeans when the foliage is wet to prevent the possibility of spreading diseases which may be present.

Soybeans are somewhat susceptible to injury from 2,4-D or MCP. Chemical control of broadleaved weeds in soybeans is, therefore, not generally recommended. However, if weeds such as common mustard or cockleburs cannot be satisfactorily controlled by cultivation, an application of 2 ounces per acre of the amine formulation of 2,4-D or MCP may be applied. For least injury to the soybeans, spray when the beans are 3 to 5 inches tall.

HARVESTING

Straight combining is the most satisfactory and commonly used method of harvest. It is important to follow the combine manufacturer's recommendations for necessary adjustments to prevent splitting and breaking the beans. Cylinder concaves or bars should be opened up as required and cylinder speed reduced by about one-half. If the beans are very dry it may be necessary to combine only in the morning or evening when humidity is high.

Harvest soybeans when the plants mature and the beans are dry, containing not more than 14 percent moisture. When very dry (8 to 10 percent moisture) more shattering and injury to the seed in harvesting will generally occur. Shattering of about 40 beans per square yard represents a loss of 1 bushel per acre.

STORING

Soybeans may be safely stored for short periods of time during the fall or winter with a moisture content as high as 14 percent. For safe storage during the spring or summer months soybeans should not contain more than 12 percent moisture. Beans which are free of foreign material and split beans will store better and stay in condition longer.