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1959

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Recommended Citation

Extension, Cooperative, "Growing Soybeans in South Dakota" (1959). *SDSU Extension Fact Sheets*. 176. https://openprairie.sdstate.edu/extension_fact/176

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Growing Soybeans in South Dakota

The acreage of soybeans in South Dakota has greatly increased over the past 10 years. Soybeans are one of the best cash income crops for the eastern counties of the state. Not too long ago soybeans were confined mostly to the southeastern counties. But the area of adaptation has expanded northward and westward. Contributing to this expansion are new improved and adapted varieties, more knowledge about growing the crop, and the fact that soybeans have been used on land taken out of corn.

Soybeans are not a particularly simple and easy crop to produce. On the other hand, most farms are equipped with the necessary machinery for raising them. Experience has shown that those who are attempting to grow soybeans for the first time should consider the problems and hazards involved before planting any extensive acreage.

This fact sheet is printed to assist all soybean growers to make a success of this enterprise.

What Areas Are Adapted to Soybeans?

Soybeans are best adapted to the eastern tiers of counties. Some beans are also being grown in the area immediately west of these counties. When soybeans are grown out of its area of adaptation it becomes a very high risk crop.

What Varieties Are Recommended for South Dakota?

Maturity is one of the most important factors in the selection of varieties. Since South Dakota lies in the northwestern corner of the soybean belt, early to medium-early maturing varieties should be selected.

Grant, Ottawa, and Capital are the earliest recommended varieties. They are adapted to the northern soybean area of the state. **Grant**, released in 1956, has proven to be a superior early variety. It has medium plant height, good lodging resistance and a high yield record.

Chippewa, released in 1955, is about three days later than the early varieties, and about five days earlier than **Blackhawk**. It stands very erect and is a high yielder. The variety is adapted in the eastern central counties and in the more favorable soybean areas in the northeastern counties.

Blackhawk is five to six days earlier than **Hawkeye**, stands well, bears pods not too close to the ground and has given uniformly high yields. **Blackhawk** is adapted primarily to the region bounded by Brookings and Kings-

bury counties on the north and Turner and Lincoln counties on the south. It can be grown in low altitude areas in the northeastern counties.

Lindarin is a new high yielding variety released in 1959. The plants are medium in height and grow erectly with spreading foliage. The variety has good resistance to lodging and to seed shattering. The seeds are usually of high quality and the oil content is high. **Lindarin** matures about four days earlier than **Hawkeye** and a few days later than **Blackhawk**. Area of adaptation is in the southeast counties. The northern boundary is the center of **Moody** and **Lake** counties.

Harosoy is a Canadian variety about three days earlier than **Hawkeye**. Under some conditions it may have a tendency to lodge. Its area of adaptation is in the eastern counties south of Highway 16.

Hawkeye is a medium late maturing variety recommended for the southeast counties of South Dakota. This variety stands erect, bears pods high enough for convenient combining and has given high yields.

Ford is a late variety for South Dakota and is recommended only for the very southeast area of the state. It is about four to five days later than **Hawkeye**. The plant height is tall and erect. It has good lodging resistance. **Ford** is a high yielder and produces high quality beans.

Where Can Good Quality Seed Be Secured?

It is very important to plant seed of good quality and of high germination. Certified seed of recommended varieties assures a grower that he is getting an adapted variety. Certified seed is available from reliable seed companies and from local seed producers. Avoid seed of southern origin because it may be too late maturing and not adapted to South Dakota.

How Do Soybeans Fit Into Crop Rotation?

Soybeans may occupy any place in a rotation system where corn or other crops are used.

How Should Seedbed Be Prepared?

Soybeans need a relatively firm and clean seedbed. This means early spring plowing followed by several cultivations with a harrow or rotary hoe. This should pack the soil, kill weeds and conserve moisture. With

a well-prepared seedbed, more uniform depth of planting is attained. This helps immediate germination.

Are Weeds A Problem?

Proper control of weeds is a must in successful soybean production. Best time to kill weeds is in the seedling stage before the beans are planted. Prepare the field early, let the weed seeds sprout, then make a final shallow tillage operation just before seeding. At the present time there are no weed control chemicals practical to use on soybeans. For information refer to Experiment Station Circular "Weed Control in Field Crops."

Is Seed Inoculation Necessary?

Experience and experimental results have shown that it is essential to inoculate the seed for successful results. The soybean is a legume and requires specific bacteria in order for nodules to form on the roots. The soybean, when properly inoculated, can get most of its nitrogen needs from the air. Commercial bacteria cultures are convenient to use and are efficient. Use according to directions on the container.

When Should Soybeans Be Planted?

The soybean is a warm weather crop and should not be planted in cold soil. Usually, beans are planted right after corn planting time. If planted later than June 10 they may not have time to mature unless an extra variety for the area is used.

How Should Soybeans Be Planted?

Row planting with a corn planter is the most popular planting method. Rows should be 36 to 40 inches apart. Narrower rows can be made with a grain drill, but remember that a greater plant population requires a greater amount of moisture. Then too, most cultivators are not readily adapted to narrower rows. The use of furrow-openers on corn planters, set to operate shallow, is highly recommended. Their use is most important where top soil is dry. This insures uniform planting of one to one and one-half inches in moist soil for quick emergence. Soybeans, like all row crops, are inductive to soil erosion. Plant on the contour if there is a slope of 2 to 6 per cent. Do not plant on land that slopes more than 6 per cent.

Should Soybeans Be Fertilized?

While soybeans do best on fertile soil, direct application of commercial fertilizers has not proven too effective. Fertilizers generally have given more profitable returns when applied to other crops in the rotation.

What Is The Best Rate Of Planting?

Plant seeds about one inch apart in the row. This is a better guide than pounds per acre. However, seeds one inch apart in 40-inch rows with a medium size seed variety would represent about one bushel per acre. Experience has shown that good stands aid in weed control and there is less danger of seedlings not emerging because of soil crusting.

How Should Soybeans Be Cultivated?

Proper and timely cultivation is essential. A few days delay of some operations may result in a weedy field.

Rapid coverage with a rotary hoe or harrow before plants emerge is often desirable if the beans are slow

coming up or if the soil has crusted. When the beans are up and the weed seedlings are still "in the white" or not more than $\frac{1}{4}$ inch high, use a rotary hoe or spike tooth harrow. The rotary hoe can be an effective and economical tillage implement in controlling weeds in soybeans; however, the operation must be "timely." Hoing when the ground has a slight crust gives the best weed control results. Repeat this tillage operation as often as necessary until beans are six to eight inches high. Do this type of tillage in the heat of the day, and, if the rotary hoe is used, at a fairly rapid speed. Don't be alarmed if 1 or 2 per cent of the soybean seedlings are destroyed.

When the beans are eight to ten inches high, follow with one to three shallow cultivations. Duckfoot-type shovels are usually preferred. If early weed seedlings are controlled, two cultivations are usually sufficient. Avoid excessive hilling of the rows which will interfere with combining. Stop cultivations when plants start to bloom.

What Are The "Enemies" Of Soybeans?

Grasshoppers and blister beetles can be very destructive to the soybean crop, but insecticides are available to keep them under control. Rabbits and pheasants do considerable damage—especially rabbits—if they are numerous. The danger is greater for small isolated fields.

How Are Soybeans Harvested?

"Direct combining" is the most common method of harvesting. Set the cutter bar as close to the ground as possible and do not start harvesting until the moisture content of the beans is 14 per cent or less. A special attachment reel has extended fingers. Some beans are harvested by windrowing and then using a pickup attachment on the combine.

Soybeans are easily cracked and seed with cracked or broken seed coats will not germinate normally. Therefore, reduce cylinder speed as much as possible. Adjust concaves so that beans are still threshed out but cracking minimized. Run other combine parts at normal speed.

What Can We Expect In Yields?

With good cultural practices and adapted varieties, yields from 15 to 25 bushels per acre can be expected. Areas adapted to soybeans and grown under favorable conditions have produced higher yields.

What Precautions Must Be Taken For Storage?

Farm storage can be a problem. Cracked and damaged beans do not keep well. Do not store large quantities if moisture content is over 13 per cent. Check the stored beans occasionally and if trouble is anticipated, move the beans, or, better still, run the beans over a fanning mill to remove the cracked beans and foreign material.

Do Soybeans Make Good Hay?

If cut when seeds are $\frac{1}{2}$ to $\frac{3}{4}$ developed and properly cured, soybeans make excellent hay of high feeding value. Soybeans can be planted with other forage crops such as sudan, sorghum, millet or corn for silage. This mixture increases the total yield and improves the feeding value of the forage. When soybeans are used for hay or mixed with other forage crops, a later and taller variety is recommended.