

Extension Bulletin E-1528

Soybeans

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Introduction

Soybeans are produced profitably throughout the southern half of Michigan. They have a slightly shorter growing season than corn but longer than dry beans. Soybeans, in rotation with corn, provide for productive growth of both crops while normally reducing potential pest problems.

Soil and Climatic Requirements

Soybeans may be produced on most of the soils where corn can be grown but, like corn, are most productive on deep, well-drained, fertile soils. When grown on wet, poorly-drained areas, they often encounter root rot diseases.

The crop can be grown as far north as the Upper Peninsula with new short-season varieties. While the leaf tissue tolerates cooler temperatures than corn, when frozen they will not regenerate like corn often does. Therefore, frost susceptible areas should be taken into account when selecting sites for production

Variety and Seed Selection

Varieties should be selected by the following criteria: 1) yield, 2) maturity, 3) lodging resistance and 4) pest resistance. Many new varieties are available in Michigan. Information on performance of most of these varieties can be found in MSU Extension Bulletin E-1206, "Michigan Soybean Performance Report." Clean, viable, certified seed is the best assurance of achieving a good stand. Information on varieties certified in Michigan can be obtained from the Michigan Crop Improvement Association, P. O. Box 21008, Lansing, MI 48909.

Land Preparation

Soybeans can be planted on land prepared similar to that for corn using methods ranging from conventional to conservation tillage. Soybeans, however, are sensitive to depth of planting, and seedbed preparation. Planting equipment should be handled in a manner which assures uniform depth placement and good seed-to-soil contact. Over-tilling can compact soils and result in lower yields.

Soil Testing and Fertilization Needs

Fertilize and lime according to soil test recommendations. On high fertility soils the crop does not normally show a significant response to added fertilizer. When applying fertilizer in small amounts, row application may be preferred. A starter fertilizer high in phosphate may be beneficial if planting early. Fertilizer should be applied beside and below the seed. The soybean is a legume and gets most of its nitrogen from the air via root nodules. If soybeans have not been grown within the last four years on a particular site, seed should be inoculated with rhizobia inoculant. Viable inoculant should be purchased from a reputable company and kept in a cool area prior to applying to the seed the day of planting. Manganese, a micronutrient, may be deficient in a soil and result in interveinal chlorosis on the leaves. A soil test will show whether or not manganese is needed.

Planting Practices

a) Planting date — The earlier the planting the higher the yield. A good rule of thumb is to plant soybeans immediately following corn. Soil temperatures need to be slightly warmer than for corn (about 50-55°F). Average early to normal planting dates would be May 5-10 in southern Michigan and May 10-15 in central Michigan. If soybeans are planted early in cool soils, cold vigor tested seed treated with a fungicide should be used.

b) Row width — Soybeans yield significantly better in narrow rows (20" or less) than in wide rows. However, narrow row beans should be grown only if adequate weed control can be achieved without cultivation.

c) Planting depth — Soybeans should never be planted deeper than 2". A depth of 1½" is optimal.

d) Planting Rate — Because varieties differ in seed size, recommended rates are based on seeds per row foot. The following table lists planting rates according to row widths:

Row Width (inches)	Seeds/Ft. of Row*	Approximate lbs./A**
7-10	2.8-4	70-100
14-15	5-5.5	65-85
18-20	6-7	60-80
28-30	7.5-9.0	55-65

*Based on 85% germination.

**The larger the seed the more lbs/A required.

Weed Control

Before you can control weeds, you must identify them and know something about their growth patterns. Cultural practices such as tillage and cultivation can be used to reduce weed populations. Rotary hoeing of early germinating seeds can effectively control some weeds. Herbicide use may be necessary if cultural practices are not sufficient to reduce weed problems. MSU Extension Bulletin E-434 "Weed Control Guide for Field Crops" gives an extensive list of chemicals for control of most weeds. Using chemicals should be done only after **Reading the Label on the Container**. Sprayers should be calibrated to deliver uniform amounts of herbicide. Each herbicide has a specific use, rate, suggested time and method of application. Tank mixes of two or more herbicides may be used to control several problem weeds. Atrazine applied to a previous corn crop can injure soybeans. Check Bulletin E-434 for information on testing for carryover.

Insect and Nematode Control

Insects and nematodes have not been a serious economic pest to soybeans. MSU Extension Bulletin E-499 "Protecting Soybeans and Dry Beans from Insects and Nematodes" can be consulted if problems are encountered.

Disease Control

Several seedling, root rot and foliar diseases of soybeans are prevalent in Michigan and have resulted in economic loss. Many diseases can be partially controlled by crop rotation and other cultural practices. Because of potential disease problems, it is strongly recommended that soybeans not be grown for more than two years in succession on a field. Seed germination and seedling diseases can often be controlled by seed-applied fungicides and/or by planting into warm, well-drained soils. Phytophthora root rot can be a ser-

ious disease on heavy, poorly-drained fields. Several new varieties are available with resistance to most of the races of this disease. Most foliar diseases have not seriously limited yields and presently no pesticides are recommended for control. Details and pictures of common soybean diseases are shown in extension publication NCR57 "Soybean Diseases" and extension publications E-1418 and E-1419 "Soybean Diseases I and II."

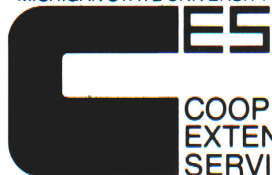
Harvesting and Storage

Harvesting can begin when the beans are less than 18% moisture, however, ideal moisture, is 14%. Remember to check for harvest losses and adjust the combine appropriately and often. When four beans are found on one square foot of soil surface, it means one bushel loss per acre. Paraquat can be used to kill weeds and speed dry-down of soybeans, thus reducing harvest losses. The crop can be stored at 14% moisture for a short time. For longer periods, moisture content should be 13% or less.

Additional References

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4. Nyvall, R. F. et al. 1978. Soybean Diseases. Ia. State Univ. Coop. Ext. Serv. Bull. Pm-528 Rev. (NCR-57).
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7. Soybeans: Improvements, production and uses. 1973. ed. B. E. Caldwell. Monograph No. 16. Amer. Soc. Agron., Madison, WI.

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