

<http://fieldcrops.cals.cornell.edu/soybeans/>

Cornell University – Soybean Info

## Soybeans

Acreage of soybeans in New York continues to increase, not just in the traditional district at the head of the Finger Lakes, but throughout the state.

Although soybeans are not difficult to grow, buyers are discriminating about seed quality, so producers must learn to harvest and handle the crop with skill and care.

Tests to date indicate that soybeans grown in New York are somewhat higher in protein content (34 percent to 37 percent) and lower in oil content (16 percent to 18.5 percent) than soybeans grown in the Corn Belt.

## Soybean Varieties

<http://fieldcrops.cals.cornell.edu/soybeans/soybean-varieties>

Varieties of soybeans differ in maturity as much as corn varieties do, but they are classified by a different maturity system. The varieties that require the least heat to mature are placed in Group oo. In progressively warmer parts of our state, the appropriate maturities are Group o, Group I, and Group II. Group II varieties mature dependably only in the warmer parts of upstate New York.

In the warmer regions of central and western New York, we recommend planting 60 percent to late (Group II) and 40 percent to medium (Group I) varieties with a May planting date. If planting occurs during the first 10 days of June, we recommend planting mostly Group I varieties. If planting is delayed to beyond June 10, we recommend planting Group o varieties in central and western New York.

In areas of northern New York next to the lakes, we recommend planting 30 percent of the acreage to Group II varieties and 70 percent to Group I varieties with a May planting date. Away from the lakes in northern New York, we recommend planting 70 percent of the acreage to Group I and 30 percent to Group o varieties. Do not plant Group II varieties close to the lakes or Group I varieties away from

the lakes in northern New York after May 25-30. The varieties recommended in the tables in this section have been good performers at two of our test sites in central/western or northern New York.

# Planting Soybeans

<http://fieldcrops.cals.cornell.edu/soybeans/planting-soybeans>

## Soybean Seeding Rates - Bill Cox, Cornell University, Educational Webcast, Plant Management Network



This presentation will help consultants, growers, and other practitioners in the Northeast USA region recommend or select seeding rates for soybean production. We will present studies (small plot and field-scale) that show **optimum yields averaged about 200,000 seeds/acre for soybeans in rows of 7.5 inches (drilled), 15 and 30-inches (row crop planter) in the 1990s but now average about 170,000 seeds/acre for untreated and about 140,000 seeds/acre for treated (seed-applied insecticide/fungicide) seed.** We did find subtle location by seed treatment by seeding rate interactions so we urge all farmers to conduct their own on-farm tests to fine-tune their seeding rates for each field on their farm.

**Note:** This video is best viewed at 1024 x 768 resolution. Best audio is achieved with a sound card and audio speakers/earphones. Download [Adobe Flash Player](#) if presentation is not viewable.

# IPM Practices for Soybeans

<http://fieldcrops.cals.cornell.edu/soybeans/ipm-practices-soybeans>

Relatively few insects and diseases have been reported to cause significant problems on soybeans in New York. While our experience with soybean pests is limited, field observations combined with pest reports from adjacent states and Ontario, Canada, have been encouraging. In addition to having few economically important pests, incorporating soybeans into New York field crop rotations provides an additional benefit by helping to break up the life cycles of many common corn and alfalfa insects and diseases.

Key soybean pest management considerations:

- Use sound soybean production agronomic practices. Choose a well-adapted, disease-resistant variety from an appropriate maturity group. Plant soybeans in a timely manner on a suitable site with proper field and seedbed preparation, fertility, and soil pH. Use of clean, certified seed is highly recommended. If bin-run seed is used, have seed checked for germination, seed-borne diseases, and presence of weed seed.
- An effective weed management program will minimize early-season competition and help protect potential yields. Conduct spring and fall weed surveys to identify and assess troublesome weeds and improve information to tailor and time weed management programs. Standard pre- and post emergence herbicide control programs are quite effective for minimizing weed competition. Another weed control option for soybeans planted in 30-inch row spacing is banding of herbicides in a 10-inch band over the top of soybean rows at planting and use of timely cultivation(s) to minimize weed pressure. This option has shown much promise. Banding of herbicides reduces herbicide use on 30-inch row spacing by about 66 percent.
- Seedcorn maggot is occasionally a problem under cool conditions in fields with high organic matter content, such as manured fields. Insecticide seed treatments, combined with high plant populations and the remarkable ability of soybeans to compensate for some stand reduction, will generally minimize stand losses from this pest. Mexican bean beetles and Japanese beetles are often conspicuous visitors to soybean fields in mid- to late summer. Adult beetles feed on soybean leaves, causing a skeletonized and brown appearance. While this damage may be very visible, damage is rarely economic. Bean leaf beetle, another foliage feeder causing concerns in adjacent states, has been observed in NY, but, to date, has not been found at economic levels. Indeterminate soybean types can tolerate up to 35 percent defoliation until bloom, about 20 percent while pods are small

and soft, and about 35 percent when pods are hardening. Treatment for pest damage below the percentages listed is not recommended.

See the tables below for suggestions on IPM activities and common pests by crop growth stage and seasonal occurrence.

## Diseases of Soybeans

<http://fieldcrops.cals.cornell.edu/soybeans/ipm-practices-soybeans>

Several diseases, including Septoria brown spot, downy mildew, and White Mold, are known to affect soybeans in New York. Little is known, however, about the incidence, severity, or yield effects of diseases in the state. Diseases generally are kept in check by the use of sound agronomic practices such as crop rotation and the selection of soybean varieties with resistance to diseases known to be a problem in the local area.

### **DISEASE MANAGEMENT**

#### **SEED TREATMENT**

A decision to apply a seed treatment fungicide should be based largely on the results of a seed germination test and examination of the seed for diseases and defects. This is especially important for bin-run seed. Treatment of seed with protectant fungicides is recommended for soybean seed with warm germinability of less than 85 percent but more than 75 percent. If warm germinability is less than 75 percent, the seed may have undergone irreparable physiological damage. Either seed of very poor quality should not be planted, or a sample can be treated with fungicide and germinability tests rerun to determine the efficacy of seed treatment. Due to the compensation ability of the crop, adequate stands are usually established from seed of 85 percent germination without the use of fungicides. Even good quality seed, however, can benefit from fungicide treatment when planted into cold wet soils or where there is a field history of damping-off or Phytophthora root rot.

Several fungicide products are labeled for seed treatment of soybeans, but only materials with broad-spectrum disease control activity are listed in the table below. Insecticide-fungicide combination products are also listed primarily for control of seed corn maggot and wireworm. These provide supplemental control of diseases on seed previously treated with fungicide.

Seed treatment can be done by the seed supplier or a planter box application can be made by the grower at the time of seeding. Remember to read and follow pesticide labels carefully.

### **FOLIAR AND SOIL FUNGICIDES**

Several fungicide products are registered for use on soybeans by foliar or soil application. These products are listed in the below table as a convenience for New York soybean producers. While each of the diseases listed occurs in the state, the data on the relationships between disease severity, yield loss, and economic return are not sufficient to base a recommendation for fungicide application to soybeans in New York. Good data from other parts of the United States, however, indicate that foliar fungicide application to a soybean seed crop (where environmental conditions and local disease pressure warrant it) can substantially increase seed vigor and germinability and can reduce the carryover of inoculum of seedborne diseases such as pod and stem blight and anthracnose. Soil applications of metalaxyl can be useful for specific field situations with wet soils or a history of Phytophthora root and stem rot.

## **Insects of Soybeans**

<http://fieldcrops.cals.cornell.edu/soybeans/insects>

Relatively few insects have been reported to cause significant problems on soybeans in New York. Soybean stands can be reduced by seed corn maggot and yields can be reduced by infestations of soybean aphid and two-spotted spider mites.



**Seed Corn Maggot**



**Soybean Aphid**



5356811 **Two-Spotted Spider Mite**

## Weed Control in Soybeans

<http://fieldcrops.cals.cornell.edu/soybeans/weed-control-soybeans>

Commercialization of glyphosate-resistant (Roundup Ready) soybeans introduced a new era in soybean weed control. With the possible exception of yellow nutsedge, this technology made postemergence broad-spectrum weed control with a single non-residual herbicide a reality.

In most situations it is recommended that glyphosate (Roundup PowerMax, Durango DMA, Touchdown Total, etc.) be applied to conventionally planted, glyphosate-resistant (Roundup Ready) soybeans 24 to 30 days after planting. While this works in most situations, less than desirable common lambsquarters control has been reported in some instances. Normal application rates of glyphosate in the field or greenhouse have controlled lambsquarters that is no more than 3 inches tall. Lambsquarters that is greater than 3 inches tall may require increased rates of glyphosate or a

tank mix of Harmony GT XP or Unity with glyphosate. Table 6.7.2 provides suggestions on how to improve lambsquarters control with either a two pass or one pass program.

If significant weed cover is present at planting, a burndown herbicide should be used before or at planting no-tillage, glyphosate-resistant soybeans. A second application of glyphosate should be made 24 to 30 days after planting. Where a single glyphosate application is made for burndown and for postemergence weed control in no-tillage soybeans, research suggests this application should be made 15 to 24 days after planting. Research indicates that residual herbicides are not needed in most situations.

Because soybeans are sensitive to \*atrazine and Princep residues, care should be taken the year before planting soybeans to ensure that herbicide carryover will not affect their establishment.

## **HERBICIDE RESISTANCE MANAGEMENT**

Herbicide resistance management involves the use of crop rotation and cultivation along with herbicide rotation and/or use of herbicide combinations that include herbicides with different sites of action (how they affect weeds). These practices will help manage existing herbicide resistant weed populations and delay development of new resistant weed populations.

To effectively utilize herbicides with different sites of action, everyone involved in decisions about weed management must have the site of action classification readily available. The Weed Science Society of America (WSSA) has approved a numbering system to classify herbicides by their site of action (Mallory-Smith, C.A. and Retzinger, E.J. 2003. Revised classification of herbicides by site of action for weed resistance management strategies. *Weed Technol.* 17:605-619). A group number is given to all herbicides with the same site of action. These **“GROUP NUMBERS”** are included in the **“Chemical weed control tables”** in each crop section. Since herbicide resistance management is most effective when practiced across all crops in rotation, a list of all herbicides in this guide with their **“GROUP NUMBERS”** can be found in **Table 8.2.1**. Mode of action/site of action and chemical families for site of action GROUPS can be found in **Table 8.2.2**.