

Selecting the Right Varieties

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Steps For Good Variety Selection

Maximum yield potential can better be achieved if farmers choose top-yielding varieties that match the soil, pest, and managerial (e.g., plant date) conditions imposed. Selection is complicated by the large number of varieties commercially available (100+), hence the following steps should be referenced when selecting varieties:

1. Select varieties appropriate for the time of planting (MG V to VI for May 1 through June 10; late MG VI through MG VIII for June 11 through July 1);
2. Choose varieties (<http://www.clemson.edu/agronomy/VT/Soybean/bean.htm>) that are high yielding over multiple years (environments);
3. Select nematode-resistant varieties for fields where parasitic nematodes (soybean cyst, southern and peanut root-knot, Columbia lance, or reniform) have been identified as a problem;
4. Consider varieties with good tolerance to diseases, lodging, and shattering;
5. Herbicide tolerance should only be used to select a variety after first knowing its yield potential and nematode resistance.

Performance Testing

New varieties and promising breeding lines are annually evaluated in official Clemson University tests. Test locations are at the Pee Dee REC at Florence, Edisto REC at Blackville, and Simpson and Calhoun Research Areas at Clemson. Yield, plant height, harvest maturity, and lodging are measured for each variety. Researchers may also evaluate nematode or disease resistance at certain locations. Performance results are available both on the Internet and at county Extension offices. Farmers are encouraged to check the performance data when selecting varieties.

Maturity of Varieties

Soybeans flower in response to day length, and are thus described as photoperiodic. Varieties grown in the United States are divided into 13 maturity groups, with MG 000 being the earliest and adapted to southern Canada, to MG X, adapted to southern Texas. The earlier varieties bloom when days are long and nights are short, while the later-maturing varieties bloom under long nights and short days. Most varieties that are MG IV or earlier are indeterminate. That is, the terminal growth bud on the main stem continues to grow after first bloom. Consequently, most of the pods on indeterminates are on the main stem.

For MGs, V, VI, VII, and VIII, adapted to the southern United States, the growth habit is determinate. The number of nodes and plant height of the mainstem are terminated at the full-bloom stage of growth. For determinates, branch growth continues after first bloom, and the

number of pods on branches is usually greater under good environmental conditions than for the main stem. The following are approximate harvest maturities from these groups when planted full-season (May 1 to June 10) in South Carolina.

- Group V: October 1 to 15
- Group VI: October 10 to 25
- Group VII: October 25 to November 5
- Group VIII: October 25 to November 15

Harvest maturity is an important consideration for farmers who wish to:

- Plant small grain for grazing early in the fall after soybean harvest;
- Harvest soybeans from Carolina bays or river bottoms before late fall rains saturate soils and make harvest difficult and untimely; and
- Avoid early frost damage to the crop, especially in the Piedmont region.

Spread Maturities to Reduce Risk of Drought Damage

Since there is a range of harvest maturities of about 45 days for MGs V through VIII, there is also a range of time for the bloom through pod-fill stages. Because adequate soil moisture from bloom through podfill is important for good yields, farmers should consider planting varieties from more than one maturity group to reduce the risks of drought damage during podfill. For example, in 2001, a drought in South Carolina in August and September reduced yields of many late planted MG VII and VIII varieties. Farmers with earlier planted MG V and VI varieties were able to avoid most of the effects of that drought. This practice also spreads out harvest and thus helps avoid harvest delays, which can reduce both yield and quality of the crop.

Lodging

Lodging, plants falling over, can occur at any time after first bloom, and is usually more of a problem with broadcast or drilled plantings. Early lodging can reduce yields by interfering with podset and podfill, or by encouraging more pod and stem disease problems. Late lodging, such as after a storm with heavy winds, can reduce yields and seed quality because of harvest difficulties and/or improper drying down of the crop.

Tall, late-maturing varieties; soybean planted at higher than optimum seeding rates; or soybeans planted in highly fertile bottomland have a higher risk of losses due to lodging. Farmers who anticipate a problem with lodging should select varieties with strong upright stalks or mainstems (usually the shorter varieties in Groups V and VI). Additionally, using the proper seeding rate for the row spacing will assist in reducing losses from lodging (see the Planting Considerations section). If excellent growing conditions are expected, seeding rates can further be reduced to ensure crop standability.

Seed Shattering

When harvest is delayed due to bad weather, or when some varieties dry down to seed moisture levels below 10 or 11 percent, seed shattering may occur in the field or at the cutterbar at harvest. To reduce the potential for shattering losses, harvest should begin at seed moisture

levels of 12 to 14 percent. If storage bins have the capacity for drying with air blowers, harvesting at 16 percent is not out of the question. In fact, for most years in South Carolina those farmers who wait for ideal moisture around 12 percent often have difficulty in harvesting their entire crop without losses in yield and quality, either from shattering, lodging, or disease.

Roundup Ready Varieties

Roundup Ready (RR) varieties have been widely adopted, especially in fields with hard-to-control broadleaf weeds such as sicklepod or Palmer amaranth or in fields having herbicide-resistant weeds (e.g. ALS-resistant pigweed and DNA-resistant goosegrass and pigweed). Since the release of RR varieties in 1996, farmer usage of this technology has increased annually, with 83% of the US soybean acreage planted to RR soybean in 2003. Since RR soybean is prevalent, the following are suggestions for obtaining maximum cost effectiveness when using these varieties:

1. Choose RR varieties that are adapted to SC conditions and fit your farming operation. If you are double cropping with wheat, RR varieties from late MG VI through MG VII are needed for best yield performance. Unfortunately, there are only a limited number of varieties available within these maturity groups. In addition, most of the RR varieties lack resistance to many of the nematodes common to SC. It is imperative that fields having a history of nematode problems not be planted to a RR variety that lacks resistance to the nematodes present in the field. If nematode infested fields are planted to nematode susceptible varieties and Roundup is used as the sole means of weed control, not only will yields be extremely suppressed from the nematodes, but weed problems will be exacerbated in field areas where soybeans are severely stunted or die as a result of the nematodes. If a RR variety with nematode resistance is not available, stick with conventional varieties that do possess resistance.
2. Select RR varieties that have good yield potential. Weeds are manageable using conventional herbicides; therefore, don't select a low yielding RR variety for the sole reason of controlling weeds.
3. Consider using a soil-applied herbicide if you are using RR technology and planting in wide rows (see Soybean Weed Control section).