



SOYBEAN FACTS

February 2010

Soybean Variety Selection - the First Step to Producing High Yields

Mike Staton, MSU Extension CURE Soybean Educator

Kurt Thelen, Professor of Crop and Soil Science, Michigan State University

Selecting soybean varieties is one of the most important management decisions producers make. The varieties you select will directly affect your yield potential and profits. Consider the following factors when selecting the best adapted varieties for your farm - yield, pest resistance or tolerance, standability, maturity and special considerations.

Yield is probably the most important characteristic to look for in varieties. Refer to tables 1 and 2 to see how critical variety selection is to your profitability. Yield potential under ideal growing conditions varies among varieties. The maximum yield potential of a given variety is also affected by weather and other environmental conditions. A variety that has the highest yield potential under ideal conditions may not yield as well as others when confronted with yield-limiting factors. The best way to account for this variability is to look at yield data from as many different environments as possible. Research has shown that evaluating variety performance over a wide range of locations and over multiple years will help you select the best adapted varieties for your farm. Since varieties have a relatively short life span, multiple-location data is easier to obtain than multiple-year data. The Michigan Soybean Performance Report is an excellent source for this information. The 2008 Soybean 2010 grower survey, indicates that top producers rank the Michigan Soybean Performance Report second to only their own on-farm trials when selecting varieties.

Pest resistance is another important characteristic as it protects a variety's yield potential when attacked by diseases or nematodes. Phytophthora root and stem rot is a common soil-borne pathogen in Michigan. Consider selecting varieties that have specific race resistance or a high level of tolerance to phytophthora when planting in fields with marginal drainage. Seed suppliers are the best source of information on the level of tolerance that varieties exhibit to Phytophthora.

Variety selection can also reduce yield losses from Sclerotinia stem rot or white mold. Although no varieties have been identified that have complete resistance to the disease, there are varieties that have lower infection rates and produce higher yields than others under the same level of disease pressure. The Michigan Soybean Performance Report is an excellent resource for comparing the white mold tolerance of soybean varieties.

Sudden Death Syndrome (SDS) is increasing in the Michigan and variety selection is your first line of defense. The best place to obtain SDS tolerance information is from your seed supplier. Be sure to find out if the SDS tolerance rating was determined from inoculated nursery plots and not grower observations.

Soybean cyst nematodes (SCN) are the most damaging soybean pest. Once a field is infested with SCN, planting SCN resistant varieties will protect yield and significantly reduce SCN populations. Ask your seed supplier to tell you the source of the SCN resistance. Rotating resistance sources will help prevent the nematodes from overcoming SCN resistant varieties.

Standability is important as lodged fields will delay harvest progress and increase harvest losses. Standability varies among varieties and environments. Variety selection is your best tool to prevent lodging, however cultural practices such as decreasing seeding rates and planting early have been shown to help. The Michigan Soybean Performance Report is the best resource for comparing the standability of soybean varieties.

Soybean producers should also consider maturity when selecting soybean varieties. Consider planting a range of maturities to spread out the harvest season. Identify the range of maturity groups that are adapted to your area.



Program paid for by Michigan soybean producers through the soybean checkoff.
www.michigansoybean.org



Selecting varieties that are too early for your area will lead to lower yields as the beans will be filling seeds under hotter and drier conditions. Selecting varieties that are too late for your area increases the likelihood of frost damage. The latest variety planted should reach physiological maturity (predominantly yellow pods) just prior to the date when there is a 20% chance of a killing frost occurring in the fall. Earlier varieties may be the best choice in the following situations:

- Earlier varieties are justified in fields where wheat will be planted. Early planting is essential to producing high yielding wheat. The first week of October is considered the optimum time to plant wheat in much of Michigan.
- Earlier varieties will stand better in fields where lodging has been a problem with full-season varieties.
- If planting becomes significantly delayed, select varieties that are 1/2 maturity group earlier than adapted full-season varieties.

Growers planning to produce specialty-trait soybeans under contract should work closely with their buyers when selecting varieties. Make sure to obtain a list of varieties that are acceptable to the buyer and select the best performing varieties from the list.

Selecting the best adapted soybean varieties for your farm is one of the most profitable decisions you will make. The Michigan Soybean Performance Report is an excellent resource for comparing the yields, standability, maturity and white mold tolerance of soybean varieties across multiple locations and years. The report is updated annually and is usually available by early November from local MSU Extension offices or on-line at: <http://www.css.msu.edu/varietytrials>.

A new searchable database for the Michigan Soybean Performance Report is available online at: <http://www.soybeanyielddata.msu.edu/>. The searchable database enables soybean producers to input specific search criteria such as soybean cyst nematode resistance, phytophthora resistance, protein and oil content and maturity to identify the highest-yielding varieties having the selected characteristics.

Your seed suppliers are the best sources for more detailed information about their top-yielding varieties such as seedling vigor, seed quality, seed size, sources of SCN resistance and disease tolerance to SDS and phytophthora root and stem rot.

Table 1. Yield advantage of the highest-yielding varieties over the average yield of all varieties and the lowest-yielding varieties when averaged across all locations and maturity groups from the Michigan Soybean Performance Reports (Roundup Ready varieties).

Year	High Minus Average (bu/acre)	High Minus Low (bu/acre)
2007	5.8	14.1
2008	5.0	10.7
2009	5.0	12.1
2010	4.2	8.1

Table 2. Economic advantage of the highest-yielding varieties over the average yield of all varieties and the lowest-yielding varieties when averaged across all locations and maturity groups from the Michigan Soybean Performance Reports (Roundup Ready varieties).

Year	High Minus Average (\$/acre)	High Minus Low (\$/acre)
2007	\$58.58	\$142.41
2008	\$49.85	\$106.68
2009	\$47.95	\$116.04
2010	\$48.09	\$92.75

Economic advantage was determined by multiplying the yield advantage of the highest-yielding varieties from table 1 by the USDA average prices received for each marketing year - \$10.10/bu in 2007, \$9.97/bu in 2008, \$9.59/bu for 2009 (estimated) and \$11.45/bu for 2010 (projected).

This fact sheet was originally produced by the Soybean 2010 project and will be updated as needed by its successor, the Soybean Management and Research Technology (SMaRT) program. The SMaRT program was developed to help Michigan growers increase soybean yields and farm profitability. Funding for SMaRT is provided by MSU Extension and the Michigan Soybean Promotion Committee. Additional information about increasing soybean yields and profitability can be found online at: <http://www.michigansoybean.org>

References: "Michigan Soybean Performance Reports", D. Wang and J. Boyse, 2007-2010, "Consider Pests and Diseases When Choosing Soybean Varieties", D. Wright, Plant Health Initiative, October 2003, "Soybean Variety Selection", Z. Hessel and H. Minor, "Using Soybean Yield Data to Improve Variety Selection- Part I", R. Klein, R. Elmore and L. Nelson, NebGuide, G1546.