



Herculex® XTRA insect protection technology by Dow AgroSciences and Pioneer Hi-Bred.® Herculex and the HX logo are registered trademarks of Dow AgroSciences LLC.



LIBERTY, LibertyLink and the Water Droplet logo are trademarks of Bayer.



YieldGard and Roundup Ready are registered trademarks used under license from Monsanto Company.



MARKET CHOICES: Grain harvested from products that bear this mark is fully approved for food and feed use in the United States and Japan, but is not approved in the European Union. You must find a market for this crop that will not ship this grain or its processed products to Europe. Appropriate markets for this grain include: domestic feed use or grain handlers that specifically agree to accept this grain and handle it appropriately. For more information on your grain market options, go to the American Seed Trade Association's website at www.amseed.org or call your seed supplier. MARKET CHOICES is a certification mark used under license from ASTA. Know Before You Grow™, an information service provided by National Corn Growers Association at www.ncga.com.



To protect the usefulness and availability of these technologies for the future, growers must implement an Insect Resistance Management (IRM) program as specified in product use guides for the following traits available in Pioneer corn hybrids: Herculex® I, Herculex RW, Herculex XTRA and YieldGard® Corn Borer.

For detailed IRM requirements for hybrids with in-plant insect resistance, refer to the appropriate product use guide, available from your Pioneer sales professional or on the web at: www.pioneer.com/IRM.



® TM SM Trademarks and service marks of Pioneer Hi-Bred. All purchases are subject to the terms of labeling and purchase documents. © 2007 PHIL CORN006933P146R1

Crops

Buckeye scientists study flood endurance of beans

By CANDACE POLLOCK

LITTLE can be done to prevent soybean injury due to flooding, but the future is bright for farmers to grow varieties tolerant to the effects of standing water.

Ohio State University researchers, collaborating with the University of Missouri-Delta Center, are studying the effects of flooding on soybean lines in the hopes of identifying tolerance genes that can be bred into existing susceptible varieties. After one year of research, results look promising.

"Things so far look good," says Tara VanToai, an Ohio State University plant scientist with the USDA Agricultural Research Service. "We can tell just by looking at the soybean lines which ones are exhibiting flood tolerance."

Tolerant varieties

VanToai and her colleagues are analyzing 220 soybean lines that carry the genes of a tolerant Asian variety and a flood-prone variety. The lines, grown in Missouri and at the Ohio Agricultural Research and Development Center in Wooster are being evaluated for:

- yield
- plant height
- leaf greenness
- level of survival after flooding

"We flood the fields until the plants start to show symptoms. Then we quantify the tolerance of each line under those field conditions," says VanToai. "Our hope is that when we compare the data between Wooster and Missouri, we find lines grown in both locations that are flood tolerant."

The research, partly funded by USDA-ARS, stemmed from earlier work conducted by VanToai that found carbon dioxide buildup in flooded fields is a major cause of injury and death to soybean plants.

"It was previously suspected that lack of oxygen was the main problem with damaged or dying soybeans associated with flooding. But what we



Key Points

- Researchers are exploring flood-tolerant soybeans.
- Finding varieties that are resistant to carbon dioxide is the key.
- Plants also need to be able to withstand diseases that show up in flooded fields.

found was that, although lack of oxygen played a small part, carbon dioxide buildup was the biggest factor," says VanToai. "Carbon dioxide is toxic to plants, causing them to turn yellow, become stunted and drop leaves, resulting in yield reductions, and, in some cases, death."

Carbon dioxide danger

Researchers discovered that soybean plants adapt to low or no oxygen by producing additional roots and modifying the stem to help transport oxygen from the shoot to roots. Soybeans, however, are susceptible to carbon dioxide.

The carbon dioxide concentration of non-flooded soybean fields is about 1%, but increases to 30% to 35% after two weeks of flooding. Soybeans growing under that situation face yield reductions as high as 60%.

"Based on these findings, we were

very interested in improving the tolerance of soybeans to flooding, from the standpoint of saying, 'Well, if beans lose 60% of their yields after seven days of flooding, then varieties we develop that lose only 20% of their yields would help farmers.'"

Identifying varieties tolerant to carbon dioxide levels in flooded fields or prolonged standing water is only a piece of soybean research puzzle. Researchers also recognize the importance of identifying varieties that exhibit resistance to diseases associated with flooded soil, such as phytophthora root rot.

OARDC plant pathologist Anne Dorrance is collaborating with VanToai to identify the genes of flood-tolerance and phytophthora resistance that can be used to develop future varieties.

"The cross research is very exciting because it is helping us better understand the relationship between flooding and diseases and what it takes to keep soybean plants alive and grow in flooded soil," says VanToai.

Other researchers collaborating on the project include Rouf Mian, an OARDC researcher with USDA-ARS, and Grover Shannon and Henry Nguyen of the University of Missouri.

Pollock writes for *OSU Extension*.

Seed winter wheat successfully

By TOM J. BECHMAN

HIGH wheat prices may tempt you to grow wheat this fall, especially in double-crop territory. Thanks to Chuck Mansfield, Purdue Extension agronomist at Vincennes University, for providing a refresher course.

Hold off on planting until fly-free date. The historical date, while not foolproof, makes a good target. It varies from Sept. 22 in LaGrange County to Oct. 9 in Posey County. "It's a great guideline for protecting against barley yellow dwarf," Mansfield says. "If you plant too early, you risk more infection spread by aphids."

Ideal window. "I like planting from the fly-free date through the next two

weeks," he says. "That gives you the best shot of not getting too much growth, but enough growth so that winter heaving shouldn't be worrisome."

Planting depth. From 0.75 to 1.5 inches is acceptable; an inch is a good goal. Mansfield prefers drilling to broadcasting, because uniform depth is key.

Good seedbed. Seed-to-soil contact is critical. "However, you can still either no-till after corn or disk stalks and then drill, as long as you place seed at the proper depth," he notes. A fungus that affects corn uses wheat as an alternate host, showing up as head scab. "There's so much corn and spores travel, so that may not be a legitimate reason for not no-tilling into stalks," he says.

Seeding rate. Shoot for 1.3 million

to 1.5 million plants per acre, or up to 1.7 million seeds. "My recommendations may be on the high side, but you need 30 to 35 plants per square foot for maximum stand," he notes.

Fall fertilizer. Mansfield prefers applying 100 to 120 pounds of diammonium phosphate in the fall. That delivers 18 to 21 pounds of nitrogen, plus 46 to 55 pounds of phosphate per acre.

Seed treatment. One year test results haven't shown an economic response for treatments supposedly aimed at stopping aphids. "But we did see a tremendous response to spring applications," he says.

■ See the full version of this story at www.OhioFarmer.com.