

CHECKPOINT

NEWSLETTER FOR PENNSYLVANIA SOYBEAN PRODUCERS



Weed Specialists investigate pokeweed control tactics

Pokeweed is an increasing problem in Pennsylvania fields and can be a tough weed to control due to its perennial life cycle and ability to regrow from a large, persistent taproot. Penn State Weed Specialists Kelly Patches and Dr. Bill Curran are investigating more efficient pokeweed management strategies through a research project supported by the soybean checkoff.

One of the problems with pokeweed is that it is capable of producing an abundance of seeds—previous research has reported 150 berries per plant and about 10 seeds per berry. “Birds eat the berries and spread new infestations wherever these birds fly or roost,” says Patches. Like other weeds, pokeweed also competes with the crop for nutrients, water, and sunlight, potentially reducing both yield and quality.

Pokeweed populations seem to be on the rise in recent years in Pennsylvania field crops. There may be several reasons for this including the increase in reduced- and no-till production practices. Pokeweed is generally not a problem in crop fields exposed to tillage. That’s because one of the most effective ways to combat pokeweed is through mechanical means, by plowing and disking to suppress or eradicate the weed.

Another reason for the increase in pokeweed could be the reduction in the use of soil residual herbicides, particularly in soybeans (because of Roundup Ready) and perhaps

lower use rates in corn (e.g. Atrazine).

“The main goal of our research is to learn more about the biology of pokeweed and how it behaves so we can better time control tactics,” says Patches. “We currently have two biology studies in progress: one to determine the longevity of buried seeds and another to clarify the emergence period of new seedlings.”

Pokeweed seeds can reportedly remain viable for up to 40 years and accumulate in the soil until conditions are right for germination to occur.

“For the longevity study, seeds were buried in mesh bags last fall at two different depths to simulate different tillage events,” Patches explains. “Some of the buried seeds will be exhumed this spring and tested for viability and others will remain in the soil for up to a year.

“For the emergence period or timing study, seeds were sown in the fall and emerged seedlings are being counted every two weeks throughout the season. The impact of emergence timing on pokeweed growth and seed production will also be assessed.

“The second goal of our research is to examine the effectiveness of different herbicides for pokeweed control in no-till soybean and corn. We will be looking at herbicides, application timing, and spray volume to try to discover the best management tactics for pokeweed control.”

Do you have a pokeweed problem?

The pokeweed research is being conducted at Penn State’s Russell E. Larson Research Farm near State College, but the researchers are also looking for additional locations.

If you have a problem with pokeweed on your farm and are interested and willing to work with the researchers in this important study, please e-mail Kelly Patches at pokeweed@psu.edu.

See page 6 for suggested
Pokeweed Management Tactics



Sentinel plot program sounds early warning signal

The threat of destructive insects and plant diseases is an annual problem in Pennsylvania soybean fields. To manage these threats to crop production, Extension personnel typically recommend an Integrated Pest Management program (IPM) that relies heavily on understanding local populations of pests to make informed, economical pest management decisions.

Scouting is the cornerstone of Integrated Pest Management. For both insect pests and plant diseases, understanding local populations requires scouting fields regularly and assessing pest population sizes. That information can then be applied to economic thresholds to determine if it is in the grower's best economic interest to apply a management tactic. Only by knowing the kind, number, and location of insect, weed, and disease damage can growers make informed decisions by weighing the amount of damage expected from a particular pest, the crop value, and the treatment cost.

Scouting, however, is time-consuming. That's why the Pennsylvania Soybean Board is funding a sentinel plot program to provide a valuable resource that soybean growers can consult to determine what pest populations are active around the state or in their region.

In this effort, Penn State Extension will regularly scout fifteen typical soybean fields across the state, reporting significant populations of plant diseases and insect pests. These reports will be available to growers via Penn State's weekly newsletter the *Field Crop News* (<http://extension.psu.edu/field-crop-news>) and on a Penn State website.

"The objective of the program is to inform growers about what they may find active in their fields. The expectation is that growers will then be able to better direct the scouting efforts in their own fields," says Penn State entomologist Dr. John Tooker. "We'll also be scouting 30 or so additional fields in Lancaster and surrounding counties for brown marmorated stink bugs so we can keep soybean grower apprised of the risk from this invasive pest species." ✓



Soybean variety trials expanded to Blair County

For soybean growers, there's no other single management decision that has as much potential for impacting returns as variety selection, says Dr. Greg Roth, Professor of Agronomy at Penn State. Roth should know. He and his colleagues at Penn State have conducted variety trials for more than two decades. This soybean checkoff-funded research is designed to help Pennsylvania farmers select the best variety with the right mix of soybean genetics and defensive traits for their soils and cropping practices.

As in past years, soybean varieties will be evaluated at test plots at Penn State's Rock Springs, Pa. research farm in Centre County, and at the Landisville research farm in Lancaster County. This year, a third plot location in Blair County is being added to evaluate commercial soybean varieties there. "Soybean production is growing in this region with many intensively managed and high yielding acres," says Roth, who heads the variety trials.

"We split our soybean evaluations into early and late groups so that producers can assess these maturities differently," adds Roth. "We're also doing more evaluation of specialty conventional soybeans with USDA and some private companies to address the growing feed and export markets in the state. These are high protein and food grade lines with potentially high yields."

Tests will likely include over 100 lines, with early and late Roundup Ready tests at each of the three locations. The Rock Springs and Landisville sites will include conventional and non-Roundup Ready lines, including some high protein and food grade varieties. The Landisville site will also have a double crop test following small grains.

FOR MORE INFORMATION:

The tables from the 2002 - 2011 Soybean Variety Test Reports are available in Microsoft Excel format at <http://cornandsoybeans.psu.edu/soyvarietytests.cfm>. ✓



MAXIMIZE YIELD IN **DOUBLE** CROP BEANS

Pennsylvania's soybean acreage has increased nearly seven fold over the last 20 years, from approximately 60,000 to over 400,000 acres.

Although soybeans are basically a cash crop, the acreage being used as a farm-grown protein source is increasing yearly.

Limited forage supply and the forecasted high market price of soybeans has offered growers the opportunity to plant soybeans after small grain silage and or grain harvest in many areas of the state.

In this issue, Penn State Extension Crop Specialist Del Voight shares some considerations to maximize yield in the later planting of soybeans.

DOUBLE CROP SOYBEAN CONSIDERATIONS

*Del Voight, Penn State Extension,
Integrated Crop Management*

Varieties grown in Pennsylvania show the indeterminate characteristics. This difference in growth habit is one of the main reasons row spacing and population recommendations differ between northern and southern growing areas.

As is true for other grain crops, soybean growth and development are influenced by temperature. Soybean, however, is very sensitive to photoperiod, or day length, and does not move from vegetative to reproductive growth until a critical day length is met. This requirement restricts a variety's adaptability to a band about 150 miles north and south of its origin. Day length does not restrict the adaptability of varieties planted at the same latitude (east and west).

Soybean varieties are placed in one of 12 maturity groups. These range from 00 (Canada) in the north to X in the south (Florida). Since Pennsylvania falls within the same latitudes as the major growing areas of the Midwest, our growers have access to the same varieties. These include varieties in maturity groups II, III, and early IV.

For double cropping it is suggested that the same full season varieties be planted to maximize the height of the crop before the longest day of the year triggers the plants to begin flowering. The best timing is to plant the soybeans as early as possible after a small grain. This requires timely small grain harvest, followed with a baler for straw. Drill to plant, ideally, by July 1 at the latest. There are cases where planting later than this may pull through, but July 1 is the goal.

VARIETIES

Selecting a variety for proper maturity, disease tolerance, standability, and yield performance is essential for successful soybean production. Maturity is identified by maturity groups, as described at left.

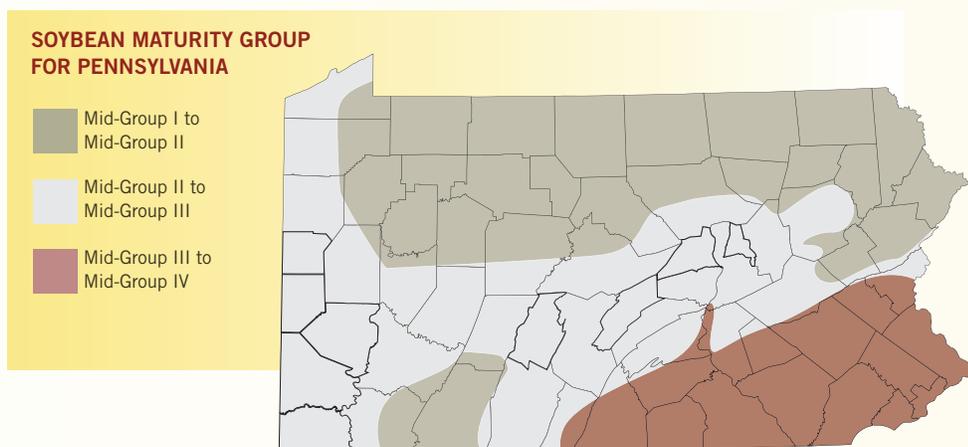
The map below shows suggested maturity groups for each county in Pennsylvania. There is a trend in the seed industry to include a variety's relative maturity as part of its name. For example, company ABC would name a late group III as ABC 3850 whereas an early group III would be ABC 3125.

Soybean varieties are developed mostly by private industry. Nearly all of the soybeans grown in Pennsylvania are

VARIETIES

trans-genic. Most of these are glyphosate tolerant, although other traits such as glufosinate, dicamba, and ALS resistant soybeans are increasing in use.

Performance data for many of these varieties are reported in the annual publication *Soybean Performance Report*, available from county offices of Penn State Cooperative Extension and online at cornandsoybeans.psu.edu. For double cropping soybeans, the weed pressure is typically reduced and the need for application of a weed control tactic is minimized and reduced costs of treatment are feasible.



DOUBLE CROP BEANS AFTER WHEAT OR BARLEY

For double crop soybeans planted after wheat or barley, drought may limit yield and crop performance because of low germination. Planting soybeans into moisture is recommended and ensuring rain is in the forecast may avoid this condition.

Bin run grain should not be used for seed, since most seed now is a Roundup Ready variety and saving the seed from these is illegal. Even for conventional varieties, the practice is not likely to be profitable. Studies comparing high-quality seed with bin run seed indicate that high-quality seed has an approximately 3-bushel-per-acre yield advantage. Certified seed offers the best assurance of quality. When using uncertified seed, make sure that the seed has been cleaned and that germination and purity tests have been conducted.

NUTRITIONAL REQUIREMENTS

Determine lime and fertilizer needs by soil test. Soybean in rotation can make use of fertilizer applied to the previous crop; however, this does not eliminate the need for a sound fertility program. Maintaining a pH between 6.5 and 7.0 is critical. Typically with double crop soybeans there is no need for fertilizer applications.

Soybean that has been properly inoculated with nitrogen-fixing bacteria rarely respond to nitrogen fertilization. If the previous year's crop was not soybeans, inoculate seed with fresh, viable, nitrogen-fixing bacteria immediately before planting. Recent research results indicate a 70% chance for a 2.0 bushel-per-acre yield increase when inoculating seed planted into fields growing soybean every other year. Triple the inoculant rate if soybeans have not been grown previously in the field. For more information, see *Agronomy Facts 11: Inoculation of Forage and Grain Legumes*.

If pH is below 6.0 and is not to be corrected with lime, apply molybdenum as a seed treatment at planting. This helps to ensure proper nitrogen fixation.

ESTABLISHMENT

Soybean seed requires more water for germination than seeds of many other grain crops, therefore planting in soils with adequate soil moisture is ideal. In addition to adequate soil moisture, there should be good seed-to-soil contact to ensure adequate water movement into seeds.

Soybean can be established with any tillage-planting (row crop or grain drill) system. It is critical, however, that enough tillage occur to provide a seedbed adequate for proper planter operation. Seed should be placed 1¼" deep normally or to moisture without planting deeper than 2" in depth. Planting too deep will result in poor emergence. Planters should be adjusted so that the seed depth is as uniform as possible.

Some soils are prone to crusting. If soil forms a crust before beans emerge, break it with a rotary hoe or spike-tooth harrow. Harrow very shallowly.

PREFERRED ROW WIDTH

The preferred row width for double crop beans is 15" or less. The yield difference between wide rows (30") and narrow rows (7") is minimal when planting in late April and early May. As the planting date is delayed past mid-May, the yield advantage for narrow rows increases. Double-crop beans should be planted in approximately 15" rows or less, or as

narrow as your equipment allows.

Plant based on seeds per acre rather than pounds of seed per acre. Seed size can vary from 1,800 to 3,000 seeds per pound, with an average of 2,500 per pound. The optimum plant population for full-season plantings is 150,000 plants per acre. This is increased to 200,000 when planting double crop in late June and early July. (See table below for seeding rates.)

SEED TREATMENT

The use of seed treatments for both insect and disease management are common on earlier planted soybeans. Research is underway to determine the benefit of seed treatments in double crop soybeans. There are numerous farm-based accounts of yield enhancement testimonials. At this point, most double crop beans do not require the aid of seed treatments and since purchased treated soybeans need to be utilized, it would be unwise to order them without the ability to discard them if there are beans left after planting.

Studies suggest that soybean plants have a tremendous ability to compensate for missing plants. They do this by developing more branches and podding more heavily, overcoming any potential yield loss from missing plants. Reduced yield resulting from poor stands may still be more profitable than replanting a field, which incurs additional costs and means a



lower yield potential because of the later planting date.

NO-TILL

The use of no tillage continues to increase. These methods can be used to establish soybeans. On sites with long slopes, no-till planting into corn residue is suggested for adequate erosion control in corn-soybean and corn-soybean-small grain rotations. Proper planter adjustment is the key to successful establishment in conservation tillage-planting systems.

FORAGE PRODUCTION

Interest in using soybean for supplemental forage has increased over the past few years. USDA-ARS recently has released several varieties that were developed for forage production. Donegal is the variety suggested for most of Pennsylvania. Forage varieties are late maturing and cannot be grown for seed. Late-maturing non-forage varieties also can be used for forage.

SEEDING RATES AND PLANT POPULATION ESTIMATES FOR SOYBEAN

Row width(inches)	Number of seeds planted/ft row ¹		Number of plants/25 ft. row	
	Full Season ²	Double Crop	Full Season	Double Crop
7	2.5	3.5	50	65
10	3.5	4.5	70	95
14	5.0	6.5	100	135
15	5.0	6.5	110	145
21	7.0	*	150	
24	8.0	*	170	
30	10.0	*	215	

¹ Based on 85% germination (full season = 176,000 seed/A, double crop = 235,000/A)

² Full season = 150,000 plants/A; double crop = 200,000 plants/A

* Double-crop beans should be planted in row widths of 15" or closer

The number of seeds planted per foot of row is based on 85% germination and an optimum population of approximately 150,000 plants per acre for full-season beans and 200,000 plants per acre for double-cropped beans.

First, adjust the seeding rates based on germination of the seed. Then, increase the seeding rate by:

- 5% for each planned rotary hoeing
- 10% for rough seedbeds
- 10% for short-season varieties
- 10% for cold soils

Decrease the seeding rate per acre by:

- 10% if lodging has been a problem
- 10% if planting a lodging-susceptible variety

These suggested adjustments to seeding rates are not additive. For example, planting no-till in a cold soil does not mean increasing the seeding rate 25%.

To avoid overplanting, calibrate planters carefully. One extra seed per foot of row equates to approximately 75,000 additional seeds per acre when planting in 7" rows.

SUGGESTIONS FOR GROWING SOYBEAN FOR FORAGE

- **Seeding date:** Early May to mid-July
- **Seeding rate:** 200,000 to 225,000 seeds per acre
- **Row spacing:** 7" to 30"; wider spacing can be used if planting in early May
- **Seeding depth:** 1.25"
- **Fertilizer:** Follow the soil test recommendations for soybean harvested for grain
- **Herbicide use:** Check the herbicide label for any restrictions on feeding to livestock
- **Harvest date:** Harvest during seed fill and before leaf drop. Moisture will be between 70% and 75%.

In most cases, forage soybean is used as a supplemental forage and planted following winter grain harvest. Soybean also has been planted, following first cut, in old alfalfa stands that will be rotated the following year.

YIELD AND HARVEST

Harvest considerations for double crop soybeans can be difficult depending on frost and other climatic factors. Typical double crop beans after wheat and barley range from 30-50 bu./acre and the economics of 30 bu./acre soybeans depend on scrutiny of application of herbicides and insecticides. In-field assessment is the best means to determine if other yield enhancement tactics are profitable to consider.

Another area that is slightly different than full season soybeans is harvest moisture. Many times the beans tend to be on the wetter side at harvest due to the later maturing timing and conditions in November. It is important to consider harvesting the soybeans at slightly higher moistures, perhaps as high as 16%. A call ahead to the mill alerting them will allow for beans to be taken care of properly to dry down to 13% moisture for storage.

Typical discount tables would indicate it is better to take soybeans to the mill a little wetter than drier since most mills adjust the crop to 13%, so sending beans at 11% moisture gives the mill an extra 2% of dry matter free of charge. For many growers roasting the soybeans is a consideration to ensure the beans are in condition to store as well. This is particularly true if used as a protein source for livestock. ✓

Double crop soybean recommendations

- **Plant in narrow rows** (*less than 15 inch*)
- **Select full season varieties**
- **Plant 1.25" when moisture is present; 2" max**
- **Increase seeding rates to establish 200,000 plants per acre**
- **Plan on one herbicide application**
- **Watch for leaf-feeding insects**
- **Timely harvest before snow and below 16% moisture.**
- **Consider roasting.**



The Pennsylvania Soybean Board administers the national soybean checkoff program, approved by Congress in 1990. Under its terms, farmers "check off" 50 cents on every \$100 at the first point of sale of their beans. Half goes to the state, with the remainder to the United Soybean Board. The money is used to fund or support soybean research, market development and education.

The Pennsylvania Soybean Board promotes the growth and development of Pennsylvania's soybean industry. The board membership is composed of soybean producers from across the state.

- Daryl Alger, Chairman, Lebanon, PA
- Brian Kreider, Vice-Chairman, Lebanon, PA
- Bill Beam, Secretary/Treasurer, Elverson, PA
- John Yocum, Catawissa, PA
- Jim Musser, Mount Joy, PA
- Mike Gerhart, Ephrata, PA
- Steve Hykes, Greencastle, PA
- Del Voight, Ex-Officio Member, Lebanon County Senior Extension Educator

Contact us at:

Pennsylvania Soybean Board
Northwood Office Center
2215 Forest Hills Drive, Suite 40
Harrisburg, PA 17112

Chris Herr, Executive Director
Jennifer Reed-Harry, Administrative Director

Phone: (717) 651-5922

Fax: (717) 651-5926

www.pasoybean.org

Current pokeweed management recommendations

Dr. Bill Curran, Penn State Weed Specialist

Control of pokeweed is fairly difficult with single postemergence herbicide treatments and multiple tactics are often necessary. Regardless of the crop or herbicide treatment, make sure the spray boom height is up above the pokeweed and use spray tips and a carrier volume (i.e. > 10 GPA) to maximize coverage.

In soybeans, glyphosate is fairly effective and control can be increased by tank mixing with FirstRate, Classic, or Synchrony. Again, other factors (application timing, boom height, etc.) may also play a role in successful control.

In Roundup Ready soybeans, use at least 0.75 lb ae/A applied when pokeweed plants are at least 8 inches tall. Make a second application if necessary. In soybeans that are not Roundup Ready, use Synchrony (0.375 oz/A) or Classic + Harmony tank mixes.

Do you want to serve on the Pennsylvania Soybean Board?

If you grow soybeans in Pennsylvania, and are interested in being nominated to serve as a farmer/leader on the Pennsylvania Soybean Board, contact:

Jennifer Reed-Harry
jrharry@pennag.com



Watch out for these pests in 2012

Your beans are in the ground, and now you wonder what insects are waiting to take a bite out of them. “To understand the risk from insects to the coming season’s soybeans, it is often best to review what we saw last season and then project ahead,” says Penn State entomologist Dr. John Tooker. Of all the reported insect problems in Pennsylvania soybean fields in 2011, Tooker says the most consistent were bean leaf beetle, grasshoppers, and two-spotted spider mites. ✓



Adam Sisson, Iowa State University, Bugwood.org

BEAN LEAF BEETLE

Bean leaf beetle is a native insect that has two generations per year. It spends the winter as an adult in leaf litter in wooded areas where its populations can be knocked back with a really cold winter.

“Obviously, Pennsylvania experienced a mild winter so we can expect the larger than average bean leaf populations from 2011 to remain or even grow in 2012,” says Tooker. “This pest species tends to attack the earliest emerging soybean fields and then can be problematic later in the season feeding on developing pods, and to a lesser degree defoliating soybean plants.”



GRASSHOPPERS & SPIDER MITES

The two other notable pest species attacking soybeans last year were grasshoppers and two-spotted spider mites.

“Both of these species thrive in the hot dry conditions that blanketed Pennsylvania in July of 2011, as well as parts of the summer of 2010,” says Tooker. “As a result, these populations appear to have grown over the past few years and if we get hot dry conditions in 2012, growers need to keep an eye out for these pests.”



SLUGS & STINK BUGS

Tooker says the other two pest species that should be mentioned are slugs and brown marmorated stink bugs.

“Due to the wet fall of 2011 and mild winter of 2011-2012, slug populations around the state appear quite healthy. If we get moist conditions at or after planting this spring, no-till growers will need to be prepared for slug damage. Slugs are best managed with an integrated approach that combines all available tactics. See Penn State’s recently updated fact sheet (<http://ento.psu.edu/extension/factsheets/slugs-as-pests-of-field-crops>) for information on slug management.” Much of the information on this fact sheet is a result of research that was funded by the Pennsylvania Soybean Board.

The other pest to watch out for in 2012 is the brown marmorated stink bug.

“Many will recall the summer of 2010 when brown marmorated stink bugs really exploded and populations accumulated in peoples’ homes, orchards, vegetable gardens, and soybean fields, particularly in southern Pennsylvania,” says Tooker. “We were lucky that populations dropped for 2011, but we’re not sure what to expect for 2012. Penn State Extension will track populations in our sentinel plot project and provide updates via our weekly Field Crop News (<http://extension.psu.edu/field-crop-news>).”



Do you have what it takes to be a WINNER? 2012 Soybean Yield Contest

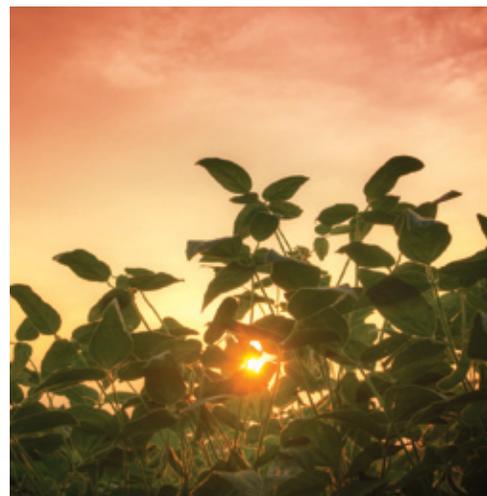
The Pennsylvania Soybean Yield contest highlights practices that produce maximum economic yields and encourages the production of high-quality beans. Producers in four separate growing areas in Pennsylvania have a chance to be recognized.

Don’t miss this opportunity to win a great prize and bragging rights! First prize is a trip for two, including transportation and accommodations (up to \$2,000), to the 2013 Commodity Classic at the Gaylord Palms in Kissimmee, Florida.

Sign up TODAY!

Your entry must be postmarked by August 23, 2012.

For complete rules and an entry form, go to www.pasoybean.org.



2012 SOYBEAN GROWERS FIELD DAY
AUGUST 23, 2012
LANDISVILLE, PA
9:00 A.M. – 3:00 P.M.

The Pennsylvania Soybean Growers Field Day is a great opportunity for soybean growers to observe research trials funded by the soybean check-off and interact with researchers and others involved in soybean production and utilization.

Join us for a tour of Penn State's Extension Service Landisville research farm and see variety trials funded by the soybean checkoff. Workshops include the latest soybean checkoff-funded research on animal agriculture (the #1 customer for soybean meal) and crop production management. Ask questions of the experts, compare notes with your fellow soybean producers, and enjoy a hearty lunch provided courtesy of the Pennsylvania Beef Council and the Pennsylvania Soybean Board.

This event is FREE, but we ask that you pre-register by August 17 so we can prepare meals and handouts. Registration forms are available online at www.pasoybean.org or by contacting Diane Mshar at dmsnar@pennag.com. Thank you in advance for your consideration. ✓

Transportation is available!

Group transportation to the Field Day will be available from a number of counties located in northern, western and central Pennsylvania. Contact Diane Mshar for details and to reserve your seat. Space is limited, and is available on a first-come/first-served basis.

WWW.PASOYBEAN.ORG



Date: August 23, 2012 (rain or shine)

When: 9:00 a.m. – 3:00 p.m.

Where: Penn State's SEAREC Research Center (Landisville Farm)

Cost: FREE. Lunch is provided. RSVP is requested.

CCA and Pest Education credits will be offered.

AG PROGRESS DAYS • AUGUST 14-16, 2012 • ROCK SPRINGS, PA

If you plan to attend Ag Progress Days, don't miss the tour of the Sustainable Soybean Production demonstration plots.

There will be two tours daily where university researchers will be on hand to review some of the production practices that are essential for high yielding, economical and environmentally friendly soybean production. The focus is on top yielding varieties, no-till, cover crops and weed, insect and disease management strategies.

This demonstration builds on the findings of a recent United Soybean Board report that showed that increasing soybean production can be profitable and environmentally sustainable when appropriate management practices are used to manage soil erosion, runoff, weeds, insects and disease. The demonstration program is sponsored in part through checkoff funding from the Pennsylvania Soybean Board and the United Soybean Board, and is a collaboration of faculty from Ohio State, Penn State and USDA-ARS.

And, while you're enjoying Ag Progress Days, be sure to stop by the Pennsylvania Soybean Board booth, located in the Ag Choice Building. We'll look forward to seeing you!

Ag Progress Days is Pennsylvania's largest outdoor agricultural exposition. Sponsored by Penn State's College of Agricultural Sciences, the event is held at the Russell E. Larson Agricultural Research Center at Rock Springs, nine miles southwest of State College on Pa. Route 45.

AGSCI.PSU.EDU/APD