

# CHECKPOINT

NEWSLETTER FOR PENNSYLVANIA SOYBEAN PRODUCERS

## PALMER AMARANTH: A GROWING THREAT TO SOYBEAN FARMERS

**Palmer amaranth, a species of pigweed that is particularly competitive and aggressive, was first identified on seven Pennsylvania farms in 2013,** and is now on 30 or more farms across at least a dozen counties in the state, reports Penn State Extension Weed Specialist Dwight Lingenfelter. “If Palmer amaranth is identified on your farm, aggressively manage the weed to prevent seed production and its spread,” he says.

This destructive weed is costly to soybean farmers. Season-long competition by Palmer amaranth is estimated to reduce soybean yield by as much as 68 percent, and fighting the weed can double or even triple annual herbicide costs.

“Palmer poses unique management challenges, but containing new infestations and preventing their spread is a critical first step to managing this new threat,” says Lingenfelter. “Palmer amaranth is difficult to control because it emerges throughout the growing season and has a rapid growth rate. It has a wider window of emergence than many summer annual weeds and continues to emerge throughout the growing season. This extended emergence pattern makes it difficult for pre-emergence and non-residual post-emergence herbicides to control later-emerging plants.

“Over the last decade, Palmer amaranth has established potential resistance to several herbicides, including glyphosate (e.g. Roundup) and the Group 2 herbicides (ALS-inhibitors.) Some populations are also resistant to Group 3 (microtubule inhibitors), Group 5 (Photosystem II), and Group 27 (HPPD-inhibitors) herbicides.”

The high relative growth rate of Palmer amaranth makes control with post-emergence herbicides difficult. Palmer amaranth can grow as much as 1 to 2 inches a day. A mature plant may reach well over 5 feet.

“In order to avoid Palmer amaranth infestations, it’s necessary to scout fields for unusual looking pigweed species or situations where herbicide control was not effective,” advises Dr. Bill Curran, Penn State professor of Weed Science. “It is critical to control this weed before it produces seeds because just a few Palmer amaranth plants can lead to a major problem.” A single female plant can produce upward of 600,000 seeds per plant, so it’s important to reduce seed production from this weed to stop its further spread.



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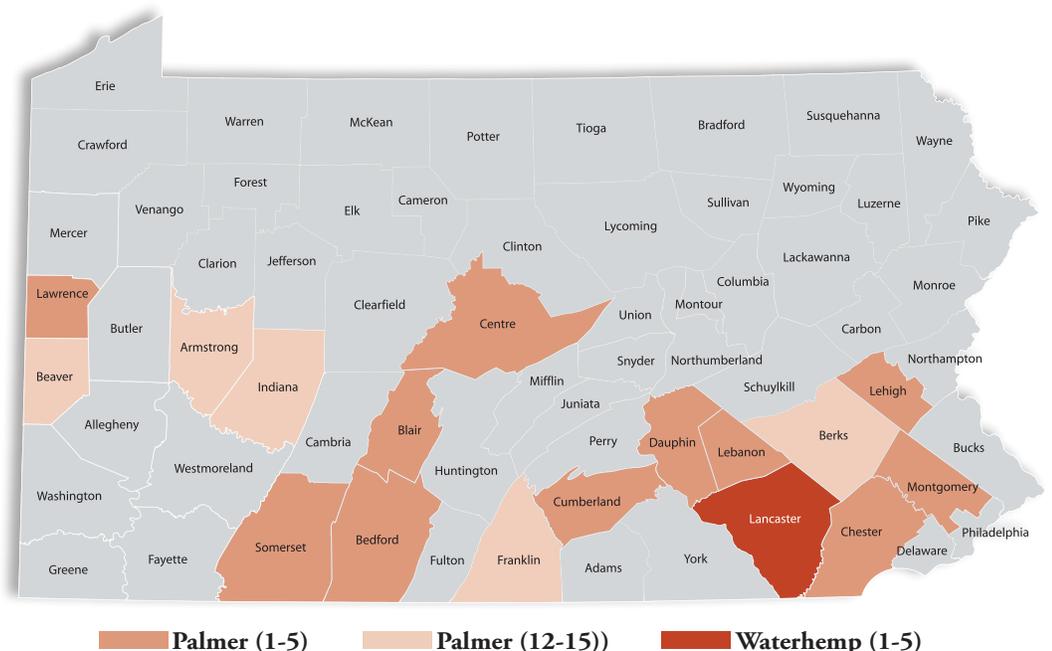
## HOW TO IDENTIFY PALMER AMARANTH

- 1 Palmer amaranth plants look similar to other pigweeds, especially as seedlings  
*Photo courtesy of University of Illinois*
- 2 Palmer amaranth can sometimes have a single short hair at the tip of younger leaves. *Photo courtesy of University of Illinois*
- 3 Palmer amaranth has a long petiole (thin "stalk" that attaches the leaf to the stem of the plant). The petiole will be as long, or longer, than the length of the leaf. *Photo courtesy of Penn State*
- 4 Sometimes, Palmer amaranth leaves will also have a white "V" mark or dark red/purple patch (watermark) on the leaf blade (spiny amaranth as well as the other pigweeds can also sometimes have this mark). *Photo courtesy of Penn State*
- 5 The arrangement of Palmer amaranth's leaves form a rosette pattern making the plant look like a poinsettia. *Photo courtesy of University of Illinois*
- 6 Seed heads are 6 to 24 inches in length, the female flower bracts are sharp and can be painful to handle. Only the females produce seed. *Photo courtesy of Penn State*

## PALMER AMARANTH AND WATERHEMP INFESTATIONS AS OF LATE 2015

This map shows the number of farms in Pennsylvania counties where both Palmer and waterhemp were identified in 2015. "There are at least 30 known sites around the state, but we expect there are many more locations that have not been documented," says Penn State Weed Specialist Dwight Lingenfelter. "There might be populations in the northern part of the state but none have been documented yet, so farmers are cautioned to keep an eye out for new infestations."

*Map courtesy of Penn State*



Numbers are farms in counties where identified  
Already in MD, DE, NJ, VA

## BEST AGRONOMIC MANAGEMENT PRACTICES FOR CONTROL OF PALMER AMARANTH

- Plant only clean crop seed that is certified. State seed laws prevent crop seed contamination.
- Use integrated management practices to aggressively control weeds. For example, decreasing row widths results in faster canopy closure and shade formation. Palmer amaranth does not survive well under dense crop canopies as seeds require light to germinate.
- Manage infested fields with no-till if possible, leaving any potential seeds near the soil surface.
- Use residual herbicides (pre and post) during the growing season to prevent new flushes. Effective soil-applied (pre-emergence) herbicides are essential. Apply the full recommended rate of an effective soil-residual herbicide, prior to or soon after soybean planting.



Be sure to remove Palmer amaranth plants from the field so they do not re-root.

- Timing is important! Apply effective post-emergence herbicides to small plants that are less than 4 inches tall. It's critical that you use the full recommended rate of application. Closely monitor fields before and after herbicide application.
- With smaller infestations, physically remove plants. Pull by hand or use a hoe. Remove plants from field so they do not re-root. Bag and bury or burn removed plants along the field's edge.
- Plant corn or a perennial forage instead of soybeans in fields that are known to be infested. This provides more options for effective herbicides or alternatives for mowing and mechanical control.
- Do not combine harvest mature pigweeds. If combine harvest cannot be avoided, harvest infested fields last to avoid moving seeds away from the infested fields.
- Clean tillage and harvest equipment before leaving infested fields. For combines, compressed air and vacuum are recommended for cleanout. This is particularly important for combines with a platform header.

- Ensure that used equipment, custom machinery, imported feed or hay, imported manure and compost are not contaminated with noxious pigweed. Many fields where Palmer amaranth has been found received an application of manure from dairy cows that were fed cotton byproducts as a feed supplement.
- Monitor field edges, ditches and fencerows for noxious pigweed plants. It's important to scout after harvest, especially after silage harvest.
- Aggressively control plants to prevent seed production and spread. Compared with many other summer-annual weeds, Palmer amaranth seed is relatively short-lived in the soil. Research has shown that only 2 percent of Palmer amaranth seed remains viable in the soil seedbank after six years. However, the sheer number of seeds produced by one female plant makes the eradication of Palmer amaranth very difficult once it is established.

## RESOURCES

### ***A War on Weeds***

A pocket grower's guide to minimizing the threat of Palmer amaranth and waterhemp in the Mid-Atlantic Region.

*Available, while supplies last, through your local Penn State Extension office.*

### **Burn bags**

Eco-friendly, 45-gallon burnable bags, with printed instructions on the bag on how to dispose of Palmer amaranth.

*Available, while supplies last, through your local Penn State Extension office.*

### **Education**

The latest information on Palmer amaranth in Pennsylvania is available from Penn State at <http://extension.psu.edu/pests/weeds/palmer-amaranth>.

## Palmer Amaranth Through the Growing Season

Palmer amaranth can start to germinate in early May and continue germination through August.



Sometimes you will see Palmer plants that already have a seedhead in July, but if you look closer at the ground, there will also be seedlings just emerging as well. That's why it's important to have good residual herbicides to control it during the entire growing season.



*Photos courtesy of Penn State*



For more information and links to additional resources, visit [www.TakeActionOnWeeds.com](http://www.TakeActionOnWeeds.com).

# 2015 PENNSYLVANIA SOYBEAN YIELD CONTEST WINNERS

**Berks County farmer wins top honors for second consecutive year**

For the second consecutive year, Berks County farmer Herman Manbeck was the state's top producer in the 2015 Pennsylvania Soybean Yield Contest, sponsored by the Pennsylvania Soybean Board. His winning yield was 101.77 bushels per acre. Manbeck won the honor in the 2014 contest with a yield of 94.49 bushels per acre.

Berks County farmer David Wolfskill, of Wernersville, Pa., placed second in the commonwealth for the second consecutive year with 96.15 bu./acre. In third place state-wide was Lancaster County soybean grower Merle Stoltzfus of Lititz, Pa., with a 95.33 bu./acre yield.

According to contest coordinator and Penn State Senior Extension Educator Del Voight, 16 of the 35 participating growers exceeded 80 bushels per acre. The mean yield of the contest entrants in 2015 was 73.42 bu./acre, down from the 2014 average of 75.48 bu./acre.

"Growers throughout the state cited a dry August and too much or too little rainfall as the major issues impacting yields," says Voight. "Some also cited white mold infestation and damage from Japanese beetles, deer and groundhogs as challenges in 2015."

94.3% of the growers entering the contest used a seed treatment. Those who used a seed treatment averaged 74.41 bu./acre while producers who did not use treated seed averaged 57.08 bu./acre.

The contest recognized not only the state-wide grand champion, but also the top growers in each of five regions of Pennsylvania, based on maturity maps.

The contest was launched by the Pennsylvania Soybean Promotion Board in 1992. A summary of the crop production practices from the 2015 contest entrants is available on the **Yield Contest page** at [www.pasoybean.org](http://www.pasoybean.org). You'll find the page under Forms>Growers.

## 2015 PA Soybean Yield Contest State & Regional Winners \*Also state yield winner

REGION	GROWER	YIELD (bu/ac)	CULTIVAR	COUNTY
South Central	Herman Manbeck*	101.77	Pioneer 35T58R	Berks
Central	Leslie Bowman	74.14	Pioneer 93Y84	Franklin
Southeast	John Frederick	73.39	Hubner HS 34A16	Bucks
Northern	Richard Snyder	69.55	Doebler D83012 RR	Lycoming
Western	Thomas Hoovler	66.15	Asgrow 30-33	Mercer

## 2015 PA Soybean Yield Contest COMPARISON OF METHODS

<b>SEED</b>	<b>94.3% used treated seed</b>
Seed Treatment (94.3% of entries)	74.41 bu/ac
No Seed Treatment (5.7% of entries)	57.08 bu/ac
Average Seeds Per Pound	2,619.79
Average Seed Drop	161,797.14
Calibrate Seed Equipment	42.90%
<b>RHIZOBIA INOCULATION</b>	<b>94.3% of entries inoculated</b>
Dry (31.4% of entries)	61.79 bu/ac
Liquid (51.4% of entries)	76.78 bu/ac
None (2.8% of entries)	83.41 bu/ac
<b>SOIL TEST</b>	<b>80% soil tested</b>
pH	6.73
P in p205 lbs per acre	171.22
K in K20 per acre	176.22
<b>FERTILIZER</b>	<b>8.6% of the producers added nitrogen fertilizer 17% of entries used foliar fertilizer products</b>
Foliar (17% of entries)	76.35 bu/ac
No Foliar (11% of entries)	68.58 bu/ac
<b>HARVEST</b>	<b>80% soil tested</b>
Average Plants at Harvest	124,901.91
Average Harvest Date	10/13/2015
Cover Crop	62.9% of producers used a cover crop after harvest

*Source: Del Voight, Extension Educator, Penn State University*

## YIELD CONTEST WINNERS ATTEND COMMODITY CLASSIC

The state and regional winners of the 2015 Pennsylvania Soybean Yield Contest attended the Commodity Classic, the largest farmer-led, farmer-focused convention and show in the country. They went with the anticipation of bringing home new ideas for their own farms, and they weren't disappointed.

The winners of the Soybean Yield Contest traveled to New Orleans in March, where they were among a record-breaking crowd of nearly 10,000 attendees. For three days they attended world-class educational sessions with an impressive line-up of industry, university and government leaders. They saw state-of-the-art technology and the latest products, heard about new management practices and ways to improve efficiency, and perhaps most important of all, had the chance to network with fellow soybean growers from throughout the country.



**Herman Manbeck**

**South Central Region and Overall State Yield Contest Winner**

*"There's so much to learn by going to the Commodity Classic. I spend every day looking at ways to increase yields. I was impressed by the magnitude of the trade show, the quality of the seminars, the number of people attending, and all the different products and ideas."*



**John Frederick**

**Southeast Region Yield Contest Winner**

*"You can always learn when you get together with other farmers. In the grower panel I attended, they talked about taking care of the back end of the crop instead of just concentrating on planting rates and fertilizer rates. The back end of fungicide and foliar applications – that's something I'm going to look at."*



**Leslie Bowman**

**Central Region Yield Contest Winner**

*"I saw a lot of things at the trade show that I had never even heard of before. I found the early riser sessions to be good where they talked about fertility and bioag. There are some fascinating products."*



**Richard Snyder**

**Northern Region Yield Contest Winner**

*"As farmers, we have the big job of feeding the world. I think every farmer needs to go to at least one of these events because there's a great deal of knowledge to be gained here."*



**Thomas Hoover**

**Western Region Yield Contest Winner**

*"I met farmers from all over the country with some pretty impressive yields, and it was interesting to find out how they are managing their crops. I hope to learn from them."*



The latest technology, product innovations, and ideas are on display for soybean growers at the Commodity Classic.

### Plan to enter the 2016 PA Soybean Yield Contest

The state and regional winners of this year's Pennsylvania Soybean Yield Contest will win a trip to the 2017 Commodity Classic, which will be held from March 2-4, 2017, in San Antonio, Texas. **Entry forms and information on the contest are available at [www.pasoybean.org](http://www.pasoybean.org).**

The Commodity Classic is produced by the National Corn Growers Association, American Soybean Association, National Association of Wheat Growers, National Sorghum Producers, and the Association of Equipment Manufacturers.



# STEPS TO GROWING DOUBLE-CROP BEANS

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**Double cropping soybeans after small grain harvest is popular in many soybean producing states.** Typically as July progresses after small grain harvest, producers in Pennsylvania no till soybeans. But if there's continued rain and ample moisture in the soil, many producers will continue to plant. "I have seen fields planted directly after barley that emerged almost immediately with the rains," says Del Voight, Penn State Senior Extension Educator.

Planting soybeans as early as possible following small grain harvest increases the potential for a profitable double-crop system. "It takes about 50-80 days depending on maturity and planting date for soybeans to develop pods and dry seed," Voight continues. "In a year with an average frost, that means producers must plant beans by July 15 - August 1, to be in the window for harvest based on average frost-free dates in Pennsylvania."

Voight adds, "We are aggressively researching the different parameters of double crop soybeans in the Mid Atlantic. Last year in our trials the late maturing varieties yielded 37 bu/acre."

Dr. Dave Holshour from Virginia Tech related the impact of maturity on delayed planting. For April and May plantings, a 3-day delay in planting resulted in a 1-day delay in maturity. For example, planting 30 days late would cause a 10-day maturity delay.

However in the June and July plantings, a 5-day delay in planting resulted in only a 1-day difference in maturity. "The most important thing is to plant a maturity group that will grow as long as possible in the vegetative stage in order to gain height before flowering," says Voight. "This allows for an adequate canopy for maximum yield and will still mature before a frost.

"We are looking at other parameters

for double-crop soybeans that might prove useful in the future to further add yield to this late plant timing," he continues. "We are revisiting row width, date of planting, growth regulators, seed treatments and other practices to ensure recommendations stay current."

Stay tuned for more information as the Mid-Atlantic Soybean Research Group, funded by the soybean checkoff, focuses on double-crop production.

## 6 STEPS FOR DOUBLE-CROP BEANS:

**1** Plan to establish at least a final stand of 180,000 ppa so as to achieve the targeted final stand of a dropped population of 200,000 for double crop beans planted prior to July 5. After July 5, 220,000 ppa drop might be in order to ensure ideal canopy cover.

**2** Plant narrow rows less than 15 inches: 7 inches or narrower preferred. There is less time for the soybeans to gain height to pod so the narrow rows allow for more beans to grow at higher populations.

**3** If the field has visible weeds, be sure to burn down to ensure weed competition is kept to a minimum.

**4** Set a realistic economic target. Traditional double crop yields of 30-50 bu/acre is not out of the question.

We typically see about a 50% response the first week of July. At \$9/bushel soybeans, there is some, but not a lot, of room to spend input costs over and above that which needs to be spent to make the

crop. The table at right best illustrates the impact of planting date.

Last year we artificially dried the wheat to allow for more timely soybean planting. That yielded interesting results where we saw a 7 bu/acre gain in yield between the early planting (July 7) and late planted (July 22) double crop soybeans.

**5** Be aware that the potential for an early frost is possible. If forage is needed, consider management for a forage use of the soybean. If the goal is forage supply, then perhaps sorghum, Sudan grass or other annual crop may be a better selection.

**6** There has been some discussion about moving to a shorter maturity for double-crop beans. Past experience in this area would suggest full season maturities for double crops may out-yield short season maturities.

Double crop beans planted with full maturity in our test plots over the last several years have matured with no ill problems in the fall.

**Approximate yield response of soybean to changes in planting date**

Planting Date	Percent of Full Yield Potential
May 10	100%
May 20	98%
May 30	95%
June 10	88%
June 20	76%
June 30	70%
July 10	60%

*Developed from Ohio, Indiana, Minnesota, and Pennsylvania data*

# BRAZIL'S INVESTMENT IN INFRASTRUCTURE HEATING UP COMPETITION FOR U.S. SOYBEAN PRODUCERS

**Although the United States is currently the world's leading soybean producer, this status may not be sustained without continued investment in the U.S. transportation system.** Right now, the U.S. has the rivers, roads and rails to move soybeans from field to market, but Brazil's soybean farmers continue to gain on their U.S. counterparts, with big plans to improve their ability to move more soybeans into export position.

Soybean producer Bill Beam from Elverson, Pa., who serves as chairman of the Pennsylvania Soybean Board and on the United Soybean Board, joined two other United Soybean Board soy checkoff farmer-leaders and two American Soybean Association farmer-leaders on a two-part fact-finding mission to see firsthand the status of Brazil's infrastructure. They saw advancements that are being made now, along with improvements still in the planning stage. Altogether, these projects could improve Brazil's ability to compete with the U.S. on the global market. Brazil is currently the world's second largest grower of soy, and the third for corn.

"I was under the impression that Brazil's transportation infrastructure was primitive, basic and highly inefficient," says Beam. "I was very impressed with the heavy investment Brazil is making to handle soybeans and how efficiently its

transportation system operates. And the country is still building; it hasn't peaked yet. It's just a matter of time before the country has a very efficient system from one end to the other."

On their first trip, the group stopped at Cuiaba, the capital city of the Brazilian state of Mato Grosso. This area is one of the key ag-production areas in Brazil. The U.S. farmers met with agribusinesses, political leaders and associations, including Brazil's largest soybean cooperative.

The group then traveled north to Belém to meet with navigation industry representatives. They learned that a floating terminal being built in Belém should be operational in 2016.

Afterward, the farmers headed toward the coast to Sao Luis. There, they visited the Port of Itaqui to see export elevators, meet with river transport providers and learn about rail developments in the area. One of the factors contributing to this port's importance is its proximity to the Panama Canal.

Next, the group toured the Port of Santarém. Ninety percent of the grain arriving to this port comes by barge, while the rest comes by truck. In addition to visiting the port, the farmers also toured a Cargill export elevator in the area.

The farmers also traveled to Barcarena, where they saw Bunge and ADM export

elevators. During visits to the elevators, Beam and his fellow farmers learned that Cargill is currently undergoing an expansion, and ADM has plans in the works to grow as well.

On their second trip to South America, the group traveled to Argentina to meet with a private seed company and the Ag Counselor from the U.S. Embassy to talk about current production and the overall ag environment in Argentina. On a stop to a farm in Rosario, they spoke with a farmer who explained how the past policies of the Argentine government have influenced their planting and rotation and how the new policies will result in positive change for the farm sector.

The group visited a large export terminal and soy processor before going to the ExpoAgro, an annual open-field agricultural mega exhibition. There, they met with representatives from AAPRESID (no-till farmers association), CREA (farmer research organization), and ACSOJA (soybean chain association).

The group visited the ports of Santos and Paranaguá, Brazil, where a significant amount of exports move. They concluded their stay at Ponta Grossa in the heart of Brazil's traditional grain-growing region, where they met with a large farm cooperative and visited two farms.

After the mission, Jim Call, a checkoff farmer-leader and soybean farmer from Madison, Minn., who was on the mission to observe the development, says U.S. soybean farmers and the industry should feel a sense of urgency to respond with transportation improvements of our own.

"U.S. Before visiting Brazil, I doubted if they could compete with our transportation abilities. However, after seeing our number one competitor up-close, I realized Brazil's progress could affect the way U.S. soybean farmers do business. To maintain our current competitive advantage, we need to invest in our transportation infrastructure now."



The U.S. farmer delegation joined their Brazilian hosts and an interpreter on a floating dock on the Amazon River.