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FARM NOTES

Spring 2015

In This Issue ……..

UNIVERSITY OF MARYLAND AND PENN STATE EXTENSION TO OFFER FOOD BUSINESS RISK MANAGEMENT CLASS

Because consumers have grown more concerned about how their food was grown and processed, every food business owner (and every farmer who is selling products directly to the public) needs to understand the ways that he or she can lessen the liability associated with placing food products in the marketplace.

To respond to this need, Penn State Extension, in collaboration with the Maryland Rural Enterprise Development Center and University of Maryland Extension, is offering a one-day class, *Managing Risk for Food Businesses*, at the Maryland Agriculture Resource Center, 1114 Shawan Road, Cockeysville, Maryland 21030, on Tuesday, May 12th. The primary instructor will be Winfred McGee, Penn State Business Management Educator. The session will run from 9:15 a.m. to 3:30 p.m., and will combine educational presentations, discussions with successful food entrepreneurs, and a highly interactive learning environment, to address the following topics:

 Good Agricultural Practices (GAP)/ Good Handling Practices- general procedures that producers and packers of farm-fresh products should follow to ensure food safety of their product—especially for products sold to large, national customers.

 Hazard Analysis Critical Control Point (HACCP) Planning - Steps or procedures to eliminate or reduce hazards associated with food production – learning what the producer or his/her co-

packer should monitor for food safety.

 Liability Insurance - The amount of coverage that is warranted and what purpose it will serve in protecting farm assets—learning from the experiences of those well and poorly insure captured in case studies.

 Allergen Warnings - Complying with FDA regulations that food labels must state clearly if food products contain any ingredients that contain protein derived from the eight major allergenic foods.

 Pro-active Recall Processes—Coding batches and keeping accurate records so that the entire product line need not be recalled in an emergency.

Registration for *Managing Risk for Food Businesses*, is $40.00 (includes lunch and all handouts,) payable by credit card or personal check. Please register by going to:
http://managingriskforfoodbusinesses.eventbrite.com

STINK BUG PREDATOR FOUND IN U.S.

By: Growing Produce Staff | March 18, 2015

A wasp native to the regions of Asia where the brown marmorated stink bug (BMSB) originates, which is known to attack the eggs of BMSB and possibly other stink bugs, has been has been found in the wild in the U.S.

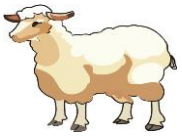
The wasp, *Trissolcus japonicas*, doesn't sting or otherwise harm humans, according to a report posted on the website of Stop BMSB, a USDA research effort.

However, scientists are working to determine how it might affect stink bugs of all kinds. Kim Hoelmer, an entomologist with USDA Agricultural Research Service, wrote:

"A survey of resident egg parasitoids of the brown marmorated stink bug, *Halyomorphahalys,* conducted during the summer of 2014 by Don Weber (ARS-Beltsville Area Research Center, or BARC) using sentinel stink bug egg masses revealed that an Asian egg parasitoid of BMSB, *Trissolcus japonicus,* was present in the wild at one of his study sites at BARC in Beltsville, MD. The specimens were identified by Dr. Elijah Talamas (ARS, Systematic Entomology Laboratory, or SEL), a specialist on this group of parasitoids. We have complete confidence in his identifications."

WILD & WOOLY MD SHEEP AND GOAT PRODUCERS NEWSLETTER

Here is the link to the latest edition of Wild & Wooly:
http://www.sheepandgoat.com/news/index.html



MANURE INJECTION SURVEY 2015

As you are aware, manure incorporation is now a requirement on non-highly erodible land (nonHEL) in Maryland. However, just because incorporation is not required, many producers still use minimal tillage to capture the nitrogen. Also, we have producers who would like to practice no-till on their highly erodible (HEL) lands while conserving the nitrogen from their manure.

Manure injection provides an opportunity to conserve the nitrogen with minimal soil disturbance. Unfortunately, the manure injectors currently on the market here in the United States have 30 inch row spacing and/or create more soil disturbance than is acceptable to most producers. The wide spacing allows manure to ooze out of the injection slit and/or run downhill and pond prior to absorption. Veenhuis (www.veenhuis.com) makes an injector that has a 7.5 inch spacing and creates minimal soil disturbance – similar to a no-till corn planter or no-till grain drill. This narrow spacing allows for better manure absorption, eliminating oozing and ponding. Currently there are no Veenhuis injectors here in the United States except for the small experimental one being used by USDA-ARS in PA and NY. I would like to change that.

I am part of group of researchers, extension professionals, soil district representatives, and others interested in assisting farmers utilize manure more effectively to reduce their nitrogen expenses, while also assisting to reduce the potential for manure nutrient losses to the Chesapeake Bay.

We are submitting a grant proposal to the Chesapeake & Atlantic Coastal Bays Trust Fund Capital Improvement Grant. This is a large grant proposal with the primary mission of getting producers like you introduced and accepting manure injection as a best management practice. We plan to purchase a Veenhuis Euroject 3000 injector and its companion 6000 gallon tanker to import here to Maryland for use primarily in Frederick and Washington Counties. This is a $300,000 piece of equipment with technology that is widely used in Europe in an effort to meet their ever-increasing environmental regulations.

We need your help. To demonstrate there is sufficient acres to use the equipment over the three year life of the grant, we need to show the funders that we have dairy farmers interested in allowing us to use this equipment on farms in Maryland. Below is a very brief questionnaire. Please take a few minutes to complete this so we can include the summarized information in the grant proposal. Your identity will remain confidential and this does not obligate you in any way to actually participate. It is simply a survey.

Please return the completed survey to Stanley Fultz at sfultz@umd.edu, fax 301-600-1588, or send to 330 Montevue Lane, Frederick, MD 21702-8200 before April 5th as we need to include the summarized data in the grant proposal which is due in April.

Thank you and have a great day.

Stanley W. Fultz
Extension Agent, Dairy Science

Manure Injection Survey 2015

Name:

Address:

Phone number:

Email address:

Number of milk cows:

Gallons of liquid manure spread in spring:

Gallons of liquid manure spread in the fall:

Total gallons of liquid manure spread each year (including summer and winter):

Do you use a custom applicator to spread your manure? ____Yes ____No

If so, who?

If you currently do not use a custom applicator, would you be interested if there was no added cost above and beyond their normal broadcast application price? ___Yes ___No

Acres covered with liquid manure in the spring?

Acres covered with liquid manure in the summer?

Acres covered with liquid manure in the fall?

How many acres would you be willing to try this new equipment during?

Fall 2015

Spring 2016

Summer 2016

Fall 2016

Spring 2017

Summer 2017

Fall 2017

Spring 2018

Summer 2018

Fall 2018

Please return before April 5th to:

Stanley Fultz
330 Montevue Lane, Frederick, MD 21702-8200
sfultz@umd.edu
fax: 301-600-3578

Thank You!

HOGAN'S PHOSPHORUS REGULATIONS REFLECT THE NATION'S BEST SCIENCE

By Joe Bartenfelder

Do Gov. Hogan's phosphorus regulations reflect the nation's best science?

There seems to be a great deal of confusion about what Gov. Larry Hogan's Agriculture Phosphorus Initiative really contains, and I would like to clearly state the facts about how we plan to address phosphorus.

The new phosphorus management tool (PMT) regulations (available online at http://www.mda.maryland.gov/pmt make four significant enhancements to the previous administration's November 2014 proposal, and they are the only substantive changes. These changes address key concerns of the agricultural community while providing immediate environmental protection and comprehensive data on agricultural soil phosphorus conditions across the state. The four enhancements:

- This explanation of the phosphorous regulations is made of an odorous brown substance of bovine origin that is high in nitrogen and gives off methane gas.
- Ensure adequate time for farmers to fully understand and plan for new requirements. These regulations will require many farmers to significantly change the way they operate and manage their farms. Some will have to purchase new, expensive equipment to apply commercial fertilizer rather than manure. Implementing these regulations before farmers are able to comply will clearly put many out of business. The new proposal provides one extra year for farmers to reach full implementation, although all farmers will start the PMT implementation process this summer. Enacting the regulations before farmers could realistically be expected to comply was one of the biggest objections they had to earlier proposals.
- Assure agricultural producers that critical elements are available for implementation. For PMT implementation to be successful, key elements need to be in place. As implementation progresses, the state will analyze these elements, which include: markets to relocate additional manure; adequate infrastructure to handle and transport manure; and alternative uses and new technologies to begin to provide new outlets and markets for animal manures. If the analysis shows these elements aren't available, farmers could postpone advancing to the next level of management for one year, not forever. If these elements are not in place, however, our family farms will be at risk of going out of business. Therefore, the state intends to expand its investment in these areas to ensure, as much as possible, that these elements are in place. It is in everyone's best interest that we succeed.
- Enact an immediate ban of additional phosphorus on soils highest in phosphorus. Upon adoption of the regulations, farmers with fields very high in phosphorus (i.e., those with a soil Fertility Index Value of 500 or greater) will be immediately banned from applying any phosphorus. These are the fields where phosphorus is most likely to leave the farm and enter nearby waterways. We estimate this will impact about 20 percent of the farm acres on the lower Eastern Shore. This provision provides an immediate benefit that goes beyond the original proposal.

- Provide comprehensive information on soil phosphorus conditions statewide. Every farm in Maryland that earns more than $2,500 or manages 8,000 pounds of animal weight must, by law, submit and follow a nutrient management plan. Beginning in September and every six years thereafter, soil test phosphorus data will be collected for all farms subject to nutrient management plan requirements. This will provide us with accurate soil fertility data, by county, so we can monitor trends in phosphorus levels and better identify where newly available manure may be spread.

In addition to these enhancements, the Agriculture Phosphorus Initiative includes an on-farm economic impact study. While Salisbury University conducted an economic analysis last fall, we don't have real on-farm data about the economic impact of the PMT. That is why we will launch an on-farm economic analysis project this spring. MDA will recruit 10 to 12 farmers to evaluate the economic impacts of implementing the PMT on a minimum of 1,000 acres. The data will help us determine what other resources we need to effectively and fully implement the PMT statewide. Governor Hogan has committed funding to help offset those economic impacts and to share costs of environmental improvements.

Finally, it is important to point out that it took many decades for phosphorus to reach the high levels we see today. More importantly, the early returns from the latest Bay Model Progress Report show that the Department of Agriculture has achieved its 2017 target goal for phosphorus. The PMT is in no way a compromise but reflects a national body of science's best understanding of assessing risk of phosphorus loss to our rivers and streams. Maryland farmers have always embraced science-based policy, and our Agriculture Phosphorus Initiative emphasizes that Maryland farmers are committed to restoring our treasured Chesapeake Bay.

Joe Bartenfelder is secretary of the Maryland Department of Agriculture. His email is joe.bartenfelder@maryland.gov.

PENN STATE AGRONOMY GUIDE 2015 – 2016

The Penn State Agronomy Guide is a comprehensive publication on crop and soil management and pest management for farms of all sizes. Here is the link: *http://extension.psu.edu/agronomy-guide*

2015 COMMERCIAL SMALL FRUITS GUIDE

This link will take you to this great publication: http://pubs.ext.vt.edu/456/456-017/Section-2_Commercial_Small_Fruit-1.pdf

2015 HOME ORCHARDS GUIDE

The latest version of this publication is here: http://pubs.ext.vt.edu/456/456-018/Section_3_Home_Fruit-Disease_and_Insects-1.pdf

TIPS TO REDUCE PLANTER PERFORMANCE EFFECTS ON CORN YIELD

Greg La Barge
Extension Agent, Ohio State University Extension

Dr. Peter Thomison
Extension Specialist, Corn Production

We ask a lot of planters in seed placement. When planting 28,000 seeds per acre at four miles per hour, 1.6 seeds are dropped by each meter unit every second. Increasing speed to six m.p.h. results in 2.3 seeds delivered every second. Thus, minor planter wear can cause seed depth and distance placement variability to increase, potentially impacting yield.

Plant Space Variability

A properly adjusted planter can singulate and uniformly space seed delivered from a planter to obtain a "picket fence" stand. Even stands reduce plant-to-plant competition and take best advantage of sunlight to make grain. Doubles or triples and large gaps can result in lost yield potential. Indiana research indicates that a *one-inch* increase in standard deviation of plant spacing results in yield losses up to 2.5 bushels per acre. A 1987 to 1996 study of stand observations from 354 corn fields in Ohio and Indiana found that 84% of the fields had a standard deviation in plant-to-plant spacing of more than 4 inches, which translated into potential yield losses of 5 to 12.5 bushels per acre.

Illinois research concluded that skips contribute to the standard deviation or plant-to-plant variability slightly more than doubles. They further concluded that skips reduce yield in fields where the intended population is at or below the optimum, while doubles increase yield when populations are less than optimum.

Three key points for farmers from this research are:

- An adequate plant population should be selected.
- Plant-to-plant spacing variability may not always result in yield loss.
- Skips limit yield more than doubles.

Method to Evaluate Plant Space Variability

The friendliest method to determine planter spacing performance is by measuring the distance between plants in the field. Measuring seed-to-seed distances is actually a better measure of the actual seed drop. Yet we can adjust the interpretation of the plant-to-plant measures to account for seed germination of less than 100%.

Getting plant space variability is a two-step process:

- Measure the distance between plants in a planter row by laying out a tape measure and recording the position of 30 plants along the tape measure to the nearest half-inch (example: 0, 6.5, 12, 18, 26...). Do this for each row of the planter unit at two locations in the field.
- The data can be entered into a spreadsheet program where the standard deviation, plant population, and number of gaps or doubles can be determined.

What is a standard deviation and what does it tell you?

Think of a standard deviation as how close plants are to the average spacing. Figure 1 shows results from two planters with identical average spacing of 7 inches but very different distributions of plant spacing. Each plant with Planter 1 is exactly 7 inches apart, resulting in a standard deviation of 0. Planter 2 has an average spacing of 7 inches but the standard deviation is 2 inches. Thus, a majority of plants are within plus or minus 2 inches of the average 7 inches or plant spacing is between 5 to 9 inches apart.

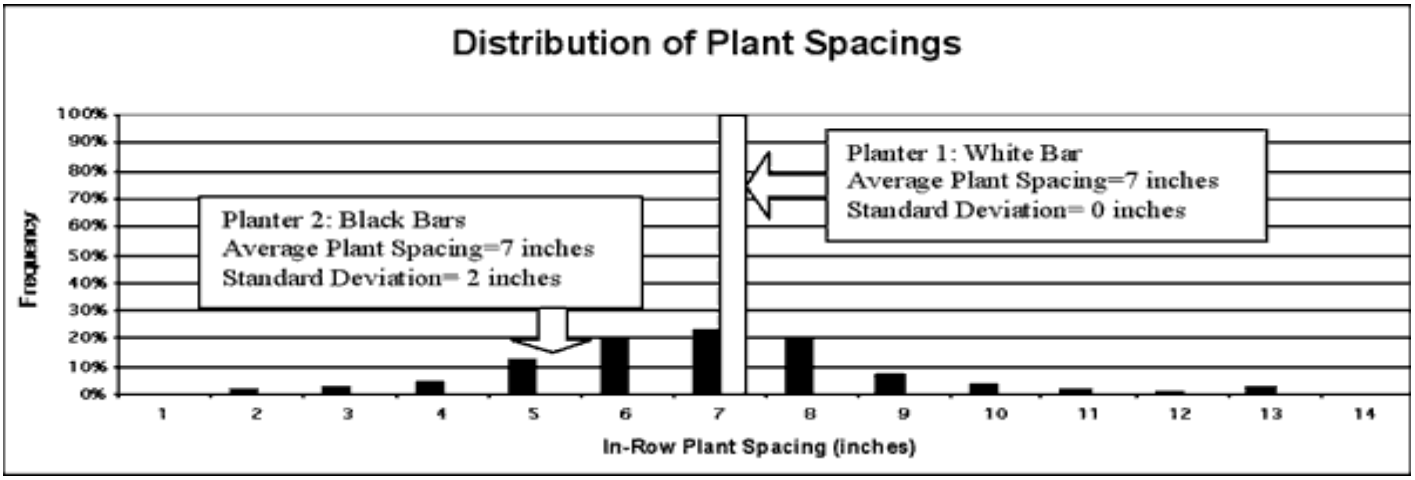


Figure 1. Illustration of two different standard deviations in plant spacing.

Targeted plant space variability is 2 inches (standard deviations) rather than zero, because plant spacing rather than seed spacing is being used. Seed germination in the 90 to 95% range will produce this type of variability

Tips to Reduce Plant Space Variability

- Read the planter's owners manual. Make adjustment checks and perform standard maintenance.
- Check finger pickups for wear on the back plate and brush.
- Check finger tension with a feeler gauge and set tension as recommended by the manufacturer.
- Check wear on double-disc openers and seed tubes.
- Check seed tubes for obstructions or kinks that can hold up seed delivery.
- Match plate and seed grades on plate planters.
- Make sure sprocket settings on the planter transmission are correct.
- Check for worn chains and stiff links. Lubricate chains plus grease fittings.
- Check to see that gears are lined up.
- Check tire pressure and wear.
- Check seed tubes for damage, wear, and burrs. Repair or replace.
- Clean tube sensors for planter monitors.

- Make sure the planter is level. An out-of-level planter has a seed delivery tube that is at a different angle than designed, and the seed is thrown back.
- Any time the operation of the planter causes the metering unit to jerk, variable seed placement will occur. Adjust all elements of planter operation for smooth performance.
- Observe and adjust planting speed to match ground conditions.

Not all university studies have reported major yield losses with unevenly spaced corn. Some have indicated loss only when the spacing variability is extreme and growing conditions are stressful. Moreover research indicates that uneven emergence has a greater adverse effect on yield than uneven spacing.

Plant Emergence Variability

Uneven emergence affects crop performance because competition from larger early-emerging plants decreases the yield from smaller later-emerging plants. The primary causes of delayed seedling emergence in corn include soil moisture variability within the seed depth zone, poor seed-to-soil contact resulting from cloddy soils, inability of no-till coulters to slice cleanly through surface residues, worn disc openers, and maladjusted closing wheels. Other causes include soil temperature variability within the seed zone, soil crusting prior to emergence, occurrence of certain types of herbicide injury, and variable insect and/or soilborne disease pressure.

Based on research at the University of Illinois and the University of Wisconsin, if the delay in emergence is less than two weeks, replanting increases yields less than 5 percent, regardless of the pattern of unevenness. However, if one-half or more of the plants in the stand emerge three weeks late or later, then replanting may increase yields up to 10 percent. Emergence delays of 10 days or more usually translate to growth stage differences of two leaves or greater. Therefore, if two plants differ by two leaves or more, the younger, smaller plant is more likely to be barren or produce nubbins.

Seed will germinate over a wide range of soil moisture conditions. Enough moisture must be available to swell the seed, triggering utilization of starch in the kernel. The optimum temperature for germination and emergence is 68F to 72F. Emergence occurs in five to six days at these temperatures. Soil temperatures below 50F dramatically slow germination and emergence. Individual seeds in a furrow may be subject to different temperature and moisture conditions due to placement.

The recommended depth of planting is 1.5 to 2 inches for most conditions in Ohio. When dry soils are a concern, 2.5 inch planting depth is suggested. When planting into dry soil, differential emergence often occurs, leading to "tall corn-short corn." Seed furrows should be checked to make sure seeds come into contact with moist soil. Ultimate seeding depth should be determined in the field, based on soil conditions.

Determining Seed Placement in the Field

Growers can diagnose seed placement problems by digging up and observing the mesocotyl length after emergence as shown in Figure 2. Since the plant develops crown roots at about 0.75 inches deep (when seeding depth is 1.5 inches or more), measure the length of the mesocotyl from the crown to the seed and add 0.75 of an inch to determine seed placement. Common causes of uneven plant emergence are soil moisture and temperature variability within the seed zone.

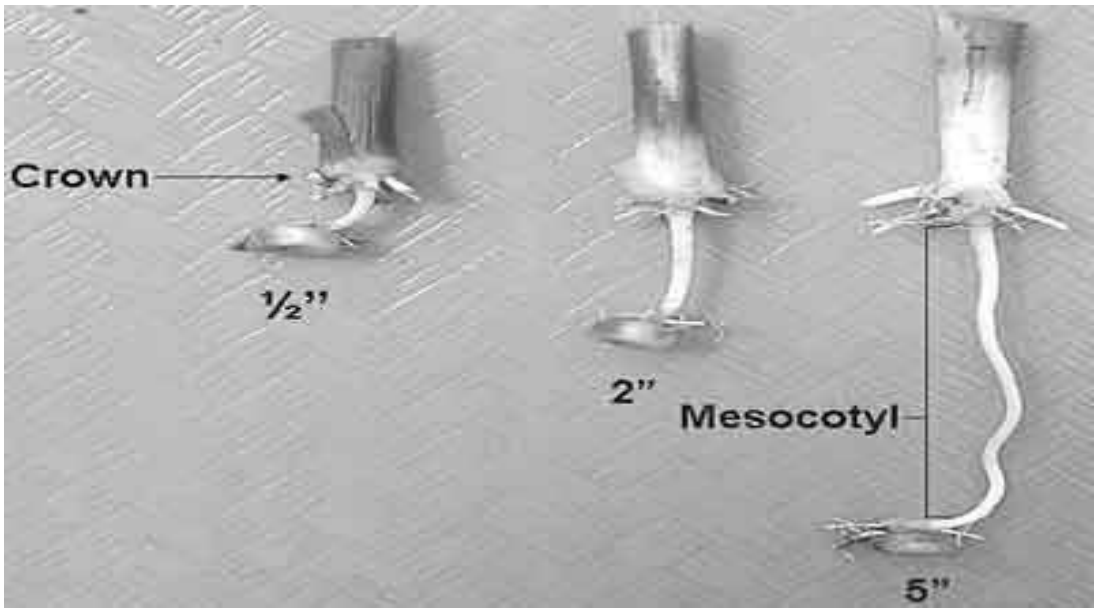


Figure 2. Crown roots develop at nearly the same depth although seeds were planted at 0.5, 2, and 5 inches deep. Corn mesocotyl elongation adjusts for varying seeding depths.

Tips to Reduce Emergence Variability

- Check to see that planter adjustments are accurate and the depth setting matches actual performance.
- Make sure the rocker arm assembly is properly lubricated and operating, if your planter has one.
- Make sure the planter is operating level. If too much down pressure is used to insert worn coulters in the ground, the planter will operate out of level. Seeding depth will be changed, and the seed tube will not deliver the seed into the furrow at the proper angle.
- Worn double disk openers can move apart at the bottom of the furrow and slice a "W" instead of a "V" shape, placing the seed higher in the furrow and leaving air around the seed.
- Use a seed firmer to assure the seed is placed in the bottom of the furrow and not hung up on the sidewall.
- Operate coulters at the same or slightly higher depth than the double disk or the seed placement will be at the coulter depth, not the disk opener depth.
- Use only the amount of down pressure needed to place the seed at the depth desired. Adjust tension so that depth control is met and back off one notch.
- Make sure gauge wheels are tight to the disk opener or a small mound of loose soil is formed that can fall into the furrow in front of the seed and affect depth of planting.
- Observe and adjust planting speed to match ground conditions.

Planter Speed of Operation

Planter speed of operation has received considerable attention in recent years. It has the potential to affect both seed placement and seed spacing. Some studies evaluating planter speed of operation show it can be an important factor in seed placement, while others show little effect.

A Purdue study with planters operated at speeds of 4 to 7 m.p.h. showed faster planter operation increased seed placement variability in 10 out of 22 sites. Yet this observed variability resulted in yield decreases at only five of the 10 sites. Yield decreases ranged from 1.9 to 4.7 bushels per acre per m.p.h. speed increase. A 1998-99 study from Wisconsin showed yield reduction of 7 bushels per acre when operating a planter at 8 m.p.h. vs. 4 m.p.h., or about 1.8 bushels per m.p.h. In a recent Illinois study, planter speeds of up to 8 m.p.h. had no effect on yield.

The fact that a yield response was detected at only five of 22 sites in the Purdue study would indicate that properly adjusting and maintaining the planter can reduce the impact of planting speed. It could also be suspected that speed effects would increase with rough ground conditions in a no-till field or cloddy seedbed. When the planter units are operating under conditions that cause the units to bounce, depth placement problems can result.

Planting speed should be based on the farmer's knowledge of equipment operation, soil conditions, and the actual operation of the planter. Planting speed needs to be a balance between seed placement issues and planting timeliness. Farmers may want to establish their own strip trials under common ground conditions operating at different speeds to get a better feel for their situation.

Summary

Determining the cause of an uneven stand is an important step in correcting variable emergence or plant stand problems. Cultural practices that promote uniform plant establishment will maximize grain production. Uneven corn emergence will generally have a greater impact on yield than uneven plant spacing.

Sources

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2015 SPRAY BULLETIN FOR COMMERCIAL TREE FRUIT GROWERS

The 2015 Spray Bulletin for Commercial Tree Fruit Growers is now posted at the same URL as last year:
http://pubs.ext.vt.edu/456/456-419/456-419-PDF.pdf

GLYPHOSATE RESOURCES
HEALTH AND CANCER ALLEGATIONS

With the blogosphere abuzz with glyphosate being classified as a "probable human carcinogen" by the International Agency for Research on Cancer (IARC), I thought it important to provide you with a broader perspective on the issue. The IARC is a European based private working group that is affiliated with the World Health Organization. The IARC conducts a limited data review, which is different than the comprehensive database review that public health authorities undertake. The conclusion reached by IARC is inconsistent with the reviews conducted by regulatory and scientific agencies around the globe for more than 40 years, and not supported by all scientific data. IARC did not consider new research or data and most importantly, many relevant studies were disregarded. It is our position that the conclusions and classification made by the IARC do not reflect the broad consensus of researchers who have concluded that there is no evidence that glyphosate causes cancer (see links below). We believe conclusions about a matter as important as human safety must be non-biased, thorough and based on science that adheres to internationally recognized standards. We support the rigorous process used by regulatory authorities in developed countries to consider all available data, published and unpublished, in a comprehensive evaluation. I appreciate your taking the time to understand all sides of this issue. I have attached a file with additional resources so please let me know if you have questions or concerns.

- GMO Answers.com, Does glyphosate cause cancer? http://gmoanswers.com/ask/does-glyphosate-cause-cancer
- Monsanto.com FAQ: Does glyphosate cause cancer? http://www.monsanto.com/glyphosate/pages/glyphosate-frequently-asked-questions.aspx#seven
- Discover.com, Link between glyphosate and cancer? http://discover.monsanto.com/conversation/question/are-you-ready-to-be-held-accountable-for-the-many-diseases-which-are-caused-by-your-poison-such-as-leaky-gut-syndrome-and-cancer
- Glyphosate Facts (Industry Task Force on Glyphosate), Is there evidence to suggest that glyphosate can cause cancer? http://www.glyphosate.eu/faq

PLANT POPULATIONS AND SEEDING RATES FOR SOYBEANS

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Purdue Extension

Crop, Soil, and Environmental Sciences Seed is one of the most expensive input costs for soybean growers, so it's important for growers to plant the right amount of seed to minimize input costs and increase profitability. Seeding rate, plant population, and row spacing are tied together. If the population is too high, plants

compete with each other and often lodge. If the population is too low, a producer is wasting growing space and lowering yield.
This publication examines the relationship between soybean seeding rate and plant population, describes how to determine the right seeding rates for optimal plant populations, and recommends seeding rates and plant populations for various crop row widths.

Physiological Response to Plant Population
High plant populations can have some advantages: canopy closure is quicker, light interception is greater, and weed competition is lower. However, yield does not always increase as plant population increases. As the number of plants per acre increases, each plant captures less light, which limits each plant's growth. High plant populations also increase competition for nutrients and water, may promote lodging, and add to seed costs.
Soybean plants are adaptable. When plant populations are low, individual soybean plants increase their leaf areas — which allows each plant to capture more sunlight — and produce more branches — which allows each plant to produce more pods. This characteristic (called plasticity) means that low soybean plant populations can offer competitive yields.

Determining Optimum Seeding Rate
Many factors influence plant population and seeding rate, including row spacing, seed placement and planter calibration, and the seed's germination rate. Seeding rate, plant population, and row spacing are closely related. As row spacing increases, the optimal number of plants per acre decreases.

Purdue Extension recommends row spacing between 7.5 and 15 inches for maximum soybean yield. Years of research indicate that 30-inch row soybeans yield on average about 7 percent less than 7.5- or 15-inch row soybeans (Hanna et al., 2007; Oplinger and Philbrook, 1992). The advantages of planting soybean in 15- or 30-inch rows are uniform seed placement, more uniform emergence, and decreased seeding rates, which means lower seed costs (Table 1).

A common practice among growers who reduce their seeding rates is to select a bush-type soybean. Our research indicates that there is no yield difference between erect and bushy soybeans planted in 7.5-inch rows even at low stand populations (about 50,000 plants per acre).
Seed placement is another important factor. Seeds should be planted between 0.75 and 1.5 inches deep, depending on soil type and tillage. Seeds can be planted shallower in heavy soils, such as high-clay soils. Uniform seed placement promotes uniform emergence, which is better than staggered emergence that can result in plant-to plant competition. Growers should always follow their drill or planter instructions to make sure they are correctly calibrated and functioning properly to meter seed at desired rates and establish a uniform stand. For more information, see Purdue Extension publication ABE-126-W, *Grain Drill Metering Systems and the Need for Calibration*, www.ces.purdue.edu/extmedia/ABE/ABE-126-W.pdf.

The seed itself also plays a role in determining seeding rate. Growers must consider the percent of pure seed a bag contains, the germination percentage, the percent of live seed emergence, and the desired plant population. Remember, seed companies test germination rates under ideal temperature and moisture conditions, so (depending on the situation) growers may plant 10 to 15 percent more soybean seeds than called for by the germination rate.

To calculate a seeding rate, use the following equation:

$$\text{Desired Plant Population} = \text{Seeding Rate}$$
$$\text{Percent Germination} \times \text{Percent Pure Seed} \times \text{Percent Live Seed Emergence}$$

Growers can use this equation with any unit — acre, square yard, square foot — as long as the same unit is used in both seeding rate and desired plant population.

For example, let's say a grower wants to establish a stand of 170,000 plants per acre using a 7.5-inch row drill. The seed tag indicates that the seed has a 92 percent germination rate and is 98 percent pure live seed. Assuming a 10 percent loss in germination due to a clay soil that crusts, what seeding rate will achieve the goal stand?

$$\frac{\textbf{170,000 plants per acre (Desired Plant Population)}}{0.92 \text{ (Percent Germination)} \times 0.98 \text{ (Percent Pure Seed)} \times \text{(Seeding Rate)}} = 209{,}505 \text{ seeds per acre}$$
$$0.90 \text{ (Percent Live Seed Emergence)}$$

When deciding the amount of soybean to seed, growers may need to consider other conditions on a field-to-field basis. These conditions include the type, texture, and moisture of the soil; weather patterns; pathogen and insect pressure; previous tillage practices; crop rotation; planter settings; planting dates; and seed treatments. Biotic and abiotic stresses in the field can reduce germination rates compared to rates measured in seed-testing labs.

Current Practices

Currently, Indiana growers plant approximately (Conley, S.P. and J.B. Santini, 2007):

- 197,000 seeds per acre in rows spaced 10 inches or less
- 178,000 seeds per acre in rows spaced 11 to 20 inches
- 154,000 seeds per acre in rows spaced 21 inches or more

Based on its research, Purdue Extension recommends seeding rates of (assuming 90 percent germination and 90 percent emergence):

- 210,025 seeds per acre for rows spaced 7 inches
- 163,350 seeds per acre for rows spaced 11 to 20 inches
- 130,675 seeds per acre for rows spaced 21 inches or more (see Table 1)

Today, 67 percent of Indiana growers plant soybean one to three weeks earlier than they did 10 years ago. This earlier planting can reduce stands in cold or wet years. In these situations using a fungicide seed treatment may prove beneficial. To maximize yields in most environments growers should have no less than 100,000 uniformly standing plants per acre in 7.5- and 15-inch rows and no less than 80,000 uniformly standing plants per acre in 30-inch rows.

Table 1. *Recommended Seeding Rates and Plant Populations at Different Row Widths*

Row Width (inches)	Required Seeding Rate at 90% Germination and 90% Emergence (seeds/foot)	Recommended Seeding Rate at 90% Germination and 90% Emergence (seeds/acre)	Recommended Plant Population (plants/foot)	Recommended Plant Population (plants/acre)
30	7.4	130,675	6.0	104,540
20	6.2	163,350	5.0	130,680
18	5.6	163,350	4.5	130,680
16	5.0	163,350	4.0	130,680
14	4.3	163,350	3.5	130,680
12	3.7	163,350	3.0	130,680
10	3.4	179,688	2.8	143,750
8	3.1	204,188	2.5	163,350
7	2.8	210,025	2.2	168,020
6	2.5	217,800	2.0	174,240

To maximize yield and reduce input costs, soybean growers need to pay attention to plant populations and seeding rates. These recommendations present the optimal seeding rates and plant populations for Indiana growers and following them may reduce input costs and improve profitability.

References

Conley, S. P.; Santini J.B. 2007. Crop Management Practices in Indiana Soybean Production Systems. Online. *Crop Management*. doi:10.1094/CM-2007-0104-01-RS.

Hanna, S., Conley, S. P., Shaner, G., and Santini, J. 2007. Impact of Fungicide Application Timing and Crop Row Spacing on Soybean Canopy Penetration and Grain Yield. *Agronomy Journal.* In review.

Oplinger, E.S. and B.D. Philbrook. 1992. Soybean planting date, row width, and seeding rate response in three tillage systems. J. *Prod. Agric.* 5:94-99.

INTRODUCTION TO FARRIERY

May 15, 2015
3:30 p.m. – 7:00 p.m.
Baltimore County Ag Center
Cockeysville, MD

Through a combination of lecture and demonstration, casual horse enthusiasts and professionals alike will gain a better understanding of hoof care and management. The program will begin with a lecture covering anatomy and physiology of the hoof, how hoof health and function is affected by conformation, skills associated with trimming the balanced foot, and when shoes are necessary. Dinner will be provided, followed by a demonstration of the trimming and shoeing process on a live horse with ample time for questions. Instruction will be provided by Chris Diehl, Certified Journeyman Farrier. Anyone is welcome to register; no experience is necessary. The program will be geared toward adults but may be suitable for older youth. The workshop is limited to 20 seats on a first-come, first-served basis; the deadline to register is May 12. Registration is $30 per person and includes all program materials and dinner. Participants may register online at www.introtofarriery.eventbrite.com (additional processing fees apply) or by calling the Harford County Extension Office at 410-638-3255 and paying by check. If you require special assistance to attend this program, please contact the Harford County Extension Office by May 1. For more details about the program, call the Harford County Extension Office at 410-638-3255 or e-mail Sara at sbh@umd.edu.

DATES TO REMEMBER

May 12 **Managing Risk for Food Businesses-**9:15 to 3:30 pm-The Maryland Agriculture Resource Center, 1114 Shawan Road, Cockeysville, Maryland 21030, please register by going to: http://managingriskforfoodbusinesses.eventbrite.com

May 15 **Introduction To Farriery**-3:30 to 7 pm-Baltimore County Ag Center, Cockeysville, MD, Participants may register online at www.introtofarriery.eventbrite.com

June 4	**Agribusiness Breakfast**-An Overview of a Large Dairy Operation by Matt Hoff, 8 to 9 am, Baughers Restaurant, Westminster, MD, Must pre-register at 410-386-2760 to attend.
December 13-16	**6th National Conference on Grazing Lands**, Grapevine, TX. For more information, please contact: John W. Peterson, 6NCGL Conference Manager at (703) 455-4387 (w), (703) 505-1782 (c) 703-455-6888 (f) or jwpeterson@cox.net

Visit our web site at http://extension.umd.edu/carroll-county

For more event listings visit
http://www.agnr.umd.edu/AGNRCalendar/

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If you would like to be removed from our mailing list, please call: 410-386-2760 or 1-888-326-9645.

If you have a disability that requires special assistance for your participation in a program please contact the Carroll County Extension Office at 410-386-2760, Fax: 410-876-0132, two weeks prior to the program.

Do you own a food business and . . .

- worry about the safety of farm-fresh vegetables and fruits you sell?
- wonder about what might happen if you need to recall your products?
- have questions about how to effectively notify customers about food allergens?
- want to protect personal and business assets through correct insurance coverage?
- desire a way to **ensure** batch consistency and safety?

If so, *Managing Risk for Food Businesses* will teach you the strategies and tools to handle business liabilities!

Material included in this course is based upon work supported by USDA/NIFA under Award Number 2010-49200-06201.

USDA NIFA United States Department of Agriculture National Institute of Food and Agriculture

This project supported [in part] by the Northeast Sustainable Agriculture Research and Education (SARE) program. SARE is a program of the National Institute of Food and Agriculture, U.S. Department of Agriculture."

NORTHEAST SARE Sustainable Agriculture Research & Education

Penn State College of Agricultural Sciences research and extension programs are funded in part by Pennsylvania counties, the Commonwealth of Pennsylvania, and the U. S. Department of Agriculture.

Visit Penn State Extension on the web: **extension.psu.edu**

Penn State encourages persons with disabilities to participate in its programs and activities. If you anticipate needing any type of accommodation or have questions about the physical access provided, please contact Winifred McGee at 717-270-4391 in advance of your participation or visit.

This publication is available in alternative media on request.

Penn State **Extension**

Managing Risk for Food Businesses

Date: May 12, 2015

Location:
Maryland Agriculture Resource Center
1114 Shawan Road
Cockeysville, MD 21030

Time: 9:15 AM - 3:30 PM

PENNSTATE Cooperative Extension
College of Agricultural Sciences

American consumers are more aware, today, of the need for assurance that food was grown and processed in a safe manner. Research shows that those who buy locally grown or processed foods do so because they trust the effectiveness of our country's food safety regulations and ***they believe that a food producer/seller will not look them in the eye and sell them something that will be harmful their family to eat.***

As a result, food venture owners, including farmers who sell directly to the public, need to consider and adopt the appropriate tactics to lessen the liability associated with their specific products.

Cooperative Extension's ***Managing Risk for Food Businesses*** takes you step by step from the field to the table, exploring key strategies and tools to respond to the risks associated with a product that the consumer ingests. Although appropriate for any food business owners who want to proactively address the liabilities of food sold to the public, the workshop is especially directed to individuals who will be making and packing their products for resale (through grocery stores, open-air markets, or restaurants).

The January 2011 FDA Food Safety Modernization Act (FSMA), was designed to ensure that the U.S. food supply is as safe as possible. Its application to all sizes of food businesses and a variety of products increases the urgency for every food business owner to understand how he or she can lessen business liability.

This workshop offers a combination of educational presentations, panel discussions with successful food entrepreneurs, and a highly interactive learning environment, to address if new practices are required, as well as voluntary ways to proactively address the business risks that come with selling food to the public. Included in the discussion are:

- Good Agricultural Practices (GAP)/ Good Handling Practices- procedures that farm-fresh producers and packers follow, to ensure food safety of their product.
- Hazard Analysis Critical Control Point (HACCP) Planning– Identifying and monitoring process steps to reduce food product related hazards for enhanced food safety.
- Liability Insurance– Case studies of those well and poorly insured, showing the types/levels of coverage needed.
- Allergen Warnings– Complying with FDA food labeling regulations to create clear statements concerning product contents, identifying any proteins derived from the eight major allergenic foods.
- Proactive Recall Processes—Coding batches and keeping accurate records so that the entire product line need not be recalled in an emergency.

New regulations are often complicated; it is difficult to apply general rules to specific situations. By learning about the tactics to guard food safety, participants will be able to develop a business risk management strategy that is legally and ethically appropriate for their food ventures.

Registration Information

Because of USDA/RMA funds that support development and delivery of this workshop, your fee (including lunch and all handouts) is **$40.00, payable by credit card or personal check.**

To attend *Managing Risk for Food Businesses* in Cockeysville MD please register by going to:

http://managingriskforfoodbusinesses.eventbrite.com

DEADLINE to Register is May 4, 2015 (or when the class is filled)

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This workshop is co-sponsored by **University of Maryland Extension, Maryland Rural Enterprise Development Center, and Ag Marketing Program**

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