

The University of Maryland Extension Agriculture and Food Systems and Environment and Natural Resources Focus Teams proudly present this publication for commercial agronomic field crops and livestock industries.

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Agronomic Crop Insect Update

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Alfalfa and Grass Hay Crops

Be sure to watch for defoliators in grass hay crops and alfalfa. Significant damage can occur in grass hay fields from true armyworm and fall armyworm. It is important to catch populations before significant damage has occurred and when larvae are small. In addition to checking labels for rates, be sure to check for all restrictions including, but not limited to, comments on control under high populations and size of larvae; days to harvest and forage/silage restrictions. No thresholds are available; however, controls should be applied before significant defoliation occurs.

Field Corn

In the past couple of years, we have received calls about aphids in field corn by mid-August. In most cases, populations have been spotty within fields or are only found on field edges. Currently, there are no treatment thresholds for aphids in corn past tasseling. In many cases, fields have been beyond the point of considering a treatment due to the maturity of the crop and the presence of beneficial insects and/or parasitized and diseased aphids.

Although we have no thresholds for aphids in corn in our area, here are some considerations developed by entomologist in the Midwest that can help to make a treatment decision:

1. Are 80 percent of the plants infested with aphids?
2. Do most of the ears have aphids? What about the ear leaf and above?
3. How long has the field been infested and is the density increasing?
4. Do you see honeydew or sooty mold on the stalk, leaves or ear?
5. Are you seeing winged aphids or nymphs with wing pads? That may be a sign of migration out of the field.

6. Is the field under drought stress?
7. Do you see any bloated, off-color aphids? Natural fungi can quickly wipe out aphids. In addition, are beneficial insects/parasitized aphids present?
8. What is the corn growth stage? Fields reaching hard dent should be past the point of justifying a treatment.
9. Some insecticides have a long pre-harvest interval so be sure to check the label.

Soybeans

We continue to find low levels of defoliators (Japanese beetles, grasshoppers, silver spotted skipper, green cloverworm and isolated spots of fall armyworm and yellow striped armyworm) in both full season and double crop soybeans. As a general guideline, treatment decisions for defoliators should be based on the following defoliation thresholds:

- (a) Full Season Plantings – 30% defoliation pre-bloom; 15% defoliation from bloom through the end of pod fill; 35% – once fully developed seeds are present
- (b) Double Crop Plantings (especially if growth is poor) – 20% defoliation pre-bloom, 10% defoliation from bloom through pod fill; 15% defoliation – once fully developed seeds are present.

Another defoliator that is showing up earlier in states to our south is the soybean looper. This insect is a migratory pest and in past years we have seen it cause significant defoliation in outbreak years. It is often a problem in dry years. Since resistance to pyrethroids has been documented in states to our south, a non-pyrethroid option will need to be selected if they become a problem. We also have other looper species in our fields so proper identification is important. The following link from Virginia includes pictures to help with identification:

<http://blogs.ext.vt.edu/ag-pest-advisory/soybean-loopers-are-infesting-soybeans-in-north-carolina/>

In drought stressed areas of the state, we can find spider mites on field edges and within fields. Be sure to watch for hot spots of activity in field interiors. Early detection and control is needed for spider mite management.

Continue to watch for an increase in stink bug populations. Economic damage from stink bugs is most likely to occur during the pod development and pod fill stages. Brown Marmorated stink bug populations still remain extremely low and are only being found along field edges that border woods in New Castle County.

We continue to survey for Kudzu Bug but have not found any in soybeans or kudzu. In Virginia, kudzu bugs have been found in soybean fields in 21 southern/eastern counties but in all cases, these have been adults only, and at very low numbers: http://blogs.ext.vt.edu/ag-pest-advisory/files/2015/07/KB_map_30_July_2015.pdf Be sure to scout soybeans for this insect and follow the Kudzu Bug website – www.kudzubug.org — for identification and treatment information. The treatment threshold is still one nymph per sweep.

We have also started to find an occasional soybean aphid in a few fields throughout the state. Cooler weather patterns favor an increase in populations. The economic threshold for soybean aphid established in the Midwest is 250 aphids per plant. Populations should be increasing and most of the plants should be infested (>80 percent) in order to justify an application. This threshold is appropriate until plants reach mid-seed set (R5.5). Spraying at full seed set (R6) has not produced a consistent yield response in the Mid-west. You should also consider beneficial insect activity before making a treatment decision. Most products labeled for soybean aphid will provide effective control

As far as corn earworm, we continue to find low levels of small larvae, mainly in double crop fields. The results of the annual corn earworm survey in field corn in Virginia, which has been used as an indicator of the potential for corn earworm in soybeans, indicates that statewide, approximately 17.5% of ears were infested with corn earworm. This is even lower than the numbers reported in 2014 (20%) and 2013 (18%):

http://blogs.ext.vt.edu/ag-pest-advisory/files/2015/07/CEW_survey_2015.pdf

However, our trap catches just spiked this past week, especially our pheromone trap catches, so it will be important to scout all fields for earworms in the next week to 10 days. In making a treatment decision, the use of the Corn Earworm Calculator – developed in VA and NC:

<http://www.ipm.vt.edu/cew/> will provide the best decision making information since it estimates a threshold based on the actual treatment cost and bushel value you enter.

IPM Threshold Guide

Agronomic Field Crops

ECONOMIC THRESHOLD –

Level of pest activity when control action is suggested to prevent economic injury

Available at:

<https://extension.umd.edu/sites/default/files/docs/IPMAgronomicCropsGuide2009.pdf>



IT'S AUGUST – ARE YOUR COVER CROPS GROWING YET?

Sarah Hirsh, Graduate Research Assistant

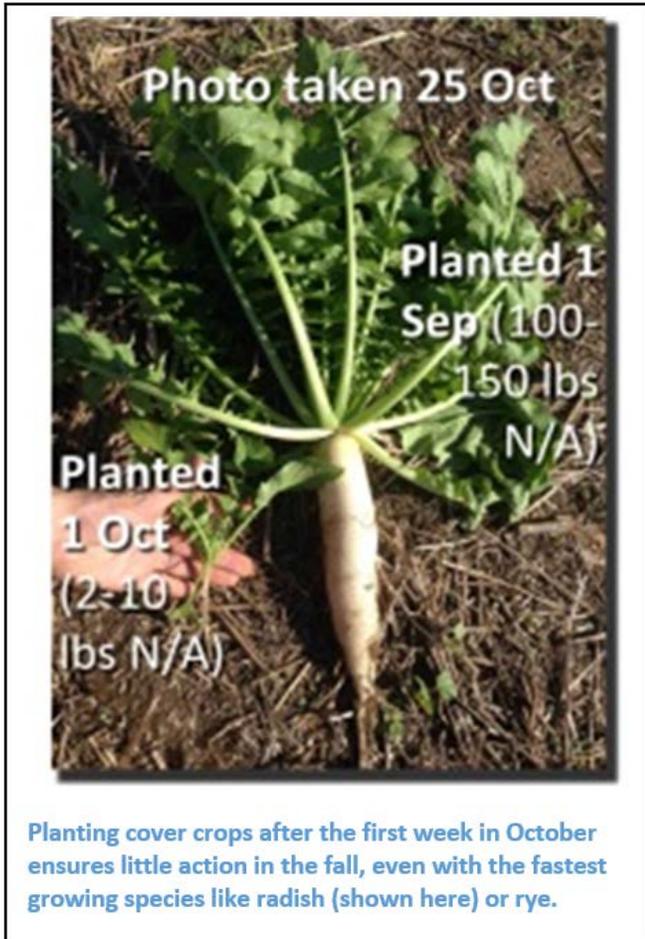
&

Ray Weil, Professor

Department of Environmental Science and Technology
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Most folks are thinking about vacation, or maybe harvest...not cover crop planting in August. But for cover crops to really pay, they need time to work in the fall...and that means planting in August – or at least by early September. Unless you are taking off corn silage, such early planting will probably mean planting cover crops *before* the cash crop is pulled from the field. Think air-seeding with Hi-boys or aerial seeding with aircraft as the crop senesces and dries down... or maybe do the air seeding right after side-dressing corn and really give the cover crop a head start. Other strategies include using extremely early maturing corn hybrids in some field to get a jump on cover crop planting and lock in high prices. While these strategies may not work in every field, and may not be for the faint of heart, they can pay off well.

Plant now, save later – save nitrogen, that is. Planting cover crops early can clean up nitrogen (N) left in the soil after summer crops and capture deep soil N, which would otherwise likely be leached away over the winter. If aggressive cover crops have an extra few weeks of warm long day length growing time in September they may pick up large quantities of nitrogen from 4 ft down - - or deeper -- before they shut down with winter weather. Our research group is finding more soluble soil nitrogen, even high-yielding corn crops, than you might expect.



Lots of folks assume that corn keeps taking up nitrogen from the soil pretty much right up to harvest. But in fact, during late August and September when corn is filling grain, the nitrogen for that grain is coming mainly from other parts of the corn plant. That's why the plant starts to yellow, generally beginning with the bottom leaves. During this 4 to 6 week period when the corn uptake of nitrogen has virtually ceased, but the crop isn't ready for harvest, soluble nitrogen remaining in the soil, and that still being released by microbial decay, is subject to being washed down with percolating rainwater. By the time the corn is finally harvested, much of this nitrogen maybe several feet deep. By the time traditional cover crops are maximizing growth in spring that nitrogen is long gone.

Soil samples taken by our research group down to 7 ft deep on 14 farms in late August to mid-September, 2014, indicated that *on average* of about 300 lbs/acre of mineral N remained in the soil profile after summer crops. Early planted cover crops we measured captured 50-250 lbs/acre of N *in the fall*. With rapid-decaying species, most of that nitrogen is released by the spring, and may contribute to increased yields, reduced fertilizer requirements, and reduced N loading from farms to the Bay. Because of the warmer temperatures and longer days, each day in August or early September is worth about **three or four days** in October, in terms of cover crop growth and nutrient capture (see photo).

In fall 2014 and spring 2015 we used a heavy isotope (¹⁵N) to trace nitrogen uptake by forage radish (*Raphanus sativus*) and rye (*Secale cereale*) cover crops. The heavy nitrogen isotope in the form of potassium nitrate was buried at 3.5 or 7 ft deep in late August, about the time that corn nitrogen uptake has nearly ceased. Cover crops were planted above the buried ¹⁵N. The presence of the heavier ¹⁵N could then be detected in the biomass of the cover crops using mass spectrometer technology. When the forage radish and rye were planted September 1, both species captured the buried N from 3.5 ft deep. However, when planted October 1, neither species captured any of the buried N.

The choice of cover crops species is important in order to capture N in the fall and *release* it in the spring. While rye and forage radish are both deep-rooted species, rye will hold onto (immobilize nutrients rather than release them in the spring. Forage radish winter kills and decomposes quickly, releasing its nutrients early – maybe too early. Cover crops that include several species can provide both spring ground-cover and release of nutrients in time to be used by cash crops. Including other species such as N-fixing legumes could add additional N to the system in spring.

In order to get the maximum benefits from cover crops, alternative approaches may be necessary to work them into the cropping rotation. Some crops are conducive to early-planted cover crops, such as corn silage, potatoes, or other vegetable crops. In addition, early season corn varieties could allow for earlier planting of cover crops. For later harvested corn crops, cover crops can be aerially seeded into standing corn in early August-early September. Similarly, cover crops can be seeded during late summer using a hi-boy air seeder with drop-down nozzles to ensure good seed distribution and soil contact. If you have irrigation, applying about 1/3 inch of water, after aerial seeding can greatly improve the stand and growth of these cover crops.

It is even possible to get fall cover crops started earlier. Interseeding into corn at N side-dress time has also worked well. Special Hi-boy style drills are being

developed for this purpose. Clover, radish and ryegrass are good species to try with interseeding. They won't grow enough to compete with the corn or interfere with harvest, but once the corn canopy opens up in late summer, the cover crops with tart to take off.

However you achieve it, the goal is to have your fields looking green the day after harvest and covered with 1 to 3 tons of high-nutrient dry matter *before* winter sets in.

Soybean Diseases are Present; Is Fungicide Application Warranted?

By Nathan Kleczewski
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Fungicide use in soybeans is a somewhat controversial subject in Delaware. Overall, Delaware soybeans do not suffer to a significant degree from fungal diseases such as white mold or even Frogeye leaf spot. More commonly, we see brown spot and downy mildew on our beans, especially this time of year. Why are these not typically diseases of concern in soybean production?

Downy Mildew

Downy mildew (DM) is a disease that prefers cooler temperatures and persistent humid conditions. On foliage, DM appears as small light green to yellow flecks when viewed from the top (Figure 1). When the leaf is turned over you will see white to grey fuzz under the location of the discolored lesions. Hot, dry weather stops this pathogen dead in its tracks. Often growers see a slight flush in downy mildew right around canopy closure. Then, the disease stops as temperatures increase and we hit summer full on. Downy mildew on soybeans is not a concern as it is in cucurbits. Don't worry about soybean DM.



Figure 1. Top view showing a leaflet with typical symptoms of downy mildew. When the leaf is flipped over, you will see white to grey fuzz immediately underneath the discolored spots.

Septoria Brown Spot

Septoria brown spot is a soybean-residue borne disease that also requires very persistent, wet conditions. This often means that the disease is restricted to the lower canopy, which is not contributing much to yields later in the season. Lesions often start as small black to brown spots with yellow halos. Over time the leaf will turn yellow and look as if someone splashed it with black paint (Figure 2). Most varieties are very tolerant to brown spot and the disease often has little to no impact on yield except if an extremely susceptible variety is planted. Defoliation upwards of 25% is required before any noticeable yield loss occurs. Rarely are fungicides needed to suppress Septoria brown spot.



Figure 2. Septoria brown spot is often restricted to the lower canopy. Small, black to brown lesions form on green tissue. Over time, the affected foliage may turn yellow and fall from the plant.

Frogeye Leaf Spot

Frogeye leaf spot is a big problem in the South and we have seen an occasional field with a fair amount of disease. Infection typically occurs after flowering and starts as small brown lesions that expand to form irregularly shaped, grey/tan blotches with purple/red margins. When flipped over, lesions will have a fuzzy grey mass at the center (Figure 3). Stems can also be infected, but this is much less frequent. The pathogen is much better at infecting young, developing foliage, so often plants appear to have "layers" of lesions in the canopy that correspond to periods of persistent wet weather during plant growth. If you do have significant (much more than a lesion here and there) levels of Frogeye in a field at R1, an application of a premix or triazole-based fungicide at R2/3 may provide some benefit if wet, humid conditions are likely to persist in the coming days or you plan on heavily irrigating your soybeans.

Agronomic Disease Update

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Webcast on Soybean Vein Necrosis Virus

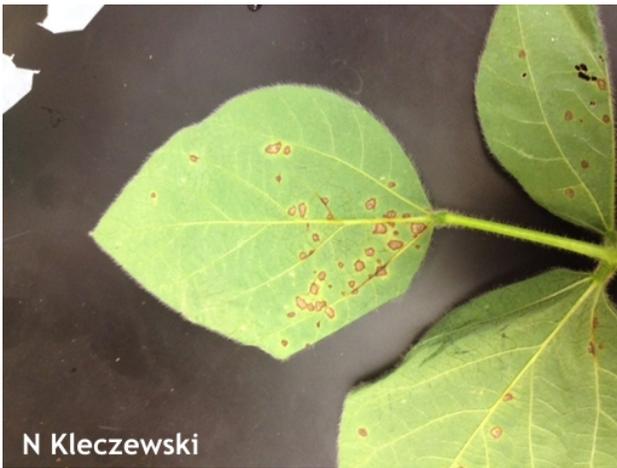
Soybean Vein Necrosis Virus is a relatively new virus on soybeans. Over the last two years, we have been conducting surveys in Delaware for this virus and have been collaborating with other plant pathologists to better understand the impacts of this virus on soybean productivity and quality. Damon Smith, my counterpart from Wisconsin, recently published a nice webcast on the Plant Management Network on some of our recent results. Follow this link (or enter into your browser) to access the video:

<http://www.plantmanagementnetwork.org/edcenter/seminars/soybean/SoybeanVeinNecrosisVirus/>

I also encourage you to sign up for a PMN account. PMN offers great plant pathology applied research updates, tutorials, and other materials valuable to growers, scouts, and industry professionals.

Ear Rots in Corn

Over the last two weeks we have started to hear about some issues with ear rots in some fields, in particular Diplodia and Fusarium ear rot. Ear rots can be caused by a number of different Fungi, and can impact grain quality and yield. Another potential issue resulting from some ear rots is the development of mycotoxins, which can be harmful to livestock and humans if consumed. In general, ear rots are derived from corn residue on the soil. The diseases tend to infect when we have wet weather from silking to about 2 weeks after the start of silking. Insect damage and delays in planting or slow grain drying or harvest can increase ear rot severity and incidence. The fungi often colonize the silks and then use the silk as a means to enter the developing ear although some (i.e. Diplodia) can also infect husks or the shank. Late season rains can increase ear mold severity and potential impacts on quality. **The best means to manage ear rots is to rotate corn with another crop such as soybeans or vegetables, select resistant hybrids (when available), and manage insects. Do not expect a fungicide to have much impact on ear rots.** Early harvest and drying to 15% moisture can limit additional fungal growth impacts on grain quality. To scout for ear rots inspect at least 10 ears for every 20 acres of field (minimum of 30 per field) prior to harvest. If you encounter ear rots at significant levels, send a sample to the Diagnostic Clinic to have it properly identified. Table 1. provides you a cheat sheet on some of the more common ear rots in corn.



N Kleczewski
Figure 3. The underside of a leaf with symptoms of Frogeye leaf spot. Note the purple margins and blotchy appearance. This can be confused with herbicide injury. Herbicide injury will be more uniform in a field when compared to plants suffering from Frogeye leaf spot.

Stem Canker

Some samples with symptoms characteristic of stem canker have arrived at the plant clinic over the past week. Stem canker is a fairly common disease in our region, particularly under persistent wet conditions like we have had over the previous few weeks. What does stem canker look like? Often you will notice areas of dead plants with dead or dying leaves in the field. The first symptoms of stem canker are small red/brown lesions on the bases of petioles or stems. Over time lesions expand to form corky, sunken, brown/red cankers that gradually expand the length of the stem.

Cankers girdle the stem, preventing movement of water and nutrients throughout the plant, eventually resulting in the death of plant parts above the canker. Leaves often develop interveinal necrosis due to a toxin produced by the fungus. Foliar symptoms are not a diagnostic feature of this disease. If you are lucky you may see small, black, pinhead-sized dots on the lesions. There is no within-season management after the disease has appeared, but the disease can be minimized in subsequent years by selecting a resistant variety, rotation to a non-host such as corn, using a balanced nutrient program, and managing residue where appropriate.



Figure 4. A soybean stem with symptoms of stem canker.

D Hershman, UKY

Table 1. Ear rots commonly encountered in corn.

Disease	Distinctive Symptom	Mycotoxins	Notes
Aspergillus ear rot	Stunting, small ears, powdery olive green growth in between kernels	Aflatoxin (carcinogen and toxin to liver)	Dry areas of field often affected more severely
Cladosporium ear rot	<ul style="list-style-type: none"> Dark, green/black blotched or streaked kernels. Scattered throughout ear. Green fuzzy growth between kernels. 	none	Often associated with insect damage
Diplodia ear rot	<ul style="list-style-type: none"> Straw colored husks, white/grey growth in between kernels 	none	Disease often progresses from base to tip of ear but entire ear can be
	premature germination.		
Fusarium ear rot	<ul style="list-style-type: none"> Kernels show a whitish "starburst" pattern Sometimes kernels have grey to pink "cap" Often scattered throughout ear 	Fumonisin	More severe when hot dry weather follows flowering.
Gibberella ear rot	<ul style="list-style-type: none"> Pink to red mold grows in between kernels. Typically only impacts part of ear 	Deoxynivalenol (DON) Zearalenone	Often starts at ear tip and works down to the base of the ear
Trichoderma ear rot	<ul style="list-style-type: none"> White mold that turns green/blue and powdery. Whole ear affected. 	none	More severe when wet weather precedes harvest. Often associated with mechanical damage to ear.

Residue Impacts on Stagonospora Glume Blotch in wheat

Wheat season is well behind us and another season is fast approaching. One issue some growers encountered this season was Stagonospora leaf and glume blotch, a common disease of Delaware and Maryland wheat fields. There appears to be a trend of increasing incidence and severity of Stagonospora and other members of the leaf blotch complex (tan spot, Septoria blotch) in many regions where wheat is grown. This is likely a result of increased no till or minimal till acres. The use of no-till results in more wheat residue, which is used by the leaf blotch pathogens as an overwintering nutrient source. As a result, there is a greater potential for leaf blotch diseases due to the larger amount of local and regional inoculum.

Although it is likely that residue levels are related to leaf blotch outbreaks, little information exists on the impacts of residue on disease severity and yield. In a recent publication in the journal *Phytopathology*, a group of researchers set out to better understand the role of residue on winter wheat disease severity. Experiments were conducted from 2012-2014 using the wheat varieties Dynagro Shirley and Dynagro 9012. Four to six levels of residue were added to experimental plots. Disease severity was measured over time and yield calculated. What did the researchers find? Glume blotch severity was associated with increasing residue levels. This was not a big surprise. However,

the studies indicated that disease severity increased in a non-linear fashion. In fact, disease increased rapidly with relatively small increases of residue when residue levels were low, but leveled out somewhat when residue levels increased above 20-30% surface coverage. Disease severity ranged from 0-50% but only impacted yield at two sites. These results indicate that reducing residue can significantly reduce the impacts of *Stagonospora glume blotch*, but in order to see real benefits residue needs to be reduced below 30% coverage of the soil surface.

Reference Mehra, L.K, C. Cowger, R. Weisz, and P. Ojumbo, 2015. Quantifying the effects of wheat residue on severity of *Stagonospora nodorum* blotch and yield in winter wheat. *Phytopathology*: <http://dx.doi.org/10.1094/PHYTO-03-15-0080-R>



Soils for Precision Agriculture

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Are you looking to sample soils for precision agriculture and variable rate applications? Considering the amount of samples you may have to take, this decision can be daunting. Rather than using one sample to describe the nutrient content of a field, you may be pulling twenty or more. Prior to performing a soils analysis you should understand the options available to you, take a good look at your operation and discuss options with your agronomic and nutrient management consultants.

Do I use grid or zone sampling?

There are two methods used to precision sample soils: grid sampling and management zones (Figure 1). Grid sampling is much more intense, with recommendations ranging from one sample per acre to every 2.5 acres. Consider this example: if you have a 40 acre field and sample on a 2 acre grid, you would collect a total of 20 soil samples. Each of these 20 samples could be a consolidated sample of five or more cores, giving you a

total of 100 samples with in that 40 acre field. Just considering the number of samples you have to collect may convince many producers to forget about it. Research shows that there are benefits to intensive sampling though. Grid sampling can reveal management issues with past manure or lime applications, uncovering hidden variation in the field (Figure 2). When performed at the correct scale, grid sampling will produce maps that can remain accurate for several years. This should alleviate the worry that you must create fresh grids every year. These maps can last 10 to 20 years for slowly changing landscape properties, like organic matter and cation exchange capacity. Nutrient content and pH will have shorter, but still significant life spans at 5 and 10 years, respectively. In Figure 2 you can not only observe the variability in P and K across a field, you can also see that P and K are higher in different parts of the field. While P is greatest in the lower left hand corner of the field, K is greater around the residential area. This is an example of what intensive sampling can uncover.

Nutrients may also control the scale of grid sampling. While the University of Nebraska recommends 1 sample per acre as optimum (with a maximum of 1 sample per 2.5 acres), a study in Brazil (Nanni et al, 2011) observed that 1 sample per 5 acres was adequate for organic matter ad clay. This study also noted that nutrients like P and K need a denser grid of one sample per 2 acres, similar to the University of Nebraska.

What are management zones?

Another soil sampling method, referred to as management zones (Figure 1), was devised to group similar yielding sections of a field together. Instead of intensive grid sampling, soils can be tested as a consolidated sample within each zone (high, medium, and low yield). Similar to using soil maps to group high and low yielding regions of a field, management zones can lower sampling density but may also lose sensitivity in detecting small field variations.

While there may be less physical labor involved, management zones will require increased mental labor. To separate out zones, soil and yield maps, farmer experience and aerial photos can be combined. The methods employed will take knowledge and experience to ensure the maps are accurate. Asking the right questions of your precision ag consultant are necessary to ensure you get what you pay for.

It is recommended that you have at least three years of yield data to cover seasonal variability and producer error. While weather may be a strong factor for annual yield, consistency in planting date, population and depth may also factor in. It's not just enough to have the yield data, you must also decide the best method to average several seasons together. For the highest yielding

regions of a field your maximum yield might be 200 bushels of corn in 2013, but only 150 and 180 in 2014 and 2015, respectively. Should you just average those yields together? Or can you normalize or standardize the data, creating a scale from zero to one for the field, with one being the highest yielding portion each year. Whatever choices you (or your consultant) make, they should be revisited and checked again in subsequent years. Whether performing grid or management zone sampling, you should analyze end of season results to be sure the cost is justified.

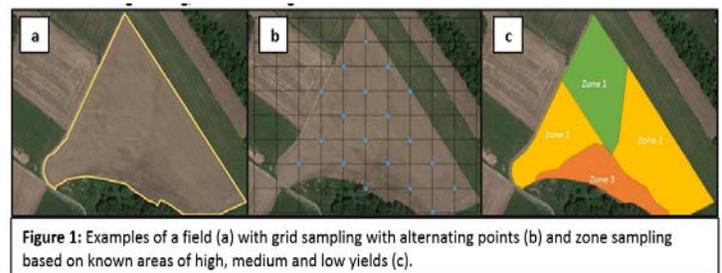
Does nutrient management affect my variable rate application?

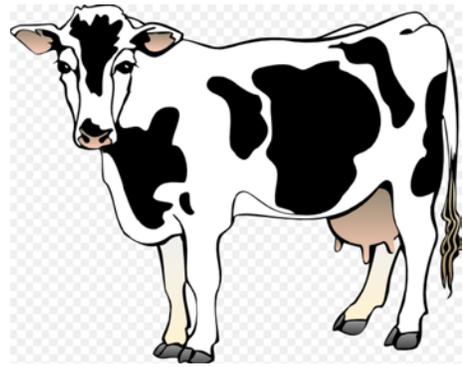
Another question you should ask prior to choosing a sampling method is: how does this fit with my nutrient management plan (Figure 3)? You should consult with your nutrient management advisor to be sure your precision ag plan meshes with your nutrient management plan (NMP). If you choose to have an NMP from a consolidated soil sample, your grid or zone maps cannot exceed the recommended rate. If you already know of zones/grids that require more nutrients, be sure to include those in your nutrient management plan. If the variability across a field is not that great, perhaps a consolidated sample will do. An example of nutrient application rates based on precision sampling can be seen in Figure 3. From the soil tests performed (Figure 2), a nutrient management advisor can give more accurate recommendations.

In Maryland new soil samples are only required every three years for an NMP, so it may be wise to split your farm into thirds, minimizing annual sampling. You should also be consistent with sampling depth across a field, being sure to sample the entire root zone, and not just the upper few inches. This will improve nutrient recommendations whether you use precision agriculture or not.

Where will we go in the future?

What the future holds for precision agriculture and soil sampling is hard to see. Grid and zone sampling will remain viable, but on the go sensors, whether attached to tractors or unmanned aerial vehicles, may increase accuracy and decrease the cost of soil sampling. It is a future which will require bright minds interested in engineering, science and agriculture.





Analyzing Your Income, Expenses, and Profit from Producing Milk

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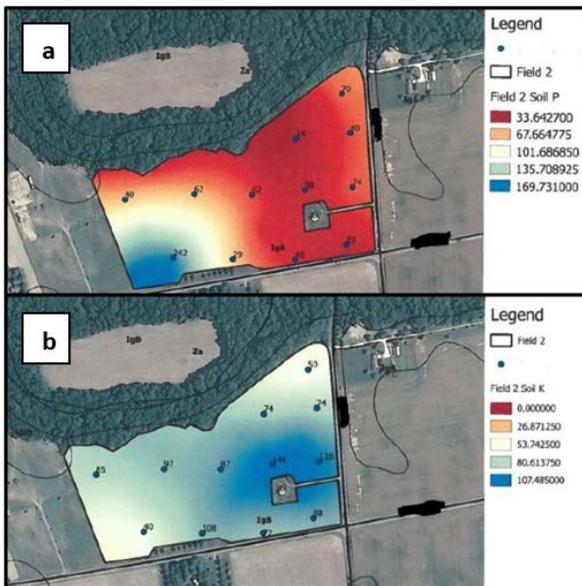


Figure 2: Variability of soil P (a) and soil K (b) levels across a field. Each point is a soil sample. Lowest concentrations in red and highest in blue.

What price are you getting for a hundred pounds of milk? If you are like most dairy farmers, you know the price or you can get it very quickly by reviewing milk check receipts. Do you know how much it costs you to produce a hundred pounds of milk? If you are like many dairy farmers, you may not know. Dairy farming is complex, and determining your costs of production is sometimes difficult. Yet, your costs directly affect your profit, and it is important to understand them.

We encourage dairy farm managers to calculate income and expenses on a per cwt. basis and a per cow basis. Putting your income and expenses on a per cwt. and per cow basis gives you a different perspective on your profit, enabling you to better analyze your efficiency. Comparing your total farm income and expenses with other farms tells you very little about efficiency because of differences in farm sizes, herd sizes, and yield levels. But you can make a direct comparison on a per cwt. and per cow basis. Each year since 1995, the University of Maryland Extension has conducted the Maryland Dairy Farm Business Summary education program. Through this education program, Extension educators work individually with dairy farmers to calculate their income and expenses per cwt and per cow. Data from all participating farms are then summarized to determine average income, expense, and profit per cwt. The most profitable and least profitable farms (profit per cwt.) are also averaged.

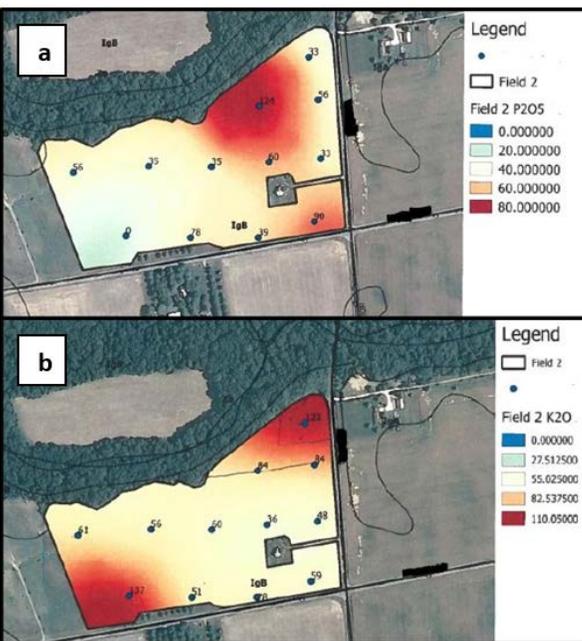


Figure 3: Nutrient application recommendations for P₂O₅ (a) and K₂O (b) based on multiple soil samples. Lowest rates in blue and highest rates in red.

Further Reading:

Ferguson, R.B. and G.W. Hergert. 2009. Soil Sampling for Precision Agriculture. University of Nebraska Extension. EC154.

Nanni, M.R. et al. 2011. Optimum size in grid soil sampling for variable rate application in site-specific management. *Sci. Agric.* 68(3): 386-392.

We have also calculated averages for confinement and grazing operations. We loosely define confinement operations as ones in which the lactating herd spends most of the time in the free stall or stanchion barns. We define grazing operations as those in which the lactating herd is intensively managed on pasture to produce a significant portion of the herd's feed intake during the year.

The attached tables summarize income, expenses, and profit for 30 Maryland farms. They show averages per year for 3 years, from 2012-2014. They also show the averages for the highest and lowest 10 farms, 19 confinement farms, and 11 grazers. As you compare your farm to the averages, you may want to take a careful look at costs that are more than 20 percent higher than the average to see if you can improve your management of those areas of your business. If some of your costs are more than 20 percent lower than average, then these may be areas of strength in your business.

As you examine the tables, keep in mind that they do not represent a random sample of farms. Farmers participated in this program voluntarily for their own education and their farms may not represent the Maryland dairy industry as a whole. However, the figures from the farms of all farmers who volunteered and participated were used to create the averages; the farms represented are not "hand-picked."

To participate in the Maryland Dairy Farm Business Summary, contact Dale Johnson at 301-432-2767, ext. 325 or email dmj@umd.edu.

2012-2014 Average of Maryland Dairy Farms
Income, Expenses, and Profit per COW

	Average 30 Farms	Highest 10 Farms	Lowest 10 Farms	Confinement 19 Farms	Grazing 11 Farms
1 Average number of cows	143	153	153	181	83
2 CWT of milk sold per cow	191	183	187	211	117
3 Farm income					
4 Milk sales	4,329	4,338	4,236	4,702	2,933
5 Cattle sales	355	415	301	341	351
6 Other income	538	300	708	780	167
7 Total income	5,222	5,053	5,245	5,823	3,452
8 Farm expenses					
9 Feed purchased	1,323	917	1,804	1,463	822
10 Seed, fertilizer, chemicals	514	620	356	571	195
11 Depreciation and repairs	754	591	816	877	530
12 Labor	294	342	298	392	90
13 Medical and breeding	179	126	222	212	74
14 Car, Truck, Fuel, Hauling	386	323	433	482	213
15 Rent	158	157	118	165	141
16 Interest	116	74	116	132	74
17 Custom hire	194	213	158	205	111
18 Other expenses	528	516	547	582	369
19 Total Expenses	4,443	3,870	4,869	5,078	2,618
20 Profit per COW	779	1,184	373	745	833

2012-2014 Average of Maryland Dairy Farms
Income, Expenses, and Profit per CWT

	Average 30 Farms	Highest 10 Farms*	Lowest 10 Farms*	Confinement 19 Farms	Grazing 11 Farms
1 Average number of cows	143	148	176	181	83
2 CWT of milk sold per cow	191	177	210	211	117
3 Farm income					
4 Milk sales	22.62	23.84	22.03	22.33	25.08
5 Cattle sales	1.86	2.30	1.55	1.62	3.00
6 Other income	2.81	1.72	4.07	3.71	1.43
7 Total income	27.29	27.86	27.65	27.66	29.52
8 Farm expenses					
9 Feed purchased	6.91	4.94	8.77	6.95	7.03
10 Seed, fertilizer, chemicals	2.68	3.42	2.45	2.71	1.66
11 Depreciation and repairs	3.94	3.37	4.22	4.17	4.53
12 Labor	1.54	1.86	1.73	1.86	0.77
13 Medical and breeding	0.94	0.67	1.12	1.01	0.63
14 Car, Truck, Fuel, Hauling	2.02	1.87	2.19	2.29	1.82
15 Rent	0.82	0.82	0.80	0.78	1.20
16 Interest	0.60	0.45	0.54	0.63	0.63
17 Custom hire	1.02	1.10	0.97	0.97	0.95
18 Other expenses	2.76	2.78	2.75	2.76	3.16
19 Total Expenses	23.21	21.24	25.55	24.12	22.39
20 Profit per CWT	4.07	6.61	2.11	3.54	7.13

*Ordering by profitability per CWT results in a different set of farms than profitability per COW

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Wild & Woolly
Maryland's Sheep & Goat Producer Newsletter

Wild & Woolly is a quarterly newsletter for sheep and goat producers and anyone else interested in small ruminants.

For more information, contact Susan Schoenian, Sheep & Goat Specialist, University of Maryland Extension, 301-432-2767 x 343 or sschoen@umd.edu

The summer 2015 issue of Wild & Woolly has been published to the Maryland Small Ruminant Page. <http://www.sheepandgoat.com/>

This is the first newsletter issue to be published to the newly designed web site. There are links to the newsletter on the home page.

The newsletter is also available on ISSUU and as a PDF file: http://media.wix.com/ugd/aded98_a18aa34c14c44f1ea9f5a4dd3eccfb3b.pdf

<http://issuu.com/mdsheepgoat/docs/summer2015>

EPA Pesticide Program Updates

From EPA's Office of Pesticide Programs

www.epa.gov/pesticides

EPA Proposes Stronger Standards for People Applying the Pesticides with the Greatest Risk
Improved training and minimum age requirements for certified applicators will help protect people and the environment.

The U.S. Environmental Protection Agency (EPA) is proposing stronger standards for pesticide applicators who apply "restricted-use" pesticides. These pesticides are not available for purchase by the general public, require special handling, and may only be applied by a certified applicator or someone working under his or her direct supervision.

"We are committed to keeping our communities safe, protecting our environment and protecting workers and their families, said Jim Jones, EPA Assistant Administrator for the Office of Chemical Safety and Pollution Prevention. "By improving training and certification, those who apply these restricted use pesticides will have better knowledge and ability to use these pesticides safely."

The goal of today's action is to reduce the likelihood of harm from the misapplication of toxic pesticides and ensure a consistent level of protection among states.

Pesticide use would be safer with increased supervision and oversight.

EPA is proposing stricter standards for people certified to use restricted use pesticides and to require all people who apply restricted use pesticides to be at least 18 years old. Certifications would have to be renewed every 3 years.

EPA is proposing additional specialized licensing for certain methods of application that can pose greater risks if not conducted properly, such as fumigation and aerial application. For further protection, those working under the supervision of certified applicators would now need training on using pesticides safely and protecting their families from take-home pesticide exposure.

State agencies issue licenses to pesticide applicators who need to demonstrate under an EPA-approved program their ability to use these products safely. The proposed revisions would reduce the burden on applicators and pest control companies that work across state lines. The proposal promotes consistency across state programs by encouraging inter-state recognition of licenses.

The proposal also updates the requirements for States, Tribes, and Federal agencies that administer their own certification programs to incorporate the strengthened standards. Many states already have in place some or many of EPA's proposed changes. The proposed changes would raise the bar nationally to a level that most states have already achieved. The estimated benefits of \$80.5 million would be due to fewer acute pesticide incidents to people.

EPA encourages public comment on the proposed improvements. The 90 day public comment period will begin when the proposal is published in the Federal Register.

A copy of the proposal and more information about certification for pesticide applicators:
<http://www2.epa.gov/pesticide-worker-safety/epa-proposes-stronger-standards-people-applying-riskiest-pesticides>

To comment on the proposed changes, visit <http://www.regulations.gov> and search for docket number EPA-HQ-OPP-2011-0183 after publication in the federal register.

EPA Site Quick Finder

[About EPA's Pesticides Program](#)

[Types of Pesticides](#)

[Frequently Asked Questions](#)

Answers to questions from the public.

[Fact Sheets](#)

[Information Sources](#)

[Pesticide Program Reports](#)

Reports produced by the Office of Pesticide Programs

[Annual Reports](#), [Performance Management &](#)

[Accountability](#), [Pesticide Industry Sales and Usage](#),

[Progress Reports](#), [Restricted Use Products Reports](#)

[Pesticide News Stories](#)

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To comment on the proposed changes, visit <http://www.regulations.gov> and search for docket number EPA-HQ-OPP-2011-0183 after publication in the federal register.

Article of Interest



Junk Science, Reporting, and Sources

Science information often passes through many hands before it gets to the public. As University of Florida professor Dr. Kevin Folta said, "It is really unfortunate that non-scientists who are excited to sensationalize an issue distort legitimate science." Some misinterpret or slant information--even press releases can be misleading. The best advice from the experts is to [read carefully and go to the original source](#).

As Dr. David Songstad's [recent article explained](#), CAST is one example of a source that provides credible information. <http://www.cast-science.org/>

Educational Opportunities



The University of Maryland Extension (UME)'s Woodland Stewardship Education program serves woodland owners, natural resource professionals and interested citizens. Please consider attending one of these offerings. Additional events are listed on the Event Calendar at <http://extension.umd.edu/woodland>.

There are three events in this email:

1. **Forestry Friday: Forest Tree & Shrub**

Identification – Friday, August 28, 2015, 1:00 pm – 4:30 pm, Western Maryland Research & Education Center, Keedysville, MD

Identifying trees and shrubs is a real challenge to woodland owners that want to learn more about what is growing on their property and carry out management activities. To control invasive species, thin the woods, or cut firewood, you want to make sure you are treating the right plant and not harming more desirable ones. This workshop will provide a tree identification book and easy-to-use key to help you figure out what it what, along with samples and field identification of trees found at the Western Maryland Research & Education Center. Instruction will cover leaves, bark, form, location and other factors that will help you identify trees. The instructor, Jonathan Kays, Natural Resource Extension Specialist, with the University of Maryland Extension, will share some tricks and shortcuts to aid in telling those oaks apart and other common sources of confusion.

The cost for the workshop is \$5.00 per person. For more information and to register, go to <https://umeforestryfridaytreeandshrubid.eventbrite.com>. **Registration closes August 24, 2015.**

2. **Maryland Tree Farm/Maryland Forest Association Regional Meeting** – September 10, 2015, 6:00 pm – 8:30 pm, Allegany College of Maryland, Cumberland, MD

Join us for an evening of fellowship and information. Presentation topics include management of Emerald Ash Borer and Northern Long-Ear Bat. Around 7:30 pm, two concurrent presentations will discuss the new Tree Farm inspection and certification program and MFA-related topics, such as changes to the Sediment and Erosion Control standards. Dinner is included (nominal charge). Please contact MFA at (410) 823-1789 or director@mdforests.org to RSVP or for more information.

Additional meetings will be held October 14th at the American Legion in Salisbury, MD and October 27th at the Baltimore County Agricultural Center.

3. **Nature-based Forestry: The Pro Silva Movement in Europe** – September 17, 2015, 12:00 pm – 1:00 pm, online

The next presentation in our WSE Webinars series features Lyle Almond, University of Maryland Forest Stewardship Educator. Lyle will provide an overview of the "Pro Silva" movement that is sweeping across the continent. It promotes continuous cover forestry, which mimics natural forest stand development for optimizing social, ecological, and economic benefits. The webinar will include Lyle's first-hand experience with the movement through his work in the nation of Slovenia.

This webinar is free and will be conducted through Adobe Connect. Registration is requested. To register, go to <http://woodlandwebinars-prosilvamovement.eventbrite.com>.

Visit our website: <http://extension.umd.edu/woodland>



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2015 Crop Insurance Workshop

Registration is now open for the 2015 Crop Insurance Workshop on Sept. 10 at the DoubleTree Hotel in Annapolis. Currently confirmed speakers include: Gene Gantz of RMA, Mike Alston of RMA to discuss the Whole Farm Crop Insurance product, Stephen Frerichs to give an update from the Hill, and representative from USDA-FSA to give an update on Farm Bill implementation. We hope to have all our speakers confirmed and will distribute an agenda in the coming days.

Please register at:

<http://go.umd.edu/MDCropInsWorkshop>.



Agronomy News

A timely publication for commercial agronomic field crops and livestock industries available electronically in 2015 from April through October on the following dates: April 16; May 14; June 11; July 9; August 13; September 10; and October 22.

Published by the University of Maryland Extension Focus Teams 1) Agriculture and Food Systems; and 2) Environment and Natural Resources.



Submit Articles to:

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Article submission deadlines for 2015 at 4:30

p.m. on: April 15; May 13; June 10; July 8; August 12; September 9; and October 21.

The University of Maryland Extension programs are open to all and will not discriminate against anyone because of race, age, sex, color, sexual orientation, physical or mental disability, religion, ancestry, national origin, marital status, genetic information, political affiliation, and gender identity or expression.

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Homeowners Urged to Use Responsible Lawn Care Practices during Summer Months

With summer in full swing, the Maryland Department of Agriculture urges homeowners to allow established lawns to go dormant during the hot, dry weather. Applying fertilizer to force a lawn to turn green during its dormancy period can damage the grass and contribute to nutrient pollution in streams, rivers and the Chesapeake Bay. Dormant lawns will green up when cooler temperatures arrive and rainfall increases. To help shade grass and conserve moisture, raise the mower's cutting height by ½ inch to 1 inch during periods of hot, dry weather and leave grass clippings on the lawn as a source of free fertilizer. For more tips and information on Maryland's Lawn Fertilizer Law, visit www.mda.maryland.gov/fertilizer or extension.umd.edu/hgic

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