

Spr^{ing} 2011



The first day of spring is one thing, and the first spring day is another.
The difference between them is sometimes as great as a month.
- Henry Van Dyke, *Fisherman's Luck*, 1899

Greetings,

It's amazing how quickly we lose grasp of time as seasons shift from one to the other. It seems only a few days ago folks were busy pulling irrigation lines across parched fields and hoping for rain. Another year; another season; another chance for renewal is upon us.

It doesn't take many trips to the farm store to realize the price to play the game has increased. As fuel prices go up, so too will fertilizer and other input prices. Budget projections estimate average total per acre costs of \$560.00 for corn, \$370.00 for beans and \$436.00 for wheat. Even so, if the weather is favorable, there should still be ample room for profit given higher commodity prices. I hope folks look at risk management tools such as diversification, crop insurance and forward pricing options to lessen the loss if we do have another bad year.

The first issues of Fruit and Vegetable News and the Agronomy News, a statewide newsletter for our Maryland agriculture family, will be released in mid-March. This is an initiative of University of Maryland Extension's, Agriculture

& Natural Resources Profitability Impact team. The newsletters will be published twice a month during the growing season and will include topics pertinent to agronomic crop production, marketing and local issues.

In Southern Maryland, the hardcopy edition of the newsletter will be sent from the St. Mary's County Extension office. There will also be a companion statewide Vegetable and Fruit Newsletter that will be sent to applicable growers. You may elect to receive either newsletter electronically via email which is quicker and less expensive. To be added to the email list, please send a message to bbeale@umd.edu.

Articles will be contributed by University of Maryland Extension Specialists, Field Educators and other stake holders. The articles will provide cutting-edge information on ways to increase the productivity of our land in a sustainable way. As we are starting a new growing season, we at the University of Maryland Extension are committed to providing support for your production agriculture needs to help you, our state and the nation succeed. We are at your doorsteps with offices in every county of Maryland. Let us know how we can be of help. Have a great growing season!

Upcoming Events:

April 12:
Vegetable Equipment
Demonstration; 4-6 pm
Clements, MD

April 13:
Strawberry Twilight
Meeting; 6-8 pm
WYE research Facility

May 4:
Vineyard Twilight Tour
Evening, Southern
Maryland Vineyard, TBA



2011 Annual Strawberry/High Tunnel Twilight Meeting at the Wye Research & Education Center

**Wednesday, April 13, 2011
6:00 – 8:00 PM**

Meet at Farm Operations Complex, 211 Farm Lane, Queenstown, MD 21658

****Rain or Shine****

Hear: University of Maryland and USDA specialists discuss current research and other small fruit growing topics and “programmed production” of small fruit.

See: Four small fruit high tunnel trials.

We'll have refreshments and pre-registration is not necessary. If you need special assistance to attend this program, please call Debby Dant at 410-827-8056 X115, no later than April 6, 2011.

For additional program information, contact Michael Newell, Horticulture Crops Program Manager, 410-827-7388 or mnewell@umd.edu.

New Specialty Equipment Available for Rent

Demonstration Scheduled for April 12th
4 p.m. to 6 p.m. at Russell's Farm, 23635 Bayside Road, Clements, (located on Route 234 and Bayside Road).

Equipment demonstration includes Vacuum Seeder, Ferris Farm Seeder and Mulch Planter. Rain Date: April 19. For information call Joe Wood, (301) 481-5544, or Ben Beale/UME, (301) 475-4484.

New conservation tillage equipment and specialty farm implements are now available to farmers

throughout the Southern Maryland region, due in part to grants from the Southern Maryland Agricultural Development Commission (SMADC).

SMADC has compiled a complete inventory of new and existing equipment available throughout the five Southern Maryland counties hosted at www.smadc.com. The inventory details the contact information for the managing entities responsible for the storage and maintenance of the equipment and a brief description of the equipment specifications, appropriate uses, and current rental rates. County agencies are also planning training days to demonstrate the operation of the rental equipment in the upcoming weeks. Visit the SMADC website for schedules and equipment updates or call the local agency listed on the website.

Vineyard Twilight Tour

May 4th

Location: TBA

Review of Canopy Management and IPM for Local Vineyards

Dr. Joe Fiola, University of Maryland Viticulture expert, will be leading a vineyard field day event in our area on Wednesday, May 4.

This will include a "twilight tour" of a local vineyard with focus on current vineyard conditions and canopy management activities for this time of year. There will also be an indoor slideshow presentation. This event is OPEN to anyone in the local region who is currently growing or plans to grow grapes.

This is an exciting opportunity to interact with one of the preeminent viticultural experts in Maryland and the Eastern United States. Dr. Fiola works out of Western Maryland, so getting him here in Southern Maryland for a day is something not to be missed. Joe is also the top UMD resource for wine making, so come prepared with your enology questions, too.

Contact the Port of Leonardtown Winery Cooperative or the St. Mary's Extension Office for more information.

**Applications Sought for the New Printed
So. Maryland, So Good Farm Guide
– Deadline April 4, 2011–**

The Southern Maryland Agricultural Development Commission (SMADC) is pleased to announce that it will be updating the printed version of the *So. Maryland So Good Farm Guide*.

Since 2002, the Farm Guide has been SMADC's most popular and proven resource for connecting the region's farming community with consumers. It is a comprehensive listing of Southern Maryland farms, and also of restaurants, stores and other institutions that feature Southern Maryland farm products.

SMADC is now accepting renewal applications for those currently listed in the guide, and applications for new participants; additionally advertising opportunities are available for participants and any other interested businesses at affordable rates.

Deadline! There is no charge to be listed in the guide for applications and renewals received by April 4, 2011. A late fee of \$25 applies to



applications and renewals received from April 5 - April 15; NO applications or renewals will be accepted for the printed guide after April 15, 2011.

To be listed in the farm guide, or to purchase ad space, download an application at www.smadc.com or call SMADC staff at (301) 274-1922.

**The Word is Out: Roundup Ready®
Alfalfa Gains Approval for Spring Planting**

**Richard W. Taylor
Extension Agronomist
University of Delaware**

In a press release through Reuters on Jan. 27,



2011, the word came down that the United States Department of Agriculture (USDA) has approved GMO

alfalfa without restrictions and that the alfalfa can be planted as early as this spring. Surprising few in the agricultural community, Secretary Vilsack stated that there are no doubts about GMO crop safety and that APHIS has determined that Roundup Ready alfalfa is as safe as traditionally bred alfalfa.

Many in the industry had expected that a compromise was in the works that would place limitations and restrictions on planting Roundup Ready alfalfa and that the process of defining those limits and restrictions would delay approval past spring planting time. This worry proved unnecessary as no restrictions were announced on Thursday. Many conventional and organic producers are very worried that pollen from Roundup Ready alfalfa and carried by the bee pollinators will end up pollinating their conventional or organic alfalfa seed sources. Actual hay and feed producers have less to be concerned about since if they are managing their alfalfa correctly, the crop should never reach the seed set stage of growth. Also since alfalfa has its own regulatory means (autotoxicity) of preventing self-generated seed from germinating and establishing in an established stand of alfalfa, there should be minimal chance of contamination of a stand during its lifetime as a hay, greenchop, haylage, or grazing field.

Secretary Vilsack said that the USDA would promote research into how genetics could be used as a means of preventing contamination and research designed to improve detection of any contamination that might occur. The Secretary

will have the USDA set up two advisory committees to help ensure the availability of high-quality seed and to set up programs to try to protect the purity of the alfalfa germplasm base.

New Technology/Stewardship Agreement Required

 Farmers who plant Monsanto Technology (Roundup Ready, for example) are required to read, sign and comply with the Monsanto Technology/Stewardship Agreement (MTSA). If you have not renewed your MTSA within the **last year (2010 version or later)**, go to www.renewmtsa.com to begin the renewal process. Those without internet access may call 1-800-768-6387 (M-F, 7 am to 6 pm, CST). Some seed dealers may have the hardcopy form available as well.

What's New for Agronomic Weed Control: 2011

Dwight Lingenfelter and William Curran
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Websites:
<http://www.weeds.psu.edu>
<http://cmeg.psu.edu/>

CORN

Corvus 2.63SC (Bayer CropScience) is a newer corn herbicide premix that includes a novel corn safener to reduce the potential of crop injury. Corvus contains two active ingredients: isoxaflutole (HPPD-inhibitor in Balance Flexx) and thiencazuron (ALS-inhibitor) plus the corn safener. This safener called cyprosulfamide safens corn both pre and post and is reported by Bayer to increase corn metabolism of isoxaflutole. Corvus is a pre or early post herbicide that has a broader

weed control spectrum than Balance Flexx since it also contains thiencazuron which controls several grass and broadleaf weeds. Corvus can be applied either pre or early post (up to the V2 growth stage) at the typical rate of 5.6 fl oz/A. It will likely not provide adequate control of severe problem annual grasses (foxtails and panicum, etc.), so it is recommended that these herbicides be used in a planned pre followed by post program that include additional grass control. The addition of atrazine will also improve the weed control spectrum. Corvus can also be used to help with no-till burndown and provide some residual control of weeds including triazineresistant species. Penn State research has looked at Corvus over the past few years and noted limited crop injury and good weed control. Corvus contains herbicides in WSSA groups 2 and 27 (see discussion below about WSSA herbicide groups).

Prequel 45WG (DuPont) contains two herbicide modes of action, isoxaflutole (Balance, HPPD-inhibitor) plus rimsulfuron (Resolve, ALS-inhibitor). This is a similar product to Corvus, but Prequel does not contain a safener and must be applied before corn emergence. It provides some burndown and residual control of common broadleaves and some grasses when applied at the labeled rate of 1.66 to 2.5 oz/A. At labeled rates, it will either need to be mixed with other herbicides to provide better grass control or requires a post herbicide program to control escaped weeds. It is primarily designed for use in two-pass programs in GMO corn. Prequel contains herbicides in WSSA groups 2 and 27.

TripleFlex 4.25L (Monsanto) is a premix identical to SureStart (Dow AgroSciences) for control of annual weeds and contains acetochlor (TopNotch), flumetsulam (Python), clopyralid (Stinger), and a corn safener. It can be applied from pre to the early post stage (11-inch tall corn) and is intended to be used with Roundup Ready or Liberty Link field or silage corn hybrids. When applied pre, it is designed to provide early season control of common annual grasses and broadleaf weeds to allow better timing of the in-crop application of glyphosate or glufosinate. The use

rate on medium-texture soils ranges from 1.5 – 1.75 pints/A. TripleFlex does not contain atrazine, so it provides a nonatrazine alternative for atrazine-sensitive areas. However, atrazine, glyphosate, 2,4-D, and other herbicides can be tank-mixed with TripleFlex to broaden the weed control spectrum. Make sure to plant corn 1 ½ inches deep and be cautious of interactions with certain OP insecticides that may cause crop injury. Wheat may be planted 4 months after application; alfalfa, soybeans, barley, oats, and rye can be planted the following spring; sorghum after 12 months. TripleFlex contains herbicides in WSSA groups 2, 4, and 15.

CORN and SOYBEAN

Kixor (BASF) is a new active ingredient called, saflufenacil, a PPO-inhibitor herbicide similar to Valor and Authority herbicides. Much of the interest in Kixor in our region has been focused on the potential burndown activity of saflufenacil for glyphosate resistant horseweed or marestalk in no-till soybean and the opportunity to use a new mode of action (PPO) preemergence in corn. Relative to summer annual weeds, Kixor-powered products will provide burndown and residual activity on several broadleaf weeds including pigweed, lambsquarters, and nightshade. Kixor will not control grasses and the current labeled rates target small seeded broadleaves and shorter residual control. Additional herbicides may need to be tank-mixed with saflufenacil or applied post to control escaped weeds or to increase the control spectrum. BASF has developed prepackaged herbicide mixtures to supplement this need. These products will primarily be used as pre, “setup” herbicides since they typically will be used in a planned pre followed by post herbicide program. Although Kixor is a BASF trademark, saflufenacil products will include:

- **Sharpen** (saflufenacil alone) can be used in field corn, soybeans or small grains. The use rate in corn is 2 to 3 fl oz/A and in soybean it is 1 fl oz/A. Sharpen is a WSSA group 14 herbicide.
- **Verdict** (formerly Integrity) [saflufenacil + dimethenamid-P (Outlook)] can be used in corn and soybeans as a burndown/pre and this premix provides some annual broadleaf and grass residual

activity but at the labeled rate, post herbicides will likely be necessary to control escapes. The typical medium-soil use rate is 13 fl oz/A for corn and 5 fl oz/A for soybean. The lower use rate in soybeans results in less residual activity. Verdict contains herbicides in WSSA groups 14 and 15.

- **Optill** [saflufenacil + imazethapyr (Pursuit)] is designed as a “setup” herbicide for use in soybeans but it will likely need to be followed by glyphosate or other post herbicides. The targeted use rate is 2 oz/A. Optill contains herbicides in WSSA groups 2 and 14
- **Warrant 3CS** (Monsanto) contains encapsulated acetochlor and is designed to be used postemergence in soybeans and corn to provide residual control of later-emerging annual weeds. It provides residual control of foxtails, panicum, crabgrass, lambsquarters, pigweed, smartweed, and black nightshade. Warrant does NOT control emerged weeds so it must be tank-mixed with glyphosate (RR soybeans or corn) or Ignite (LL soybeans or corn) to control existing weeds. The typical use rate is 1.5 qt/A. Warrant is a WSSA group 15 herbicide.

SOYBEAN

Authority XL 70WG (FMC) is a premix of sulfentrazone (Authority, PPO inhibitor) and chlorimuron (Classic, ALS-inhibitor) and is similar to the old Canopy XL. Authority XL contains a higher rate of sulfentrazone than Canopy XL, so it should provide improved residual control of horseweed and eastern black nightshade while also controlling lambsquarters, pigweed, mustards, velvetleaf, and ragweed. In a two-pass system, apply 3.2 oz/A (typical medium soil rate) followed by glyphosate (RR soybeans) or Ignite (LL soybeans) as an in-crop application. The typical medium soil rate for full season control is 6.5 oz/A. Authority XL can be applied in the fall or at soybean planting time as a preplant or preemergence treatment. Be cautious of crop rotation restrictions: in general, wheat-4 months, field corn 10 months, and alfalfa-12 months. Higher soil pH greatly increases recropping intervals. Authority XL contains herbicides in WSSA groups 2 and 14.

Ignite 280 2.34SL (Bayer CropScience), formerly known as Liberty, is a newer higher-load formulation of glufosinate. Ignite is a post, broadspectrum herbicide that controls many annual broadleaf and grassy weeds and provides some suppression to biennials and perennials. The typical use rate for Ignite is 22 to 29 fl oz/A; include ammonium sulfate (AMS) at 3 lb/A to the spray solution (use only 1.5 lb/A if temperatures are expected to exceed 85°F). Do not apply more than 44 fl oz total/A/season. Keys to success with the LibertyLink soybean program include:

- Start clean. In no-till settings, a burndown program that kills all weeds before planting is essential. A pre application or a post application with a residual product may be required for broader spectrum and extended control in problematic fields. The use of soil residual herbicides before crop emergence can reduce the number of post applications required or provide a larger window for later season control.
- Include residual herbicides. Include an effective residual herbicide with the burndown followed by a timely post application of Ignite about 4 weeks after planting. Ignite can be slightly less effective on grasses than glyphosate such as yellow foxtail, shattercane, and barnyardgrass, but is more effective on some of the broadleaf weeds such as annual morningglory, eastern black nightshade, and smartweed. In the program, is best to include residual herbicides such as, Authority MTZ, Boundary, Valor, Sonic, Prefix, Pursuit, Envive, Prowl, Outlook, Optill, Intro, among others. Dual Magnum, Reflex, and Warrant can be tank-mixed with Ignite and applied postemergence.
- Use in glufosinate resistant soybeans. Ignite can be used on all LibertyLink soybean varieties from emergence up to bloom stage and has some limited utility for burndown situations (i.e. horseweed). If Ignite is used in the burndown program, no in-crop application of Ignite is allowed.
- Size matters. Although weed size is important with glyphosate, is it more critical with Ignite and spray applications should be made when weeds are no more than 4 to 6 inches tall.
- Uniform coverage necessary. Since it is a contact herbicide, it is weaker than glyphosate on perennials and requires uniform spray coverage to

achieve consistent weed control. Use a minimum spray volume of 15 gallons/A and nozzles that provide a uniform distribution of medium sized spray droplets.

- Weather and timing impact effectiveness. Warm temperatures, high humidity, and bright sunlight improve the performance of Ignite. Do not apply when heavy dew or mist/rain are evident. For more consistent lambsquarters and velvetleaf control apply between dawn and 2 hours before sunset (9 am to 6 pm is best).
- No extended control. Ignite does not have residual activity and will not control weeds not yet emerged. In studies at Penn State and other universities, some occasional temporary crop injury was observed to soybean, however no yield reductions were observed. Currently, there are no soybean varieties that have stacked gene traits of glyphosate and Ignite. This will likely be a benefit when it does occur. Ignite and the LL system are marketed as an alternative to a Roundup Ready (glyphosate resistant) system. It allows rotating herbicide modes of action to reduce the potential of developing glyphosate resistance biotypes of weeds. Unfortunately for Bayer and glyphosate resistance management, current low cost glyphosate will likely limit the utility of Ignite and Liberty Link crops. Ignite is a WSSA group 10 herbicide.

SMALL GRAINS

Huskie 29.6L (Bayer CropScience) contains pyrasulfotole (an HPPD-inhibitor) plus bromoxynil (Buctril) and controls broadleaf weeds in wheat, barley, and triticale. Huskie controls common chickweed, wild buckwheat, mustards, prickly lettuce, lambsquarters, pigweed, smartweed, ragweed, and velvetleaf. Apply 11 oz/A (plus AMS or UAN) to the small grains between 1 leaf and up to flag leaf emergence and to actively growing weed that have 1-4 leaves. Do not apply to crops undersown with legumes. Huskie can be tank-mixed with certain herbicides, insecticides and fungicides. In wheat, liquid nitrogen may be used as the carrier. Soybeans can be planted 4 months after application; alfalfa, corn, and potatoes after 9 months. Penn State researchers plan to test this product in wheat next

spring. Huskie contains herbicides in WSSA groups 6 and 27.

PowerFlex 7.5WDG (Dow AgroSciences) is a new ALS-inhibitor herbicide that contains pyroxsulam. It controls annual ryegrass, downy brome and cheat plus a few annual broadleaves such as chickweed (non-ALS resistant), mustards, henbit, wild buckwheat, and hairy vetch. When targeting grassy weeds, fall applications seem to provide the best control. Apply 3.5 oz/A once wheat reaches the 3leaf stage. PowerFlex has a favorable crop rotation timeframe. Soybeans can be planted after 3 months while other crops can be planted after 9 months. Penn State researchers have limited experience with this herbicide on weed control and crop injury potential in wheat. PowerFlex is a WSSA group 2 herbicide.

GRASS FORAGE

Paramount 75WG (BASF) contains quinclorac and can be applied in cool-season grass pastures or hay. Paramount is currently the only herbicide labeled that controls some annual grasses in grass forages. According to the label it has activity on foxtails, large crabgrass, and barnyardgrass as well as broadleaves such as lambsquarters, ragweed, velvetleaf, annual morningglory, dandelion, and field/hedge bindweed. Paramount can be applied in bromegrass, tall fescue, Kentucky bluegrass, orchardgrass, and ryegrass. It is also labeled for use on several warm-season grasses. The typical use rate is 3 to 8 oz/A plus necessary adjuvants. A waiting period of 7 days is required before cutting. Paramount will severely injure or kill clovers, alfalfa, and other legumes. Be cautious of crop rotation restrictions. Paramount is a WSSA group 4 herbicide.

PENDING PRODUCTS

Pyroxasulfone is an experimental herbicide (formerly coded as KIH-485) that is expected to be labeled in corn (all types), soybeans and wheat. It has annual grass activity similar to metolachlor (Dual) and acetochlor (Harness) but also provides good control of several annual broadleaves. The

use rates are up to 8 times lower than Dual or Harness with comparable weed control. BASF will sell pyroxasulfone as **Zidua 85WG**, but will likely premix it with other active ingredients. Valent and FMC will also have some premixes. **Fierce 76WG** (Valent) contains pyroxasulfone plus flumioxazin (Valor SX) and will initially be labeled for burndown/residual use in field corn and soybeans. Anticipate EPA approval by early to mid 2011 with full scale marketing of products by 2012. Penn State has evaluated pyroxasulfone for the past several years in corn and has noted very good weed control performance and crop safety.

Realm Q (DuPont) contains rimsulfuron (Resolve, ALS-inhibitor), mesotrione (Callisto, HPPD-inhibitor) and the corn safener (isoxadifen). DuPont claims this safener allows more flexibility to apply the herbicides across a diversity of application conditions. The safener does not totally eliminate potential crop injury, just lessens the impact. Realm Q will likely be applied at 4 oz/A and can be tank-mixed and applied post with glyphosate, Ignite, or included in other post herbicide programs to improve weed control spectrum. Realm Q contains herbicides in WSSA groups 2 and 27.

GENERICCS

More and more generic products are being sold due to patent expiration and licensing agreements. Some of the more commonly used generic products are those that strive to mimic Bicep and Harness products, Prowl, Cimarron, and Harmony. In most cases, generic herbicides cost less than name-brands. When looking to purchase generic alternatives, ask or search for the herbicide by its chemical name or active ingredient, for example, glyphosate, metolachlor, dicamba. Not all generics are equal to the original. Always read the label and be cautious of how it is formulated since it may not have equivalent amounts of active ingredients and therefore the quality and application rates may be different. Relative to quality, generic products may or may not be as sound as the original and there could be problems with mixing and compatibility with

other pesticides. Some of the generics are not labeled for use on the same crops or allowed to be applied in certain situations. Watch out for offers that sound too good to be true or promise too much. In addition, most generic herbicides will not include product service or guarantees if weeds are not controlled or crop injury occurs. It is best to consider all factors such as product quality, rebates, warranties and not just price before purchasing a generic herbicide.

WSSA Herbicide Groups

As more weed species become resistant to herbicides, certain precautions such as tank-mixing, crop rotations, and a combination of weed management techniques, must be implemented to prevent resistance. Understanding herbicide modes of action is a key factor in this process. The Weed Science Society of America (WSSA) developed a grouping system to help with this process. Herbicides that are classified as the same group number kill weeds using the same mode of action. *Thus, it is best to select or combine herbicides that provide at least two different modes of action against the same weed.* Group numbers can be found on many herbicide product labels and can be used as a tool to choose herbicides in different mode of action groups so mixtures or rotations of active ingredients can be planned to better manage weeds and reduce the potential for resistant weed species. A useful chart can be found at:

<http://www.glyphosateweeds crops.org/Pubs.html>

Other News – Incoming Herbicide Resistant Crops

DHT is the acronym for Dow AgroSciences Herbicide Tolerance traits that will provide overall tolerance in corn and soybeans to 2,4-D and some of the post-grass herbicides like Assure and Fusilade. These traits also will be stacked with glyphosate tolerant traits. Dow AgroSciences estimates launch timing for this technology at 2013 for corn and 2015 for soybeans.

Dicamba resistant soybeans are being developed by Monsanto and BASF to allow pre or post

applications of dicamba (active ingredient in Clarity, Banvel, etc.) on soybeans. These varieties will likely be stacked with the Roundup Ready trait. Marketing of these soybean varieties is not expected until 2014 or later. In general, there are some benefits and risks associated with DHT and dicamba-resistant technologies. Overall, we can expect to see better annual and perennial broadleaf weed control in soybeans. Also these traits will offer some protection from drift and spray tank contamination. However, off-site movement of 2,4-D and dicamba to sensitive non-target plants is of great concern. In a diverse landscape like Pennsylvania, this will be more of a concern than perhaps for our neighbors to the west. Over the next few years, we will see how these companies and universities devise ways to handle these issues.

Optimum GAT corn and soybean debut has been delayed. Optimum GAT confers resistance to glyphosate and ALS-inhibitor herbicides. DuPont and Pioneer have been working on this technology for the past several years, but no revised release date has been set.

Will Your Crop Suffer from Sulfur Deficiency this Cropping Year?

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Past and recent emphasis has been placed on reducing sulfur (S) emissions from power plants, diesel vehicles, and other industries. The question of whether the Clean Air Act and other programs run by the Environmental Protection Agency are accomplishing their objectives can be answered by the farm community with respect to sulfur emissions. The answer growers would likely give is that yes the air quality programs have worked but so well that their crops are increasingly showing sulfur deficiency symptoms; especially when grown on sandy, low organic matter, non-manured soils.

Why is S critical for maximum economic yields (MEY)? Sulfur is needed by a crop when making certain amino acids such as cystine and methionine that are vital components of many proteins. The entire factory output (yield) of a crop is dependent on proteins that make up the chlorophyll molecule, all the plant enzyme systems, the plant's genetic material such as DNA, the assimilation function of legume rhizobia, and all the inter-related metabolic activity in the plant. The ideal nitrogen (N) to sulfur ratio in a plant is 15:1. Above that ratio, the S concentration is not adequate for MEY.

Sources for S include commercial fertilizers, atmospheric deposition, and manures or biosolids. The movement away from the old superphosphate (16 to 22% P₂O₅ and 12 to 14% S) to triple superphosphates in the late 1900's and then more recently to ammonium phosphates and ammonium polyphosphates (DAP, MAP, and others) has reduced the amount of S fertilizer applied without us consciously being aware of the trend. With the success of the Clean Air Act, atmospheric S deposition had dramatically decreased even before the very recent change over to ultra low sulfur diesel fuel. In addition, the emphasis on nutrient management planning to reduce manure application rates due to phosphorous buildup in the soil and the development of programs to help move poultry manure to areas without manure resources has also contributed to reduced S application rates.

Who should be concerned about the potential for S deficiency on their crops? The answer is that probably everyone but especially those growers with coarse textured soils, with soils low in organic matter, or with soils that have received enough rainfall or irrigation water to leach S below the crop rooting zone should be concerned. For shallow rooted crops such as wheat and barley, it is especially critical to ensure that adequate S is available during tillering and early growth and development. Growers should consider adding enough ammonium sulfate to their normal nitrogen application to provide from 20 to 30 lbs of S per acre in the first N application split in the spring.

If there is adequate S accumulation in the soil clay subsoil as determined with a deep soil test, S fertilization may not be a yield limiting factor on deep rooted crops such as corn. However, this

does not mean that early season growth won't be improved with the early season addition of some type of sulfate fertilizer. Even in high yield irrigated environments, such an application could help improve yield potential or at least not limit yield.

Some growers will want to rely on soil test results to make a decision on whether to add S fertilizer. These growers should be aware that the normal soil test depth of 0 to 6 or 0 to 8 inches is not as good an indicator of soil S status as it is for phosphorus and potassium. Sulfur is taken up by plants as the sulfate (SO₄²⁻) ion and as an anion (negatively charged ion) in the soil that is similar to nitrate. It is subject to loss via leaching and anaerobic conditions (similar to denitrification).

Sulfur deficiency symptoms vaguely resemble those of N except that S unlike N is not mobile in the plant so symptoms occur first on new growth. Sulfur deficiency is most often described as stunting with general yellowing or chlorosis of the plant. For examples, please review the photos at the end of this article.

The choices available for fertilizing with S include ammonium sulfate and potassium magnesium sulfate (K-PoMag) plus ammonium thiosulfate, calcium sulfate (gypsum), magnesium sulfate (Epsom salts), potassium sulfate, and elemental sulfur. Sulfate is immediately available for plant uptake whereas elemental S⁰ must be oxidized by the soil bacteria (requiring warm soil temperatures and adequate moisture) into sulfate before plants can absorb the S. Organic sources (manures, crop residues, biosolids) must undergo mineralization into inorganic sulfate before being available for plant uptake.

Other by-products such as derivatives from battery acid are sold as S sources but should be evaluated carefully by the grower to be certain that potential problems such as heavy metal contamination, non-available S forms, or injurious compounds are not present. Even then the S form in some by-products will need to be converted into plant available forms by the soil microorganisms and if S is needed immediately or if soil conditions are not favorable for this conversion yield potential could be impacted negatively. Certainly, any form other than the sulfate form is not appropriate in-season when deficiency symptoms indicate the immediate need for S.



Photo 1. Induced sulfur deficiency in corn grown in sand culture. Note reddening of lower stem, general chlorosis or yellowing especially of new growth, and stunting of the plant.



Photo 2. Field corn showing stunting and general chlorosis or yellowing especially of new growth on sandy soil in southern Delaware. Photo by Richard Taylor.



Photo 3. Sulfur deficiency in barley grown on a very light sandy soil low in organic matter in Sussex County, Delaware. Note general chlorosis or yellowing especially of new growth and severe plant stunting. Photo by Richard Taylor.



Photo 4. Sulfur deficiency in wheat grown on a very light soil low in organic matter in Sussex County, Delaware. Note general chlorosis or yellowing especially of new growth and severe plant stunting. Photo by Richard Taylor.

Initial Results from the Mid-Atlantic Orchardgrass Survey

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Growers across the Mid-Atlantic region have experienced problems with orchardgrass stands in recent years. Reduced forage yield, fewer hay harvests each year and premature death of orchardgrass stands have been reported and confirmed in University sponsored forage variety trials. Estimates suggest lower orchardgrass yields and premature death of stands may be costing hay producers over \$90 million a year. With the help of Extension agents in Virginia and other neighboring states, I organized a survey to help answer questions about this orchardgrass problem and perhaps find the path to a solution.

The survey contained 28 questions that covered a wide range of issues. Data were entered on-line by agents who interviewed growers – usually in the field. Soil samples from many fields were collected and analyzed for standard soil nutrients. By the end of 2010, 43 orchardgrass fields had been surveyed across 4 states and 22 counties. Below is a summary of the more significant findings:

- 74% felt their stands had declined faster than expected.
- 64% of the problem fields were planted in last 5 years.
- 53% harvest hay twice per year, 30% harvest hay three times each year.
- 86% cut stands to the recommended 3-4 inch stubble height.
- 63% reported no visible insect or disease problems.
- 86% apply nitrogen fertilizer every year.
- 79% had a soil test done within last 3 yr.
- P and K ratings for most fields were in the Low to Medium range.
- Cultivar type appeared unrelated to poor stand persistence.

Overall, most growers reported poor stand persistence and these included seemingly well-managed stands. None of the individual variables surveyed (e.g., pests, disease, cutting management, soil fertility) were well correlated with poor orchardgrass persistence.

So what might have caused these orchardgrass problems? Well, the evidence probably points to a combination of factors, and I suspect a major player was climate. For example, from June 2007 to April 2008, approximately 90% of Virginia was under drought. Drought conditions also were widespread in 2006, 2008 and 2009 but for shorter duration. Moreover, since 1960 mean air temperature has increased by 0.3 deg F each decade. Warmer temperatures and periodic droughts surely stressed many orchardgrass stands in recent years. When combined with other issues, like low soil fertility, these environmental stressors probably contributed to many problems observed by growers. If this climate hypothesis is correct and temperatures continue to rise, as they have been, growers in Virginia might consider switching to more stress tolerant forage species (e.g., novel tall fescue varieties) to replace declining orchardgrass stands.

Producing and Sourcing Quality Transplants

Gordon Johnson, Extension Vegetable & Fruit Specialist; gcjohn@udel.edu

Article from: University of Delaware Weekly Crop Update; Volume 19, Issue 1

Transplant production is underway throughout the region. Cabbage, tomatoes, peppers, watermelons, cantaloupes, cucumbers, squash, lettuce, and even pole lima beans are commonly transplanted along with many other vegetables.

Producing quality transplants starts with disease free seed, a clean greenhouse and clean planting trays. Many of our vegetable disease problems including bacterial spot, bacterial speck, bacterial canker, gummy stem blight, bacterial fruit blotch, tomato spotted wilt virus, impatiens necrotic spot virus, and Alternaria blight can start in the greenhouse and be carried to the field. A number of virus diseases are transmitted by greenhouse insects.

Buy disease indexed seeds when available. To reduce bacterial seed borne diseases in some crops such as tomatoes, peppers, and cabbages, seeds can be hot water treated. Chlorine treatment can also be useful on some seeds as a surface treatment but will not kill pathogens inside the seed. Go to this factsheet for more details: <http://ohioline.osu.edu/hyg-fact/3000/3085.html>.

If possible, do not grow ornamental plants in the same greenhouse as your vegetable transplants and do not overwinter any plants in areas where transplants are to be grown.

For greenhouse growing areas, remove any weeds and dead plant materials and clean floors and benches thoroughly of any organic residue. Use a disinfectant applied to surfaces to kill pathogens. Choices are: quaternary ammonium products (Qam), chlorine bleach in a 1 part bleach to 9 parts water ratio, or hydrogen dioxide products. If possible, use new planting trays. If trays are reused, then one of these products should be used

to disinfect trays. Bleach and Qam products require 10 or more minutes of contact to be effective.

One of the most important considerations is managing stretch or height of transplants. The goal is to have a transplant of a size that it can be handled by mechanical transplanters without damage and that have reduced susceptibility to wind.

Managing transplant height can be a challenge. Most growth regulators that are used for bedding plants are not registered for vegetable transplants. One exception is Sumagic which is registered for use as a foliar spray on tomato, pepper, eggplant, groundcherry, pepino and tomatillo transplants. See this past WCU article for more information: <http://agdev.anr.udel.edu/weekllycropupdate/?p=804>. Research is being conducted on ABA products for transplant management and other products may be registered in the future.

For other crops alternative methods for height control must be used. One method that is successful is the use of temperature differential or DIF, the difference between day and night temperatures in the greenhouse. In most heating programs, a greenhouse will be much warmer in the daytime than nighttime. The greater this difference, the more potential for stretch. By reducing the day-night temperature difference, or reversing it, you can greatly reduce stem elongation. The critical period during a day for height control is the first 2 to 3 hours following sunrise. By lowering the temperature during this 3-hour period plant height in many vegetables can be controlled. Drop air temperature to 50° – 55°F for 2-3 hours starting just before dawn, and then go back to 60° – 70°F. Vegetables vary in their response to DIF. For example, tomatoes are very responsive, squash is much less responsive.

Mechanical movements over transplants can also reduce size. You accomplish this by brushing over the tops twice daily with a pipe or wand made of soft or smooth material. Crops responding to mechanical height control include tomatoes, eggplant, and cucumbers. Peppers are damaged with this method.

Managing water can be a tool to control stretch in some vegetables. After plants have sufficient size, allow plants to go through some stress cycles, allowing plants to approach wilting before watering again. Be careful not to stress plants so much that they are damaged.

Managing greenhouse fertilizer programs is another tool for controlling height. Most greenhouse media comes with a starter nutrient charge, good for about 3-4 weeks. After that, you need to apply fertilizers, commonly done with a liquid feed program. Greenhouse fertilizers that are high in ammonium forms of nitrogen will cause more stretch than those with high amounts of nitrate nitrogen sources. Fertilizers that are high in phosphorus will also tend to lead to stretch.

Exposing plants to outside conditions is used for the hardening off process prior to transplanting. You can also use this for height control during the production period. Roll out benches that can be moved outside of the greenhouse for a portion of the day or wagons that can be moved into and out of the greenhouse can be used for this.

Seedless watermelons have specific requirements: germination at high temperatures for 24 hours (to achieve even germination) then move immediately into a cooler greenhouse to grow out. See this past WCU article for more information <http://agdev.anr.udel.edu/weekllycropupdate/?p=1714>.

Many growers choose not to produce their own transplants but contract with greenhouse growers locally or in the South. Majorities of these transplants are of high quality and perform well in the field. However, each year, there are some shipments that have problems. The most common problem is transplants shipped before they are ready – without adequate root systems. These transplants will not perform well in the field, especially in earlier plantings. If possible, they should be placed in a greenhouse to finish growing before use.

Another issue is diseases. Bacterial diseases (such as bacterial spot), fungal blights (such as Alternaria or Gummy Stem), and viruses (such as

Tomato Spotted Wilt Virus and INSV) have all been found in transplants at times. If a disease is suspected, have it quickly diagnosed and inform the Plant Industries section of the Delaware Department of Agriculture. Do not plant diseased plants in the field. Southern grown transplants are most often the source so make sure that you are dealing with a grower with a good reputation for producing disease free plants.

Plants that are shipped without trays (already pulled) or that are bare rooted that are packed tightly in boxes must be planted quickly. Delays will lead to plant deterioration, leaf loss, and potential disease buildup.

“Don't spend your precious time asking "Why isn't the world a better place?" It will only be time wasted. The question to ask is "How can I make it better?" To that there is an answer.”
(Leo F. Buscaglia)

Brown Marmorated Stink Bug

Most have probably seen or heard about the Brown Marmorated Stink Bug (BMSB) over the last several months. The BMSB caused significant economic damage to tree fruit and vegetable growers in Central and Northern Md last year. I noticed the BMSB showing up in St. Mary's County at the end of August, though little damage was reported. The BMSB hibernate inside of houses and other structures. I can find them almost any day in the Extension office or my house. The BMSB is native to Asia, which means there are few natural enemies. Most insecticides are limited in effectiveness as well. We will need to wait and see how much of a problem they will be in 2011. Keep a lookout as they emerge this spring.

Article adapted from: **Summary of 2010 Studies of Brown Marmorated Stink Bug on Soybean in Maryland**; Galen Dively and Terry Patton, University of Maryland

For full article see:

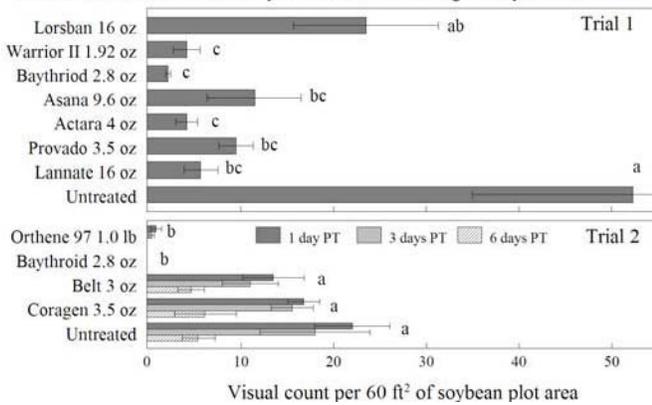
<http://www.frederick.umd.edu/files/Stinkbug-Dively2010studiesofBMSBonSoybeaninMaryland.pdf>

Range of BMSB infestations throughout the state. Populations exploded in 2010 and increased by 5- to 10-fold in many areas of the state. Road surveys and feedback from extension educators and crop advisors reported field infestations in soybeans in all counties, except St. Mary's, lower portion of Charles, and the lower three counties on the Eastern Shore. Highest infestations were found in western and central Maryland, including Anne Arundel and Prince Georges Counties.

Blacklight traps operating at research farms also revealed the highest captures at Keedysville in Washington County, followed by the Beltsville and Upper Marlboro locations. Adult flights peaked around mid August which corresponds to the time when soybeans were colonized. Stink bugs were detected in traps on the Eastern Shore but at much lower numbers. It is clear that vehicles are a main means by which stinkbugs are expanding their range in the state.

Weekly sampling was conducted in several corn and soybean fields on the Western MD REC farm at Keedysville. Results in Fig. 3 show peak densities of about 6 stink bugs per corn plant or per 25 sweeps in soybeans at the field edges. Adults exited senescing corn fields during mid August and began colonizing soybeans. Field infestations exhibited strong edge effects in which numbers of bugs are highest within 10 feet from the field margins, especially abundant next to woodlots; and then numbers quickly drop off toward the field interior. BMSB caused a delay in soybean senescence along the field edges, known as green stem syndrome. Infested plants stayed green longer because the salivary fluids injected during feeding affected the plant maturation process.

Figure 4. Results of insecticide trials to evaluate the efficacy against BMSB. Means within trials followed by same letter are not significantly different. 2010.



Efficacy of registered insecticides for BMSB control.

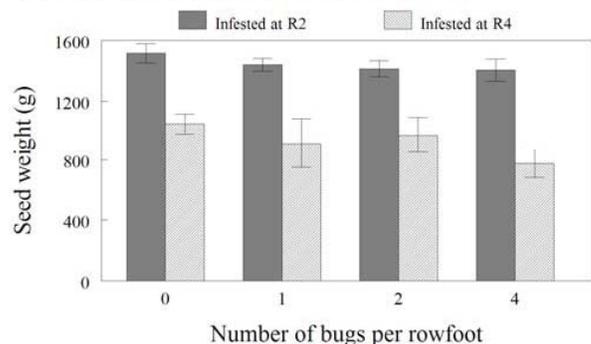
Two insecticide trials (Fig. 4) were conducted at the Beltsville research farm at different times. Trial 1 was evaluated 4 days after treatment and results showed that 80-90% control was achieved by a single application of several pyrethroids (Baythroid, Warrior II, Asana), Lannate, and two foliar neonicotinoids (Actara, Provado). Lorsban was the least effective. Trial 2 tested additional systemic products including Orthene, Belt, and Coragen.

Orthene and Baythroid provided effective residual control up to 6 days post treatment, while Belt and Coragen were relatively ineffective. Though these results are promising, additional tests are needed to evaluate other products, variable rates, and application strategies. In particular, perimeter treatments may be the most economical and effective strategy, given the behavior of this insect along the field margins.

Extent and nature of BMSB feeding injury. We monitored BMSB populations at two research farms (Keedysville and Beltsville) and determined that this insect probably goes through two generations per year. It was first recorded as overwintered adults on trees in mid May; then adults colonized vegetable crops, mainly tomato, pepper, and cucurbit crops, followed by infestations on developing ears of field corn and sweet corn; and finally it began to colonize

soybean fields in mid to late August. In each crop, adults laid eggs and produce immatures (nymphs), so it is clear that many crops are at risk throughout most of the growing season. We also manually infested plots of soybean plants (2 rows 10 ft. long) covered by screened cages with densities of 0, 1, 2, and 4 late to mid stage nymphs per foot of row. The double-crop soybeans ('Asgrow') were planted on July 1. Replicated infestations were introduced at R2 and R4 stages of soybean growth. Introduced populations were allowed to develop and feed for 2 weeks after which cages were removed and plots were treated with Warrior to prevent further injury. On November 3, all plots were harvested with small motorized thresher. Fig. 5 shows the average seed weight (\pm SEM) from cages infested with different numbers of nymphs at the two plant growth stages. Main effects of density or its interaction with stage were not significantly different. However, the trend in the data showed a slight decline in seed weight with higher infestations at R2 and an even greater decline at R4. The cages placed over plants at R4 significantly affected yields compared to the overall yields in the R2 cages. The data on seed quality and the composition of pod types were not ready for analysis as of the writing of this proposal. One conclusion is that the stink bug densities tested was not high enough to represent the levels that were observed in many soybean fields in Western MD. A similar cage study was conducted by Dr. Ames Herbert and his graduate student in Virginia. These studies are part of a larger project by the BMSB Working Group including USDA and University scientists from the Mid-Atlantic area.

Figure 5. Seed weight per 20 rowfeet of double-crop soybean plants included in cages infested with BMSB nymphs at the R2 and R4 growth stages. 2010.



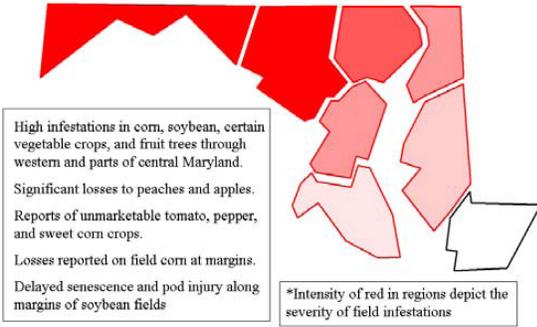


Figure 1. Distribution range of brown marmorated stink bugs in Maryland during 2010. Based on field surveys and reports from extension educators, crop advisors, and growers.

For more information on the Brown Marmorated Stink Bug, visit these sites:

- <http://ento.psu.edu/extension/factsheets/pdf/BrownMarmoratedStinkBug.pdf>
- <http://www.hgic.umd.edu/content/timelytips.cfm>
- http://www.hgic.umd.edu/content/documents/Stink_Bug_Pest_Alert.pdf
- <http://www.hgic.umd.edu/content/documents/BrownMarmoratedStinkBug.pdf>
- <http://www.ipmnet.umd.edu/landscape/docs/BMSB-UMD.pdf>

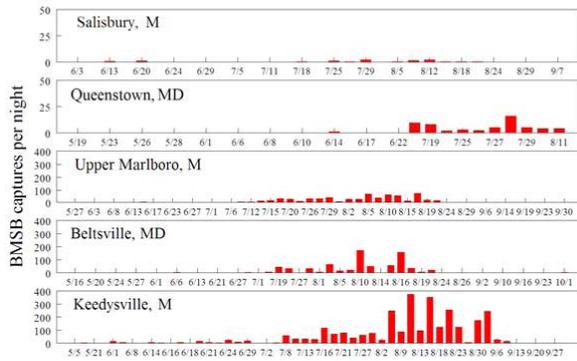


Figure 2. Blacklight trap captures of adult brown marmorated stink bugs. 2010

St. Mary's Agricultural Service Center

St. Mary's County has a new Agricultural Center located at 26737 Radio Station Way in Leonardtown. The Ag Center opened its doors on December 29, 2010 when the Soil Conservation District and Maryland Department of Agriculture (MDA) moved from their old location in the Court Square Building.

The Ag Center is a new 12,000 square foot brick building owned by the Soil Conservation District. The current tenants are the District, MDA, USDA Natural Resources Conservation Service, USDA Farm Service Agency, St. Mary's County Farm Bureau, and the Southern Maryland Resource Conservation and Development. The building was planned to also include University of Maryland Extension and the County's Ag and Seafood Division within the next three years.

Please stop by and tour the Center on Tuesday, April 12th between 10:00 a.m. and 2:00 p.m. as part of the open house ceremonies.

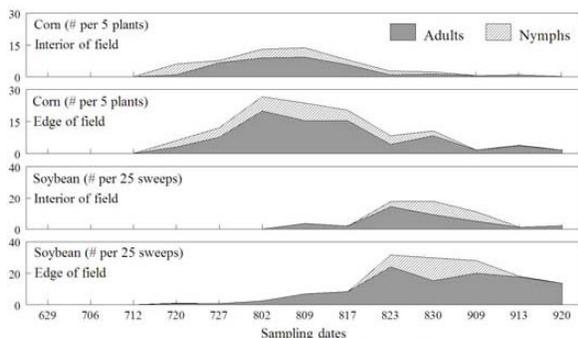


Figure 3. Seasonal abundance of BMSB along the field edge and in the interior of corn and soybean fields. WMREC farm, Keedysville, MD. 2010.

On the Lighter Side

No Breaks for You, Son

A clergyman walking down a country lane on a hot summer day sees a young farmer struggling to load hay back onto a cart after it had fallen off.

"You look hot, my son," said the cleric. "why don't you rest a moment, and I'll give you a hand."

"No thanks," said the young man.

"My father wouldn't like it."

"Don't be silly," the minister said.

"Everyone is entitled to a break. Come and have a drink of water."

Again the young man protested that his father would be upset. Losing his patience, the clergyman said, "Your father must be a real hard liner. Tell me where I can find him and I'll go have a talk with him!"

"Well," replied the young farmer, "he's under the load of hay."

Daffodowndilly

by A.A. Milne

She wore her yellow sun-bonnet,
She wore her greenest gown;
She turned to the south wind
And curtsied up and down.
She turned to the sunlight
And shook her yellow head,
And whispered to her neighbor:
"Winter is dead."



Wishing you a good spring and productive 2011!

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| EQUAL OPPORTUNITY PROGRAMS |
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