

# VIRGINIA Ag Expo EXTRA

2014



## VIRGINIA Ag Expo

**Northern Neck Agriculture –  
400 Years and Still Growing**

**August 7, 2014**

**Gates open at 7:30 a.m.**

**Field tours begin at 9 a.m.**

**Located at Bleak House Farm, Lottsburg,  
Virginia.**

**More than 140 exhibitors and sponsors will be showcasing the latest equipment, technology, goods, and services.**

**Field tours will include:**

- Disease update for soybean and corn.
- Insect pests of soybean and corn.
- Weed control and weed resistance management.
- High-yield soybean management.
- High-yield corn management.
- Safety demonstration for handling bulk seed containers.

**Not on the tour, but open to view, will be Frederick Downing's collection of vintage farm tractors.**

**There is no charge to attend the expo and no need to preregister.**

**Breakfast and lunch will be available from 6:30 a.m. until 2 p.m. Local civic organizations and food truck vendors will offer a wide array of items, including barbecue, seafood, chicken, hamburgers, hot dogs, and complete dinners.**

**For those using GPS for directions to reach the expo, enter the following address into your system: 662 Bleak House Farm Lane, Lottsburg, VA 22511.**

**The Virginia Ag Expo is a joint project of the Virginia Grain Producers Association and the Virginia Soybean Association, in partnership with Virginia Cooperative Extension.**

**For more information, contact the Virginia Grain Producers Association at 804-726-6022 or the Virginia Soybean Association at 804-466-1693.**

**Dear Agriculture Enthusiasts,**

On behalf of Virginia Cooperative Extension and our partners, the Virginia Grain Producers Association and the Virginia Soybean Association, I would like to invite you to attend the 2014 Virginia Ag Expo taking place August 7 at Bleak House Farm in Lottsburg, Virginia. We are proud to be part of this premier agricultural event.

The Ag Expo is being held in Virginia's Northern Neck, and the 2014 theme, "Northern Neck Agriculture – 400 Years and Still Growing," reminds us of the important role agriculture has played in Virginia's history and its ongoing status as the commonwealth's largest industry.

This year also marks the 100-year anniversary of the Smith-Lever Act, which established the national Cooperative Extension System. Early farm demonstration work consisting of face-to-face instruction and practical demonstrations in agriculture and home economics laid the foundation for today's Extension service. Ag Expo allows us to continue Extension's important outreach function as we deliver knowledge from Virginia's two land-grant institutions — Virginia Tech and Virginia State University — to farmers and agricultural enthusiasts gathering from across the commonwealth.

Ag Expo provides an ideal opportunity to highlight the latest technology in crop production and current research findings from faculty members in the College of Agriculture and Life Sciences, the Virginia Agricultural Experiment Station, and Virginia Cooperative Extension.

More than 140 exhibitors will also be on hand to showcase and demonstrate products and services that can help producers continue to succeed. We encourage you to check out the latest models of tractors and sprayers and compare seed varieties, fertilizers, and crop production products.

We would like to thank the Downing family for hosting this year's Ag Expo and for sharing their Virginia Century Farm with us.

We hope you can join us for the day, enjoy the Expo, and take home a wealth of information you can use in your day-to-day farming operations.

Sincerely,

Ed Jones, director  
Virginia Cooperative Extension



Ed Jones



# Ag Expo Host: Bleak House Farm

Bleak House Farm is owned by the Frederick J. Downing family. It is situated on the banks of the Glebe Creek branch of the Coan River in Northumberland County, Virginia, with a view into the mouth of the Potomac River all the way to Point Lookout, Maryland.

The farm has been in the same family for close to 200 years and has earned the designation of Century Farm. The original farmhouse burned down in the 1800s. It was rebuilt in 1841 and is currently owned by Frederick's brother, William H. Downing, and his family.

After the death of his father, Homer Downing, Frederick and his wife, Ellen, assumed the management of the farm operation. At that point, the farm consisted of 102 acres of workable land. In 1976 they purchased the adjacent farm known as Wheatland. In subsequent years they purchased additional farmland, which together with rented land, has resulted in a farming operation of more than 2,400 acres. In addition to acquiring more farmland, Frederick changed the focus of the farm from vegetables and livestock to small grains.

Every nuance of farming excited Frederick Downing. He was an avid collector of antique tractors that he restored with loving care. He was also responsible for helping found the Antique Tractor Club and the annual antique tractor pull at the Callao Ruritan Recreation



Park. His sons Michael and Mark have preserved all of his hard work. As you wander around Bleak House Farm, you'll still find the majority of his fully restored tractors.

Sadly, Frederick passed away in 2001. Today, his wife, Ellen, and sons Michael and Mark preside over the day-to-day management of the farm, raising barley, wheat, corn, and soybeans. They also do custom field operations and hauling.

The Downing family cordially invites you to the 2014 Ag Expo at Bleak House Farm and hopes you enjoy the farm and the day.

## Be Proud of U.S. Soy's Sustainability Performance

Customers have different demands for U.S. soy, but one demand that many customers have in common is soybeans grown in a sustainable manner. The National Soybean Checkoff Program decided to demonstrate why U.S. soy and the farmers who grow it should already be considered sustainable.

The Checkoff Program and other farmer-led U.S. soy organizations recently adopted the U.S. Soy Sustainability Assurance Protocol, which outlines the regulations, processes, and practices that define U.S. soy production as sustainable. A related guide introduces farmers to the protocol: <http://soygrowers.com/wp-content/uploads/2013/02/US-Sustainability-Assurance-Protocol-March-2013.pdf>.

Because so many customers demand responsibly sourced materials, farmers can consider sustainability a way to ensure that U.S. soy demand stays strong. The Checkoff Program and its partners — such as the U.S. Soybean Export Council and American Soybean Association — continue to use sustainability information in marketing efforts, but farmers can help spread the word, too. For example:

- Soil erosion per bushel of soybeans is down 66 percent since 1980.
- Soybean yields have increased by 55 percent in the last 30 years, using fewer inputs and less water.
- Ninety-eight percent of all the farmers who are subject to review are in compliance with USDA conservation standards.

These are great facts for customers to know. Learn about these nuggets and many more in the easy-to-read sustainability guide. Reference the information when talking to other farmers about the importance of sustainability. Share it through social media channels. And tell nonfarming friends about how U.S. soybean farmers are responsibly raising their crops.

The data show U.S. soybean farmers employ sustainable practices. Be proud of it!

## Want to Know More?

For more information about what the Checkoff Program is doing to promote U.S. soybean farmers' sustainable farming practices, check out the "Sustainability Message Guide" at [http://www.unitedsoybean.org/wp-content/uploads/USB\\_MessageGuide\\_Final\\_High\\_Com3.pdf](http://www.unitedsoybean.org/wp-content/uploads/USB_MessageGuide_Final_High_Com3.pdf).

## The College of Agriculture and Life Sciences Alumni Organization

*All Virginia Tech alumni and friends are invited to enjoy a fun-filled evening of good wine, good food, and good company with fellow Hokies.*

Special presentation on the Virginia wine industry by Cain Hickey, Doctoral Candidate, Department of Horticulture, Alson H. Smith Jr. Agricultural Research and Extension Center

With college and Extension updates from Alan Grant, Dean, College of Agriculture and Life Sciences  
Bobby Grisso, Associate Director, Virginia Cooperative Extension

**Wednesday, August 6, 2014**

**5:30 p.m. Reception and wine tasting**  
**6:30 p.m. Dinner**  
**7:30 p.m. Program**

### Good Luck Cellars

1025 Good Luck Road  
Kilmarnock, VA 22482  
[www.goodluckcellars.com](http://www.goodluckcellars.com)  
\$35 (21 and older) • \$30 (13 - 20) • \$25 (6 - 12) • Free (5 and younger)  
Food by Willaby's Catering

Register online at <http://bit.ly/calsalumniaug6>.

If you have questions or need assistance with registration, please contact Jamie Lucero, director of alumni relations, at [jlucero@vt.edu](mailto:jlucero@vt.edu) or 540-231-9666.

Visit our booth at the Virginia Ag Expo on Thursday, Aug. 7.

 **VirginiaTech**  
College of Agriculture and  
Life Sciences

**Alumni**  
Organization



Frog-eye leaf spot on soybean

# Do Foliar Fungicides Pay in Soybean and Corn?

Hillary L. Mehl, Extension Plant Pathologist, Tidewater Agricultural Research and Extension Center, and Assistant Professor of Plant Pathology, Physiology, and Weed Science

Over the past decade a variety of factors — including increased market prices for corn and soybean, actual and perceived disease threats, and the availability of new fungicide products for disease control and “plant health benefits” in corn and soybean — have prompted growers to invest more in protecting their yields. However, increased yields are typically realized less than 50 percent of the time (fig. 1).

So when are fungicide inputs worth the additional cost and effort? An integrated pest management approach to fungicide applications is one tool that can be used to increase the profitability of crop production while minimizing environmental impacts. Here are six points to consider:

- 1. How susceptible or resistant is your cultivar?** Varieties have a high turnover rate, so check with your local Virginia Cooperative Extension office or seed dealer for current information on which varieties have some level of resistance to diseases in the region.
- 2. Yield potential: What are you protecting?** If yield potential is low, you do not have much to gain, and fungicide applications are unlikely to be profitable.
- 3. Crop growth stage and timing of fungicide applications** – Diseases are more likely to impact yield at particular growth stages of the crop (typically during development of the grain), so timing fungicide applications accordingly is key.
- 4. Previous crop and cropping system (for example, no till)** – Many pathogens are able to survive on crop residues. Keep in mind that some diseases overwinter on crop debris in Virginia (for example, frog-eye leaf spot and gray leaf spot), whereas others require a living plant host and must move in from warmer regions each year (for example, Asian soybean rust and southern corn rust).
- 5. Disease pressure** – Which diseases, if any, are present and how widespread are they? Scouting and accurate pathogen/pest identification are critical components of any integrated pest management program.
- 6. Weather** – Temperature and humidity greatly influence the onset and development of disease. Even if the crop is susceptible and a pathogen is present, the risk of yield loss to disease may be low if environmental conditions are not conducive to pathogen growth and reproduction. Warm, humid conditions are favorable for many diseases in our region.

Based on this final point, we are currently developing a weather-based disease advisory model for timing of foliar fungicide applications in soybean. Based on seven years of prior data, weather parameters conducive to the development of soybean diseases have been identified (table 1). Starting this summer, we will be validating and further optimizing this model and evaluating the profitability of different fungicide spray schedules based on yield response and input costs. Ultimately, we hope to develop a Web-based disease advisory alert system for soybean and, eventually, for other crops, including corn.

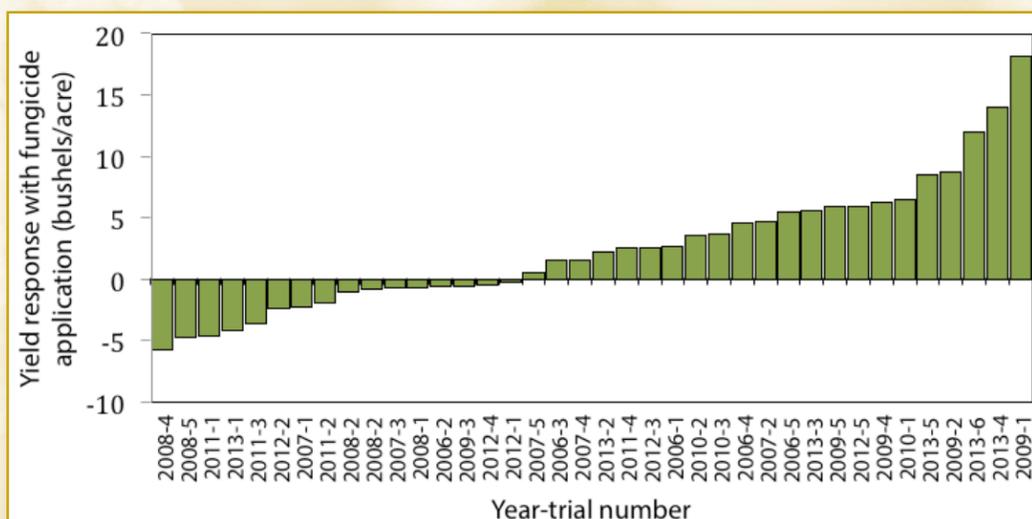


Figure 1. Soybean yield responses to fungicide applications in trials conducted at the Tidewater AREC, 2006-13. Yield increase in approximately 50% of trials. Statistically significant yield response one-third of the time. Average yield response = 2.2 bushels/acre (\$28/acre based on 2013 value).

Table 1. Relationship between soybean yield responses to fungicide applications and weather conditions conducive to foliar disease development (Tidewater AREC, 2006-13).

| Favorable days (R3-R6) <sup>a</sup> | Average response to fungicide application |                   |                       |
|-------------------------------------|-------------------------------------------|-------------------|-----------------------|
|                                     | Yield (bushels/acre)                      | % disease control | % reduction leaf drop |
| 0 to 5                              | -3                                        | 40                | 33                    |
| 6 to 15                             | -1                                        | 61                | 38                    |
| >15                                 | 4 <sup>b</sup>                            | 68                | 51                    |

<sup>a</sup> Daily average temperatures between 65 and 78 °F and 10 or more hours per day of >95% relative humidity when soybean was between growth stages R3 (beginning pod) and R6 (full pod).

<sup>b</sup> 4 bushels/acre response = \$50/acre; maximum response was 8 bushels/acre (\$100/acre).

# Virginia Ag Pest Advisory Gets a Face-Lift

Ames Herbert, Extension Entomologist, Tidewater Agricultural Research and Extension Center, and Professor of Entomology

The Virginia Ag Pest Advisory system has been delivering time-sensitive crop pest updates to Virginia farmers and agriculture industry representatives for more than 15 years. Prior to the advent of the advisory, information was primarily being sent to growers via newsletters, which was not very efficient. For the information to be helpful, the user needs to receive it as quickly as possible.

Under the guidance of Ron Stinner, who at that time was director of the Southern Region IPM Center in Raleigh, North Carolina, a system was developed whereby our Virginia Tech/Virginia Cooperative Extension entomologists, plant pathologists, and weed scientists created short updates during the week. All of the updates were collected, and the list was emailed once a week to more than 350 growers, agricultural industry representatives, Extension agents, and other faculty members across the state and region. The updates were tagged by author, short title, pest group (insects, weeds, or diseases), and commodity (potatoes, cotton, vegetables, peanuts, etc.) so the email recipients could select only those updates that were most relevant to them.

Over the years, this advisory has provided subscribers with in-season, real-time pest alerts; pest survey results; the status of emerging and migrating pests; pesticide resistance issues; notifications of pesticide labeling changes; and reminders of economic thresholds, sampling procedures, and best management recommendations.

Many users have become accustomed to checking this advisory before beginning their week so they will be better prepared for whatever might be needed to protect their crop. Although a formal feedback assessment was never undertaken, if the advisory ever hit a glitch and failed to go out (which happened from time to time), the many emails and phone calls we got let us know how many folks had come to rely on the information. We have received many comments over the years about the value of our advisory, and the email recipient list continues to grow.

However, what was once cutting-edge now needs a face-lift. With the many advances in information technology, there are more efficient ways of delivering this information. The new and improved Virginia Ag Pest Advisory will still offer the same features of the old system — weekly email alerts, for example — but it will also allow users to subscribe to an RSS feed. Information will still be tagged by topics, commodities, and author, which will allow users to quickly find previously posted information. The new system will be much easier for authors to use as well. It will be simpler for them to post information, and it will allow for more photos and other media, such as videos. Each advisory will also have a unique website URL to make bookmarking and sharing easier.

If you are a current user, you will automatically begin receiving the new Virginia Ag Pest Advisory. If you are not currently receiving the advisory and would like to, visit <http://blogs.ext.vt.edu/ag-pest-advisory> to subscribe to the weekly email or RSS feed. If you have any comments or suggestions about the new Virginia Ag Pest Advisory system, please contact Ames Herbert at [herbert@vt.edu](mailto:herbert@vt.edu) or call 757-657-6450.



# On-Farm Test Plots Evaluate Corn Production Practices

Keith Balderson, Extension Agent, Agricultural and Natural Resources

Wade Thomason, Extension Grains Specialist and Associate Professor of Crop and Soil Environmental Sciences

For the past 23 years, the Virginia Corn Board has provided funding to area Extension agents to evaluate corn production practices through a series of on-farm plots planted in cooperation with farmers and agribusiness personnel. In addition to hybrid demonstration trials, the plots have evaluated such practices as deep tillage, nitrogen injection, slug management, fungicide use, and others.

The objective of the project is to provide farmers and agribusiness personnel with results from large, on-farm replicated studies that help farmers produce maximum economic corn yields.

Results from the plots are documented annually in a numbered Virginia Cooperative Extension publication and posted to the VCE website ([www.ext.vt.edu](http://www.ext.vt.edu)). About 500 hard copies of the publication are distributed to corn producers and agribusiness personnel.

During the past three years, variable rate nitrogen applications to corn have been a significant part of the project. The plots have consisted of three treatments:

1. A fixed rate of sidedress nitrogen determined by the farmer's yield goal and nutrient management plan.
2. A variable rate of sidedress nitrogen based on yield zones.
3. A variable rate of sidedress nitrogen based on Greenseeker (sensor-based) technology.

Nitrogen is very important in producing a profitable corn crop. The grain in a 150-bushel-per-acre corn crop removes 135 pounds of nitrogen. In addition, nitrogen is very mobile in soils and — with the exception of the pre-sidedress nitrate test used with organic nitrogen sources — there is no soil test for making nitrogen recommendations. Moreover, nitrogen is a significant expense in corn production, currently costing as much as \$100 per acre. Nitrogen is also one of the nutrients responsible for algal blooms in the Chesapeake Bay and its tributaries.

Improving nitrogen-use efficiency in corn production would offer both economic and environmental benefits. Our plot work in 2012 was limited by extreme drought conditions, but over 2012-13, we were able to harvest four plots. To date, the Greenseeker technology shows some promise in improving nitrogen-use efficiency. Over the four plots, all three treatments averaged about 197 bushels per acre. However, the Greenseeker technology used 10 pounds per acre less nitrogen than the fixed-rate plots, and 15 pounds per acre less than the zone-based, variable-rate plots. All treatments had very good nitrogen efficiencies, but the Greenseeker treatment was the best with 0.846 pound of nitrogen applied per bushel of yield.

The work is being continued this year. We hope these field-size research plots evaluating variable-rate technology will help growers decide if they want to adopt the technology.



## Join VGPA Today!



The Virginia Grain Producers Association is a nonprofit, farmer-run association representing the corn and small-grain producers of Virginia on a variety of issues. VGPA promotes and protects Virginia corn and small-grain producers and provides value to the surrounding industry through our role as an information source, producer advocate, and provider of end-user relations and public outreach.

Your checkoff dollars fund ongoing research and education projects to support and promote corn and small-grain production. VGPA partners with these research facilities, academic institutions, end-users, and other trade and commodity associations to promote production agriculture.

The association has successfully represented Virginia producers on policies and programs that allow farmers to keep their land in production. VGPA's highest priority is securing effective, efficient programs and policies that positively impact Virginia's corn and small-grain producers.

### Join VGPA Today and Receive the Benefits of Membership!

- Promotion of grain production through outreach and education.
- Eligibility for the National Corn Yield Contest and VGPA scholarship.
- Significant member discounts at Cabela's, Enterprise, Dell, Ford, NASCAR, and other partners.
- Increased market opportunities for growers.
- Information resources for growers, industry, and legislators.
- Representation and advocacy on behalf of Virginia's corn, wheat, and barley producers.

Join VGPA today and help enhance and protect Virginia agriculture!  
[www.VirginiaGrains.com](http://www.VirginiaGrains.com)  
[Membership@VGPA.com](mailto:Membership@VGPA.com)  
 804-726-6022

# The Quest for 100-Bushel Soybean

David Holshouser, Extension Agronomist, Tidewater Agricultural Research and Extension Center, and Associate Professor of Crop and Soil Environmental Sciences

At present, Virginia's 20-year trend line soybean yields are about 36 to 37 bushels per acre, which lags behind the national average of 42 to 43 bushels (fig. 1). The lag is largely due to nearly half of Virginia's acreage being planted after wheat harvest in a double-crop system, where soybean yields are lower. It can also be attributed to Virginia's less productive soils, relative to the Midwest. Regardless, when Mother Nature is kind and everything falls into place, soybean farmers in Virginia can yield with the best of best.

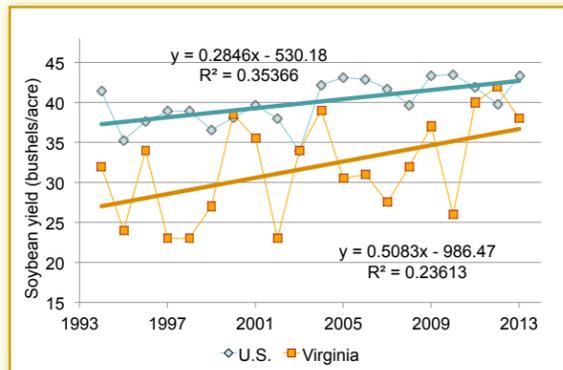


Figure 1. Virginia versus U.S. soybean yield (1994-2013).

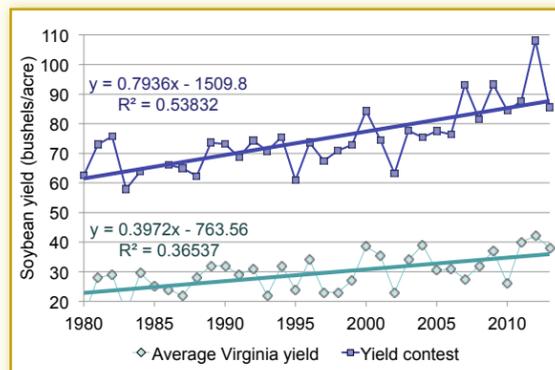


Figure 2. Soybean yield gap in Virginia (1980-2013).

Figure 1 shows average soybean yield. What is the true yield potential in Virginia? Figure 2 shows the top yield from the Virginia soybean yield contest over the last 34 years. The contest yields represent what was possible in that year. Note that Virginia has already exceeded 100 bushels per acre — Keith and Mark Brankley of Mecklenburg County yielded 108 bushels per acre in 2012, a Virginia record. This level of production is far short of the world record of 161 bushels set in 2010 by Kip Cullers of Purdy, Missouri, but it is still a monumental feat. Notice the yield gap between the yield contest winners and Virginia's average yield. A concern is that this gap is widening by about 0.4 bushel per year.

In our quest to get 100 bushels or more of soybean per acre, Mark and Michael Downing of Bleak House Farm, home of this year's Virginia Ag Expo, are leading the way. In the annual contest, sponsored by the Virginia Soybean Association and Virginia Cooperative Extension, the brothers have both achieved more than 60 bushels (in 2008 and 2009, respectively), and Michael yielded 93.9 bushels in 2009 — a state record that held until the Brankleys bested it in 2012. Every year, they strive to break their old records and become the second Virginians to get past the century mark.

Recently, I spoke to Michael Downing about the goal of 100 bushels per acre. Following are his answers to some of my questions. Note that I am paraphrasing Michael's responses; these are not his exact words.

## Q: Why such an interest in soybean?

**A:** When I first started, my job was to plant the soybean, and I took great pride in getting a good stand. I soon recognized that soybean had much more yield potential than others were giving the crop credit for. By giving the crop the attention it deserves, yields can be really good.

## Q. There seems to be more interest, nationally and in Virginia, in the corn yield contest. Why do you focus on the soybean yield contest?

**A:** I grow corn and I, too, want to get as much yield from that crop as possible, but it's too hit-or-miss. It's very hard to push corn yields on our Northern Neck soils. But soybean is different; you can push those yields. Soybean is tougher and more resilient than corn, and the crop is much more profitable, year in and year out.

## Q: What are your standard production practices in soybean?

**A:** First, I'm constantly changing and trying new things. So my standard practices are constantly evolving. But

at the moment, my goal is to have all of my full-season soybean planted by mid- to late-April. I've found this to be a key for good yields. I plant a mid-maturity group IV, Roundup-Ready/STS variety at 125,000s seed per acre. Because I'm planting in April, I treat the seed with both fungicide and insecticide and also with an inoculant. Many farmers would leave the inoculant out, but we've seen it occasionally increase yield and, over time, it pays for itself many times over. It's a very good insurance treatment that ensures the crop is fixing all the nitrogen it needs. I also include a 2-inch by 2-inch band of 15-15-0-5 (N-P-K-S) with zinc starter fertilizer on about 50 percent of our acres, which is planted in wide, 30-inch rows. I'm not sold on the starter yet, but we've seen responses. Nor am I sold on 30-inch rows for full-season soybean. In some years, the 30-inch beans with starter will out-yield the drilled beans (without starter); in other years, the drilled soybean wins. Still, the starter is something I want to continue to evaluate.

I am very adamant about good weed control. I use pre-emergence herbicides with several modes of action and spray postemergence when weeds are small. This not only

helps prevent weed resistance, but I'm certain that my yields are higher because of it. Typically, I spray Roundup, Authority MTZ, and Prowl preemergence (that's four different mechanisms of action) and follow that up with Roundup and Synchrony (that adds one more mechanism of action). Therefore, weeds are not a problem. To prevent any nutrient deficiency, I include a foliar feed with my herbicide spray and again with a foliar fungicide that is applied after pods begin to form. I don't want the crop to have any nutrient stress. I think the foliar fungicide is very important in keeping yield potential high. In addition, we scout for various insects and spray if needed.

## Q: Do you do anything different with your yield contest plots?

**A:** Yes, of course. I usually designate about four or five different places on the farm for this. Here, I'll try new things and keep on trying things that I think may have worked in the past. All of these plots are planted in April, some in 30-inch rows with a starter fertilizer and some that are drilled. The foliar feeding and fungicide is usually included. We have had SDS [sudden-death syndrome] in our yield contest plots and throughout the farm when the soybeans are growing well. I've found that a timely fungicide application after we first start seeing the symptoms keeps the SDS from spreading farther. In addition, we're experimenting with a sidedress of 20 gallons of 15-15-0-5 with zinc around the first of June in our 30-inch row soybean. We've done this for the last three years but cannot yet confirm whether this helps or not. I'm definitely not sold on this practice.

## Q: What have you learned?

**A:** Early planting pays. Treating the soybean seed with fungicide, insecticide, and inoculant is well worth it. Don't let the soybean experience stress. This means taking care of them. Moreover, you can't take care of them unless you regularly walk the fields, every three to four days.

## Q: Any parting words of advice?

**A:** Walk your beans if you want them to yield. Stay on top of them. Don't let them stress.

I am truly impressed by the drive shown by Michael and Mark to improve themselves and their farm and also by their desire to learn and do things better. Although many of Michael's practices are not in my list of recommendations, they may be one day. Regardless, it has been a pleasure to work alongside the Downings this year. I think that everyone is benefitting.

Along with this theme of economically increasing soybean yields, we have established some maximum economic yield plots at the Downing farm. The plots are set up in an omission treatment structure, where the "maximum input" plot includes 15-inch versus 30-inch rows, chicken manure, starter fertilizer, controlled-release nitrogen, inoculant, and a foliar fungicide. The other plots contain all of these treatments minus one of the inputs. From this, we hope to discern which inputs are making the biggest impact.

In addition, there will be soybean variety, fertility, foliar fungicide, and insect control plots. There will be lots to see in both soybean and corn. I look forward to the Ag Expo and the results coming from our plots, and I hope to see everyone there.



# Tidewater Agricultural Research and Extension Center Celebrates 100 Years

Amy Loeffler, Office of Communications and Marketing, College of Agriculture and Life Sciences, Virginia Tech

The Tidewater Agricultural Research and Extension Center sits on 336 acres in Suffolk in the coastal plains region of Southeast Virginia. It was established on April 6, 1914, and celebrates, along with Virginia Cooperative Extension, its 100-year anniversary in 2014.

The facility itself had humble beginnings. It was started with one person, 20 acres of rented land, a tiny white-frame two-room building, and a mule.

Applied research and Extension education programming at the Tidewater AREC is focused on economically important field crops, such as cotton, soybeans, peanuts, corn, small grains, and alternative crops, and on commercial swine production. The Tidewater AREC's Field Tour on September 11, 2014, will allow the public and other interested parties to see firsthand how the AREC conducts valuable research and the importance of its mission to the state.

Plant- and crop-focused research efforts are directed at real-world agricultural problems that seek to improve disease management. For example, peanuts — a top agricultural export in the commonwealth in 2013 — are susceptible to sclerotinia blight, a common fungus that can be devastating to peanut crops and costly to treat. Researchers are in the process of developing cultivars of peanuts that are genetically resistant to the blight, leaving more money in farmers' pockets.

Fungus also attacks another one of Virginia's superstar exports: soybeans. Hillary Mehl, assistant professor of plant pathology, physiology, and weed science, studies if and when fungicidal applications should be administered to soybeans and if their application is economically beneficial.

"We are currently developing and validating a weather-based advisory for timing applications of fungicides for control of foliar diseases in soybean," said Mehl. "Ultimately, this will allow growers to forgo fungicide applications when they are not needed and optimize application timings when they are needed to protect yield."

Pork is another top export of the state, and animal scientists at the Tidewater AREC address issues in commercial swine production, including controlling excess nutrient excretion and waste management techniques to minimize the potential for negative environmental impact. Swine physiologists are developing management and nutritional approaches for improving swine fertility in artificial insemination programs used on commercial hog farms.

"At the Tidewater AREC, we are investigating how the management of young gilts (female swine before producing their first litter) impacts future reproduction and longevity in the breeding herd," said Mark Estienne, professor of animal and poultry sciences. "The swine industry in Virginia is very diverse and includes large corporate farms producing commodity pork as well as small independent farms producing pork for local consumers. Our research is designed to help farmers at both ends of this spectrum produce pork in a profitable and sustainable manner."

The success of research performed at the ARECs is often quantified in dollars, but Mehl's research on Virginia's top crops is its own reward. "Having the ability to conduct research at the AREC that has a direct, immediate impact on agriculture is an extremely satisfying career," she said.

To learn more about Virginia's agricultural research and Extension centers, visit [www.vaes.vt.edu/arecs](http://www.vaes.vt.edu/arecs).



## 2014 Preharvest Field Tour at Tidewater AREC – September 11, 2014

The preharvest field tour at the Tidewater AREC in Suffolk is an annual event that spotlights research in Virginia's major agricultural field crops. The 2014 tour will focus on agronomic, physiological, and crop protection research in cotton, soybeans, peanuts, sorghum, and corn. Research highlighted will include fungicide use and disease management in row crops; soil fertility issues in cotton and soybeans; variety evaluation in cotton, soybeans, peanuts, and sorghum; and in-season management of insect pests in row crops.

Those who attend the field tour generally include researchers, industry personnel, and producers, but the general public is also welcome to attend. This year marks the 100-year anniversary of Virginia Cooperative Extension as well as the 100-year anniversary of agricultural research at the Tidewater AREC. There will be a luncheon and celebration to honor the faculty and staff members who have served at the AREC, as well as the introduction of the new director, David Langston. Langston is currently a professor of plant pathology at the University of Georgia-Tifton; he begins his new role at the Tidewater AREC on August 15.

Please join us September 11. Registration begins at 7:30 a.m. with tours starting at 8 a.m. and concludes with lunch. For more information, contact Hunter Frame, Extension agronomist, at [whframe@vt.edu](mailto:whframe@vt.edu) or call 757-657-6450.



## Join the Virginia Soybean Association Today!

The Virginia Soybean Association is soybean farmers' voice in Richmond and in Washington, D.C. By joining the VSA, you also gain membership to the American Soybean Association.

VSA and ASA leadership is made up of soybean farmers like you. You may not have time to take a trip to see your representatives, but your membership helps grower-leaders educate federal and state policymakers, which can help influence important decisions that drive profitability on your farm.

Membership in VSA and ASA provides additional benefits, too. These include leadership development for grower-leaders and scholarship opportunities for college students. ASA also partners with Ford, Chrysler, and Cabela's to offer discounts to members.

*If you believe, belong.*



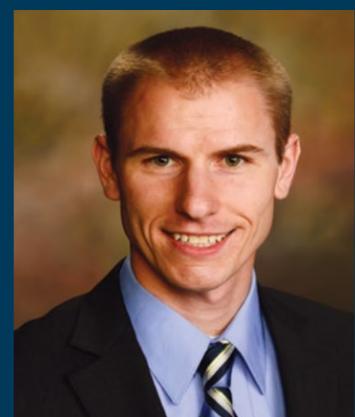
### The mission of the Virginia Soybean Association is:

To serve the Virginia soybean farmer and consumer by bringing educational, environmental, and economic value to our industry.

With fewer farmers growing soybean each year, it has never been more important to make sure that sound policies are in place to enhance the future of soybean farming. Visit the VSA booth at Virginia Ag Expo to join today!

## Flessner Joins the Department of Plant Pathology, Physiology, and Weed Science

Michael L. Flessner will join the Department of Plant Pathology, Physiology, and Weed Science in August as an assistant professor and Extension weed science specialist. He comes from Auburn University where he most recently served as a research associate in the Department of Crop, Soil and Environmental Sciences. He is the author of 14 referred journal publications and 38 abstracts. He is a member of the Crop Science Society of America, the Weed Science Society of America, and the Southern Weed Science Society. Flessner received his Ph.D. in crop, soil and environmental sciences and his master's degree in agronomy and soils from Auburn University; and he earned a bachelor's degree in plant sciences from the University of Tennessee. Flessner plans to be on hand at the Ag Expo to introduce himself to those in attendance.



# The Law of the Minimum Applies to More Than Just Plant Nutrients

Wade Thomason, Extension Grain Specialist and Associate Professor of Crop and Soil Environmental Sciences

**Liebig's Law of the Minimum states that crop growth or yield is not limited by the total amount of resources available to the plant but by whichever resource is in the scarcest supply. If the available amount of that resource is increased, growth will increase until the next resource limitation is encountered.**

Plant nutrients are the classic example for this and the reason why we use soil testing, yield goals, and sometimes even tissue testing to ensure that everything the plant needs is in adequate supply to meet the yield potential that the environment can support. It is extremely important to use all these tools regularly to monitor the crop's nutrient status. It's also important to apply this philosophy to the other essential things a corn plant needs to thrive — mainly water, sunlight, and air.

The plant extracts carbon dioxide from the air, and that carbon is the basic building block for all the plant's cells. We can't really supply more CO<sub>2</sub>, but the rate of carbon captured by the plant is often limited when the crop is under drought stress. Specialized leaf cells that controls the release of water close up to retain that water, but that also means the CO<sub>2</sub> can't enter. It takes adequate water to utilize the CO<sub>2</sub> in the air effectively.

While we often can't control the amount of water (rain) a field receives, we can influence how much of that water is retained in a useful form. Surface residue — either old crop or cover crop — can help slow runoff, improving infiltration. Similarly, that residue can shade and cool the soil and reduce evaporative losses.

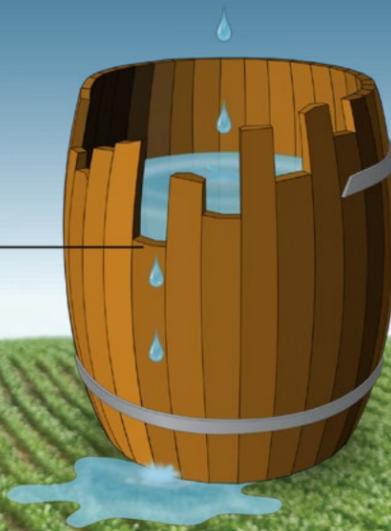
Finally, improving soil organic matter can improve water-holding capacity and increase infiltration. Sunlight is most abundant in Virginia during the summer, but it doesn't guarantee an efficient conversion of that energy to plant material. Plant populations that are less than optimum don't harvest as much available sunlight as in higher populations. Similarly, corn hybrids with more upright leaves, especially in the upper canopy, can be planted closer together without sacrificing light interception. Anything that reduces leaf area hurts this conversion as well, so plants should be protected from damaging levels of insects and diseases in order to operate as efficiently as possible.

There are numerous soil-related factors at work as well. Corn root access to nutrients and water can be limited due to compaction or restrictive layers, so it's important to diagnose these issues in a field-specific manner. There is evidence that improving overall soil health can help improve crop productivity. In addition to the documented physical and chemical factors associated with healthy soils, there is a biological component that is finally receiving its share of attention. Understanding these interactions may help unlock future productivity increases.

Achieving the best possible corn yields and using inputs efficiently involve a careful assessment of what the limiting factors are in each field, each year, and managing to minimize their occurrence.

Liebig's law of the minimum. (2014, May 25). In Wikipedia, The Free Encyclopedia. Retrieved 20:17, July 2, 2014, from [http://en.wikipedia.org/w/index.php?title=Liebig%27s\\_law\\_of\\_the\\_minimum&oldid=610116352](http://en.wikipedia.org/w/index.php?title=Liebig%27s_law_of_the_minimum&oldid=610116352)

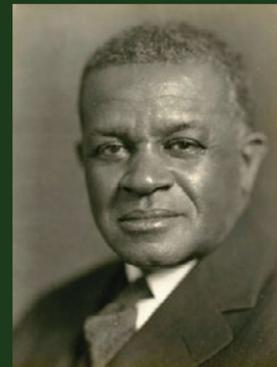
Minimum



## Pioneers of Virginia Cooperative Extension: Pierce and Sandy Pave the Way

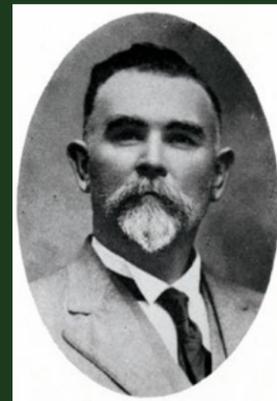
Sara Lepley,  
Office of Communications and  
Marketing, College of Agriculture  
and Life Sciences, Virginia Tech

The first two Extension agents in Virginia were John B. Pierce and T.O. Sandy — men who made the idea of teaching agriculture through demonstration work a reality in the commonwealth. They were handpicked to start farm demonstration work before Extension officially existed under the Smith-Lever Act of 1914.



John B. Pierce

In 1906, H.B. Frissel — president of Hampton Institute and the person who brought the idea of demonstration work to Virginia — asked Pierce to serve black farmers in the state. Later, in 1964, Extension would desegregate its work force. At the time, however, Pierce led the black farmers using resources at Hampton Institute, while Sandy led the white farmers using resources at Virginia Polytechnic Institute.



T.O. Sandy

Pierce had been working as a biology teacher and school gardener at Hampton Institute. He grew up in a household that valued education and earned his undergraduate and graduate degrees at Hampton Institute, along with formal training at Tuskegee Institute.

Pierce's first assignment as an agent was in Gloucester County, where he helped farmers revitalize their poor-quality, sandy soil into soil that could be used for growing a variety of produce. Before long, Pierce was directing agents in the region that encompasses Virginia, North and South Carolina, West Virginia, Kentucky, Maryland, Tennessee, Arkansas, Delaware, and Missouri.

Pierce was known as the "live-at-home crusader" because of his implementation of the live-at-home program. The program emerged during the Great Depression and encouraged farmers to raise edible crops so they could make larger profits, feed their families and livestock, and improve their standards of living.

Sandy was enlisted by Seaman Knapp, who invented the concept of Extension, to carry out the first farm demonstration in 1906. Sandy's previous experience with applying modern agriculture methods to his own farm made him well-suited for demonstration work. Knapp was so impressed with Sandy's first demonstration that he appointed Sandy the state agent for Virginia in 1907. Farmers have hailed Sandy as the "father of farm demonstration."

Sandy surrounded himself with assistants whom he could trust to do a good job. For example, he hired Southall Farrar, who started Virginia's first corn clubs in 1908, as well as Ella Agnew, who headed the girls program and formed the tomato clubs as the first female home demonstration agent in the nation.

Sandy also contributed by finding funding for his projects. For example, in 1908 Sandy worked with J.D. Eggleston, president of what was then Virginia Polytechnic Institute, to secure a \$3,000 appropriation from the Virginia Senate to fund girls' and boys' clubs — the precursor to 4-H. Eggleston is quoted in "Extension Work in Virginia, 1907-1940: A Brief History," co-authored with J.R. Hutcheson (1941), as saying, "T.O. Sandy's usefulness to Virginia ranks among the foremost. Among the good and great of the alumni of the Virginia Polytechnic, I make bold to say that not one surpasses him. He had rare common sense; a finely poised judgment; a passion to be of service."

Pierce and Sandy advanced demonstration and Extension work in Virginia through their sound leadership and hard work. Without them, Virginia Cooperative Extension would not be what it is today.

**Bonus Online Content:**  
Virginian archives world record corn yield through hard work and innovation.  
[www.anr.ext.vt.edu/ag-expo/](http://www.anr.ext.vt.edu/ag-expo/)

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