What’s new?

USDA Agricultural Research Service (ARS) scientists have discovered a potential biological control for red imported fire ants (*Solenopsis invicta*). This virus technology is available for licensing from the USDA. They are currently seeking partners to develop methods for growing and packaging the virus commercially, and for testing it under field conditions. The massive colonies of these fire ants can cause severe economic problems from crop losses, damage to farm and electrical equipment, and accelerated soil erosion. They also pose a severe threat to humans and animals vulnerable to the ants’ sting. Also, these ants could be particularly problematic in Pick-Your-Own operations. Customers will remember the fire ant experience long after they remember getting out to the farm to harvest their own fruits or vegetables!

ARS scientists in Gainesville, FL have found a virus called *Solenopsis invicta* virus-1, or SINV-1, which occurs in about 20% of fields with red imported fire ant colonies; it appears to cause the slow death of infected colonies. ARS entomologist Steven Valles and his colleagues in the Gainesville unit want to find and exploit disease-causing microbes that could be used to control troublesome insect pests. The development of the SINV-1 technology is still in its early stages, but it is the first confirmed virus to be recovered from red imported fire ants.

In the laboratory, SINV-1 has shown promising results. Once introduced to a colony of fire ants, it can kill that colony within 2-3 months. Therefore, the Gainesville researchers would like to cultivate and develop this virus into a viable biopesticide for controlling *S. invicta*.

If this virus can be incorporated into attractant baits for fire ants, it could be a valuable tool for the control of these pests and we can all harvest our vegetables fire ant worry-free. Until that time, we will have to rely on more conventional methods for fire ant control, such as those found at the UT website for Agricultural Fire Ant Control: [http://fireants.utk.edu/Webpages/Agricultcontrolpage.htm](http://fireants.utk.edu/Webpages/Agricultcontrolpage.htm).


Imported Red Fire Ants
Photo from USDA-ARS
On the Farm: Pre-Season Maintenance

The April 2007 issue of Spudman has an article on maintenance of irrigation equipment, while the article focuses on potatoes, the importance of irrigation and maintaining your system is universal—no matter what crops you grow or what type of irrigation you use. With rising energy costs and shrinking water supplies, a little pre-season maintenance can mean more money in your pocket at the end of the season.

Proper irrigation system design and maintenance are crucial to producing a quality crop. As Howard Niebling states in the article, “A good pre-season maintenance program can reduce pumping costs, increase water application uniformity and allow adequate watering of a larger portion of a field with less total water applied.” However, a huge benefit that growers do not always immediately think of may be reducing the disease potential due to fewer and smaller areas of chronically wet or dry soil. “Potential for several economically important potato diseases like potato early dying (Verticillium dahliae), early blight (Alternaria solani) and black dot (Colletotrichum coccodes) can be reduced by minimizing plant stress and encouraging uniform, continuous growth with balanced fertility and optimum soil moisture levels. Disease potential for others – pink rot or water rot (Phytophthora erythroseptica) – may be reduced by maintaining good irrigation practices and avoiding waterlogged soils, particularly under the wet central area of center pivots, or for common scab (Streptomyces scabies) by avoiding low soil moisture during tuber set and early bulking with soil moisture kept above 75% available on silt loam soils,” says Niebling. I suspect that the disease problem encountered by many pumpkin growers in Tennessee last year was from exactly the same thing—plant stress due to non-uniform soil moisture. So, what can growers do to avoid the same fate this year? Irrigation equipment manuals, just like your car manuals, may not be the most exciting reading, but they do list maintenance intervals for machine-specific components. Here is more of Howard’s advice for maintaining your system and improving application uniformity:

Required Maintenance
Because most machines are generally designed to meet less than peak mid-season ET, any breakdowns can be costly to crop yield and quality. Potentially more costly losses include increases in potato diseases favored by crop water stress such as potato early dying, early blight and black dot.

Any time the machine is not operating due to mechanical or electrical problems, it falls farther behind in ability to deliver water. “Catching up” to end water stress problems cannot happen until the peak period is over. General requirements such as checking tire condition and air pressure, checking gearbox lubricant levels or changing lubricant, checking alignment mechanisms and electrical connections are a starting point, but a complete maintenance program for each machine should be developed and followed.

Improve Uniformity
In a system with poor application uniformity, about 34% of the field area will be over-watered by more than 3 inches, with an equal area under-watered by the same amount. Only 10% of the field area will receive optimum irrigation. In contrast, a system with high uniformity will over- or under-water only 9% of the field area by more than 3 inches, while 34% of the field will receive optimum irrigation. Difference in potato crop value between these two situations was estimated to be $140 per acre.

Poor system uniformity in pivots and linear-move systems can be caused by plugged or sticking pressure regulators or by nozzles placed in the wrong location. In general, pressure regulators on low-pressure systems have a useful life of about 10,000-14,000 hours (about 5-7 years), depending on the quality of the irrigation water.

As they age, the moving parts within the regulator tend to stick in one position, particularly in water with high levels of dissolved minerals. As a result, the output of a 15 psi regulator may range from 5 to 25 psi, creating bands of over- or under-watering. As strange as it sounds, a significant number of pivots have had nozzles installed in the wrong location. This also produces bands of over- or under-watering. Therefore, taking the time to double check the location of nozzles on a new or re-nozzled system is certainly worthwhile.

For the full-story, ‘Pre-season maintenance can reduce disease potential’ by Howard Niebling, University of Idaho, visit the Spudman website: http://www.spudman.com/pages/arts.php?ns=565.
Question of the Week

Q: What is Attribute™ Insect Protected sweet corn? And is it worth the extra cost for the seed? - D.F.

A: Attribute™ sweet corn is the trade name of Bt corn from Rogers. Bt corn is corn that has been genetically modified with the Bt gene that provides protection against lepidopteran pests (caterpillars, loopers, worms), such as the European corn borer and corn earworm. Bt or Bacillus thuringiensis is a naturally occurring soil bacterium that has been used for insect control by both organic and conventional farmers alike for over 40-years. The way Bt works in the corn is by producing a protein, which when eaten by the earworm and corn borer, damages their digestive system, stops them from eating, and eventually kills them.

The Bt corn produces the Bt protein in its leaves, silks, stalks and ears, so unlike spraying Bt, which only protects the outside leaves, it continues to provide protection once the worms crawl inside the ear and feed. However, Bt sweet corn alone does not ensure insect-free corn. Bt corn specifically targets corn borers and earworms, scouting for other insects and resistant borers and earworms is still required. This can be one more component of a successful IPM program. Nonetheless, sweet corn is a highly sprayed vegetable crop and research at the University of Maryland has shown a reduction in the sprays needed in Bt versus non-Bt varieties. Bt corn does cost more than other varieties ($35-40 more per acre), but this technology can eliminate the need for whorl treatments and reduce silk sprays by as much as 4 applications, resulting in an overall cost savings. Furthermore, the Bt technology can reduce the amount of time growers spend managing insect pests and can reduce their exposure risks of handling other insecticides. Other studies in Maryland demonstrated that Bt corn had no effect on beneficial insects, unlike commonly used pyrethroids that can reduce the beneficial population by as much as 70%. While Bt corn looks promising as a tool in the IPM toolbox, this technology is still relatively new, has not been tested under adverse weather conditions and high insect pressure, and may not be right for everyone. Also, adoption of this technology has been limited by concerns of consumer acceptance of GMOs. But, a recent poll by Purdue University shows consumer attitudes are changing; most say they would eat Bt corn if it lowers their exposure to pesticides.

***Note: While Bt formulations, like Dipel, are organically approved for crop use, use of GMOs is not allowed in organic production.***

For more information on Bt corn, visit: “Does it pay to grow Bt sweet corn?” by Galen Dively, University of Maryland, from the Great Lakes Fruit, Vegetable and Farm Market EXPO at::


Weather Report

If the weathermen are right, it looks like we are in for a few days of thunderstorms and then the thunder clearing out, leaving us with partly cloudy skies the rest of the week. In Knoxville the highs will range from the mid-70’s to the mid-80’s, with lows hovering near 60. On the Plateau, they will see about the same, with a degree or two colder for their highs and lows. Greeneville high temperatures will mostly stay in the 70’s for the week with lows in the mid-50’s. Nashville and Jackson will have high temperatures in the 80’s through the week and lows in the 60’s. This is also a good week to think about weather monitoring on your farm. In this issue, we have already talked about using pest resistant varieties as part of a successful IPM program. Another successful component of your program should include on-farm weather monitoring and forecasting, as disease and insect cycles are directly connected to temperature, precipitation, and leaf wetness. There are many options available to keep up with the weather on your farm, to learn more, read ‘Weather Monitoring Options’ by John Clements, MSU Extension at:

http://web1.msue.msu.edu/berrien/hort/documents/weatherarticle.html

While some of the information is specific to Michigan, the article contains information we can all use and resources for on-farm monitoring equipment.

The first farmer was the first man, and all historic nobility rests on possession and use of land.

–Ralph Waldo Emerson
The vegetable extension program focuses on providing innovations in production practices, aiding in cultivar selection, developing alternative crops, maximizing crop nutrition and flavor, and reducing the use of chemical fertilizers and pesticides for Tennessee growers through research and education.

In this newsletter, we will keep you up to date on the vegetable research being conducted at UT, new advances in production technology, weather, and crops, and also answer your questions.

Upcoming Events

**United Fresh Marketplace**, United Fresh Produce Association, May 5-8, 2007, Chicago, IL
For more information visit [www.freshmarketplace.org](http://www.freshmarketplace.org).

**All Things Organic Conference and Trade Show**, May 5-8, 2007, Chicago, IL

**Fresh-Cut Produce Hands-On HACCP**, May 15-17, 2007, Athens, GA
For details, call 706.542.2574 or visit [http://www.foodprotection.org](http://www.foodprotection.org).

**Organizing A Local Foods Cooperative Workshop**, May 17-19, 2007, Oklahoma City, OK

**North Carolina Potato Association Annual Meeting**, May 21, 2007, Elizabeth City, NC
For details, email Tommy.Fleetwood@ncmail.net.

Contact Vera Ann Myers for more information at verann@xtn.net.


**Summer Celebration**, July 12, 2007, West Tennessee Research and Education Center, Jackson, TN

**National Association of County Agriculture Agents Annual Meeting/Professional Improvement Conference**, July 15-19, 2007, Grand Rapids, MI

**Steak and Potatoes Field Day**, August 7, 2007, Plateau Research and Education Center, Crossville, TN

**International Irrigation Show**, December 9-11, 2007, San Diego, CA
For details, call 703.536.7080 or visit [http://www.irrigation.org](http://www.irrigation.org).

**Tennessee Fruit and Vegetable Association Convention**, December 9-11, 2007, Nashville Airport Marriott, Nashville, TN

If you would like to subscribe or unsubscribe to SPROUTS: Tennessee Vegetable News, please email: awszelak@utk.edu.