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College of Agricultural, Consumer, and Environmental Sciences

Illinois Fruit and Vegetable News

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a newsletter for commercial growers of fruit and vegetable crops



"We are what we repeatedly do. Excellence, then, is not an act, but a habit." Aristotle

Address any questions or comments regarding this newsletter to the individual authors listed after each article or to its editor, Rick Weinzierl, 217-333-6651, weinzier@uiuc.edu. The ***Illinois Fruit and Vegetable News*** is available on the web at: http://www.ipm.uiuc.edu/ifvn/index.html . To receive email notification of new postings of this newsletter, call or write Rick Weinzierl at the number or address above.

In this issue ...

Crop and Regional Reports

In the south and southwest, unseasonably cool temperatures left the southern region during the last full week of August, to be replaced by hot and steamy conditions. Most of the region received 2.5 inches of rain August 23-24, and more was on the way as this update was in preparation. Temperatures on the 25th and 26th were back in the 90's, with heat indices hovering near the 105^{O} F mark.


Upper and lower surfaces of apple leaves infected by cedar apple rust.

Peach season is coming to an end, with many growers in the region already finished with harvest. Only those with late-season peaches are still picking, and most will likely finish in the next two weeks. Early apple harvest continues, and color is good for the southern region because of the extended cool periods of late July through early August. In walking orchards, I have noticed quite a bit of cedar apple rust and the first signs of summer fruit rots.

White rot of apple.

I have received word that FujiMite 5EC, (active ingredient, fenpyroximate), an insecticide from Nichino America, has received Section 3 approval from the EPA for use on pears, apples, and grapes. The insecticide is now labeled for psylla, spider mites, mealybug, and leafhoppers in pears; spider mites, mealybug, leafhoppers, and apple rust mite in apples; and spider mites, mealybug, and leafhoppers in grapes. FujiMite is a mitochondrial electron transport inhibitor, and is considered soft on beneficial insects. The company is hopeful that the label will be available by February 2005.

I got my first look at the primocane bearing blackberries at the University of Missouri Horticulture and Agriforestry Research Center. "Prime-Jim™" and "Prime-Jan™" are thorny varieties developed at the University of Arkansas Division of Agriculture. The floricanes produce berries in early June, and the primocanes produce fruit beginning in mid-July and continuing until frost. Both are heat sensitive, as hot weather has been shown to reduce fruit set, making them better suited for moderate climates. The berries on the plants I saw were quite impressive, especially with all the recent cool weather. Like other thorny varieties, these varieties do not store well, making them more suitable for home gardens and on-farm sales. These plants will be available this fall, and a list of licensed propagators can be found at:

http://www.aragriculture.org/horticulture/fruits_nuts/Blackberries/licensedprop.asp

Primocane-bearing blackberry.

The 2004 Peach, Plum, and Early Apple Showcase is scheduled for September 8th in Lawrence, Mich. This is a great opportunity for growers to see new and upcoming tree fruit varieties. For more information, call Summit Sales at (269) 674-8866 or Bill Shane at MUS-Extension (269) 944-1477 ext. 205.

For those interested in pumpkin production, the Second Annual Pumpkin Field Day will be held at the St. Charles research Station on Thursday, September 9th. The program will start at 9:30 and is expected to end at 4:30. UI Extension specialists and educators will be available to discuss all aspects of pumpkin production including pest management, nutrition, and variety selection. The station is located at 535 Randall Road, St. Charles, IL 60174. Use this address on www.mapquest.com for detailed driving directions.

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In northern Illinois, cloudy days with day temperatures in the upper 60s to low 80s, and night temperatures in the upper 40s to low 60s characterized the period from August 10 to 26. Northernmost counties received about 0.6 inches of rain in this period, and growers had to irrigate their fields, while some parts of Kane, Cook, and Lake Counties received about 1 inch, and areas to the west around the Quad Cities received about 3 inches. More than 5 inches of rain fell in the Kankakee area during this 2-week period.

Orchardists are continuing with summer spray programs to control apple scab, fruit rots, sooty blotch and flyspeck, powdery mildew, aphids, codling moths, Japanese beetles, apple maggot, mites, leafhoppers, and leafrollers. It's necessary now to increase calcium chloride sprays to 12 lb/acre to control cork spot, bitter pit and Jonathan spot in apples. Picking of early apple varieties such as Red Free, Pristine, William's Pride, Ginger Gold, Mollies Delicious, Lodi, Dayton, Duchess, and Prima is going on in many pick-your-own apple orchards. Peaches and fall-bearing raspberry picking is going on as well. I have observed light green color on current year growth in some apple trees and hail damage on apple fruits in some orchards.

Harvesting of sweet corn, muskmelons, tomatoes and other vegetables is continuing on most farms. Corn borer & earworm moth counts have been very low [but see note below under "Vegetable Insects"]. Tomatoes and peppers are looking good at the moment, but growers need to water them well during hot and dry conditions in order to avoid blossom end rot on developing fruits. Early blight, bacterial canker, anthracnose, and bacterial spot were observed on tomatoes in some farms. In vine crops, powdery mildew and downy mildew were observed in many fields, and a few plants infected with bacterial wilt have been noted. Other observations on vine crops: squash bugs, aphids, and western corn rootworm beetles feeding on leaves and fruits; gummy stem blight on muskmelons; and spider mites on watermelon leaves. In sweet corn, western corn rootworm beetles were observed feeding on silk and leaves; aphids are on tassels; and rust is evident on leaves.

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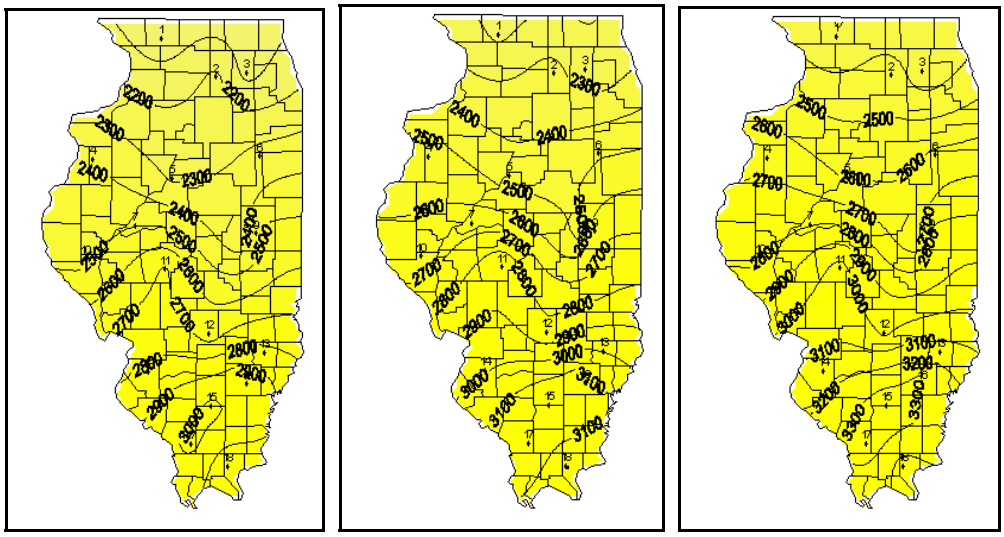
Degree-Day Accumulations and Projections



DD accumulations, base 50 F, for January 1 through Aug 25 (left) and projected through Sep 1 (center) and Sep 8 (right).

No.	Station	County	Base 50 Degree-Days Jan 1 - Aug 25
1	Freeport	Stephenson	2037
2	Dekalb	Dekalb	2222
3	St. Charles	Kane	2066
4	Monmouth	Warren	2403
5	Peoria	Tazewell	2286
6	Stelle	Ford	2338
7	Kilbourne	Mason	2496
8	Bondville	Champaign	2307
9	Champaign	Champaign	2520
10	Perry	Pike	2469
11	Springfield	Sangamon	2713
12	Brownstown	Fayette	2647
13	Olney	Richland	2827
14	Belleville	St. Clair	2819
15	Rend Lake	Jefferson	3018
16	Fairfield	Wayne	3000
17	Carbondale	Jackson	3026
18	Dixon Springs	Pope	2814

To view an up-to-date contour map of accumulated degree-days in Illinois, go to http://www.sws.uiuc.edu/warm/pestdata/choosemap.asp?plc=#, and select a base temperature of 50˚F. To reach the degree-day calculator, go to: http://www.ipm.uiuc.edu/degreedays or http://www.sws.uiuc.edu/warm/agdata.asp.

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Upcoming Meetings

Illinois Pumpkin Growers' Field Day (repeating an announcement from Issue14)

Commercial pumpkin growers and others interested in pumpkin production are encouraged to come to St Charles, IL on September 9 to participate in the annual Illinois Pumpkin Growers Field Day. This event provides attendees with an opportunity to hear researchers and specialists discuss issues in pumpkin production and show pumpkin field research in progress. This event is sponsored by the University of Illinois and hosted by the St Charles Horticulture Research Center, a field station of the UI Department of Natural Resources and Environmental Sciences. Speakers from the Department of Crop Sciences, UI Extension and Southern Illinois University will also be on hand.

Participants can expect to see a number of projects that will address many of the pressing issues that pumpkin growers face. 2003 was a very challenging season for pumpkin growers in northern Illinois, and some of this research is designed to directly address some of those issues. Dr Mohammed Babadoost, Vegetable Disease Specialist, will be on hand to discuss his work with disease management in jack o'lantern pumpkins. His work includes evaluating a number of fungicide materials and combinations of these materials in various rotations. Growers who have had challenges with weed control will find a number of studies and speakers to address issues such as proper timing and application of Sandea herbicide, potential new broadleaf pre-emergence herbicides, an IR-4 evaluation of Dual herbicide for weed control in pumpkins, and several others.

Dr Alan Walters of Southern Illinois University will be on hand to discuss pumpkin varieties and their performance statewide. Many new pumpkin cultivars have included novel features which Dr. Walters will discuss. Dr. Maurice Ogutu will be on hand to discuss his ongoing work with cover crops in pumpkin production, including a discussion of the performance of the

pumpkin crop in a cover crop system. Performance of reflective mulch films for reducing the impact of virus infection of pumpkins will be another project discussed on the tour. Other speakers will also be on hand.

Growers who want to attend should arrive for registration at-the-door by 10:00 am. Tours of research will begin by 10:30 and lunch will be made available for a donation at 12-12:30. Afternoon tours will resume after lunch and continue until approximately 4:00 pm. Participants can find the St Charles Horticulture Research Center 5 miles east of IL Rt 47 on IL Rt 38. At the intersection of Peck Road and Rt 38, turn north. The Research Center will be the first driveway on the left. Participants coming from the east will find Peck Road 1 mile west of Randall Road on Rt 38. Again, turn north and the Research Center will be the first driveway on the left. Questions may be directed to Bill Shoemaker, Superintendent, at 630/584-7254.

Bill Shoemaker (630-584-7254; wshoemak@inil.com)

Notes from Chris Doll

It seems like it has been a cool summer, but the way the fruit season continues indicates that it has not been that cool. You can also see corn ready for harvest, orange pumpkins, and many trees and shrubs turning color – well ahead of Labor Day. Today's harvest from the Back-40 includes the remnants of thornless blackberry (and some 2nd crop Kiowa), several red raspberries, the end of the 20th Century Asian pear, Magness and Honeysweet pear, Redskin peach, Del Rio Ray nectarine, Honeycrisp and Senshu apples. Grapes have been harvested by flocks of birds, so I will have to buy my wine this year. Strong winds on the night of the 25th shook off a few fruit, and I hope it wasn't too bad in other orchards. Rainfall this week has been adequate to keep everything green and growing.

Apple harvest has begun in the area with outstanding color for some of the red varieties, and even Honeycrisp at Belleville. The orchards I have visited recently have excellent size, color and smoothness. There have been a fair number of push-offs on the ground, but its nice to know that they were that rather than codling moth infested. Rubyjons are generally full colored and I saw a few that already show heat symptoms. And one block on M9 has shown that 3-inch Rubyjons can be grown. Some white rot infections are present in a Golden Orchard with a historical problem, and with the current wet and humid conditions, more may develop.

NAA for stop-dropping apples may be needed in the near future. Usually, 10 ppm is used unless grower experience deems higher rates are needed. It takes three or four days be become effective, and can last for seven to ten days. A second application can be made if the first doesn't last long enough. There may be some increase in ripening from its use, but this is not always visible.

At a fruit and nut tour of the University of Missouri's New Franklin Farm last week, I saw a block of 4-yr-old black walnut on a vertical 4-wire trellis that had some of the same effects on the nut tree as on apples. They were well trained and into early fruiting. On the same tour, Dr. Bill Ried of Kansas State showed us the pecan variety test block and said that "if you are not growing Pawnee, you are not a pecan grower". Dr. Michelle Warmond showed us the 4th-leaf peach rootstock trial that included the Cadaman rootstock. She also had a few of the new primocane blackberries from Arkansas for sampling.

In browsing through Penn State's Tree Production Handbook, I noted that their orchard budgets for apples and peaches use the figure of $9.21 per acre for equipment and labor to mow an acre, with four mowings a year suggested for a total of $36.81 per year. Herbicide applications were estimated at $35.11 per acre for material, labor and equipment. Without listing a yield figure, the figure for harvesting apples is $1080 for 272 trees per acre. Peach harvest costs were estimated to be $550 per acre of 141 trees.

Chris Doll
Edwardsville, Illinois

Nutrient Deficiency in Fruit trees *(continued from earlier issues)*

In previous issues I had covered how to identify nutrient deficiencies and sample leaves for nutrient analysis. This issue covers how to interpret the data. In the table below I have listed deficient, normal, and excessive ranges for each nutrient. However, there are a few precautions that you must consider when using this table to interpret data from your own orchard. For example, optimum nitrogen will usually be about 10% higher in young trees and in low crop years, especially in areas with high organic matter like Illinois. Heavily pruned trees with low crop load will likely have higher nitrogen levels than moderately pruned trees. Also, apple trees grafted on dwarfing and semi dwarfing rootstocks such as Budagovsky 9 (Bud-9), M.9 clones, and M.26 will also have about 10 to 12% higher nitrogen than non dwarfing rootstocks like MM.111 or M.106. Another important factor that may affect the data is the type of pesticide used. If you use pesticides that have high levels of magnesium, chances are your data will be skewed and so you have to adjust your rate taking this into consideration.

Notice that macronutrients are in % dry weight while micronutrients are in parts per million (ppm).

Table 1. Low, adequate and high levels of macronutrients in apple, peach, strawberry and blueberry leaves and grape petioles.

Crop	Level	Percent Dry Weight (%dwt)				
		N	P	K	Mg	Ca
Apple leaves	**Low**	<1.0	<0.1	<0.5	<0.1	<0.8
	Adequate	1.8-2.6	0.15-0.3	1.2-1.8	0.2-0.35	1.0-2.5
	High	>3	>0.3	>2.0	>0.5	>0.3
Peach leaves	**Low**	<2.0	<0.1	<1.0	<0.1	<0.5
	Adequate	2.5-3.4	0.15-0.3	1.8-2.8	0.3-0.5	2.0-3.5
	High	>3.5	>0.35	>3.0	>0.5	>3.5
Grape petioles	**Low**	<0.5	<0.1	<0.6	<0.3	<0.5
	Adequate	0.6-1.5	0.15-0.4	0.8-2.5	0.5-1.5	1.0-3.0
	High	>1.5	>0.5	>2.7	>1.5	>3.5
Strawberry leaves	**Low**	<1.6	<0.1	<1.2	<0.1	<0.5
	Adequate	1.8-3.0	0.2-0.4	1.5-2.5	0.2-0.5	0.7-2.0
	High	>3.0	>0.5	>2.8	>0.5	>2.0
Blueberry	**Low**	<1.5	<0.1	<0.3	<0.1	<0.2
	Adequate	1.6-2.0	0.2-0.4	0.35-0.8	0.15-0.3	0.4-1.0
	High	>2.2	>0.5	>1.0	>0.3	>1.0

Table 2. Low, adequate and high levels of micronutrients in apple, peach, strawberry and blueberry leaves and grape petioles.

Crop	Level	Parts per Million (ppm)			
		Manganese	Iron	Zinc	Boron
Apple leaves	**Low**	<20	<20	<10	<15
	Adequate	20-200	50-200	15-100	40-70
	High	>400	>400	>200	>100
Peach leaves	**Low**	<20	<20	<10	<15
	Adequate	20-200	80-200	20-100	40-70
	High	>400	>400	>200	>100
Grape petioles	**Low**	<20	<5	<10	<15
	Adequate	20-200	15-100	20-100	20-60
	High	>400	>200	>200	>100
Strawberry leaves	**Low**	<20	<20	<10	<20
	Adequate	20-200	50-200	50-100	100-150
	High	>400	>300	>200	>200
Blueberry	**Low**	<20	<20	<5	<20
	Adequate	20-200	30-100	10-100	20-60
	High	>500	>300	>200	>100

(I know most of you know this, but "<" means less than, and ">" means more than.)

Before you go out armed with your sprayer filled with nutrients to spray your block of trees or vines, make sure to consider the following. If you are a direct marketer that cares about quality and a little bit less about looks, then consider the following: Nitrogen deficiency in Illinois is uncommon in most young apple orchards, however, in heavy crop years a small amount of calcium nitrate (2 lb per acre) applied after fruit set may increase fruit size and improve the chances of return bloom. Excessive nitrogen on the other hand increases fruit size, but reduces fruit color and sugar content. In peaches, nitrogen is critical for fruit size and tree vigor and so it must be applied on an annual basis. Here is an example: Leaf nitrogen analysis of a 'Gala' block sampled during the middle of July tested 1.7% nitrogen, which is low according to Table 1 above. If the tree had been pruned heavily the year before, then adding more nitrogen is warranted since some of the nitrogen will be tied up in new leaves. You may also want to increase the nitrogen level slightly if the trees are on dwarfing rootstocks such as Malling 9 or Bud-9. Similarly, if potassium level is 1.2% it should be adjusted, especially if nitrogen is adjusted too, because high nitrogen increases the demand for potassium. The same can also happen between calcium and Mg and Fe and Mn. I am sure there are many more factors to take into considerations. Finally remember, one year's data is not good enough for you to make a sound decision, you will make a much better decision if you use more than one year's data.

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Cider Regulations

In late last July, the FDA issued its recommendation on ozone use to reduce pathogens in cider. The FDA does not object to using ozone or other approved treatments to treat cider as long as they comply with the 5-log reduction of *E. coli*, *Cryptosporidium,* and other important pathogens. However, the US Center for Disease Control and Prevention reported that the 2003 outbreak of cryptosporidiosis in Ohio was caused by an apple cider that had been treated with ozone. The outbreak sickened 148 people. Any treatment that you choose to treat your cider must have been proven to achieve a 5-log reduction of pathogens like *E. coli*. One of the most critical factors in deciding whether a treatment is effective in achieving a 5-log

reduction is to run validation studies. These studies are usually run by universities, the manufacturer of the equipment, or by private or government laboratories. In its recommendation, the FDA stated that it is not aware of any published scientific study that establishes conditions for ozone treatment of apple cider that achieve the 5-log reduction of any pathogen. Therefore, the FDA advises all producers who wish to use ozone to treat apple cider, that they must be certain to comply with the pathogen reduction provisions of the regulation (Provisions 21CFR part 120 and 21 CFR 101.17(g)), including establishing a validation of the process. Simply put, the government said that based on what we know now, we are not certain that ozone achieves the 5-log reduction of *E. coli* or any other pathogen. So if you plan to use it you must prove to the government that it works.

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Codling Moth ... still

Pheromone traps continue to catch codling moths in orchards throughout much of Illinois. At the University of Illinois orchard at the edge of Urbana, counts averaged around 35 per trap per week for the period ending August 26. Second and third generation flights tend to extend over such long time periods that they run together and in some orchards present the need for almost continuous protection of fruit by cover sprays applied at time intervals that replace a protective deposit on fruit whenever the previous spray has broken down or been washed off. The only way to know whether or not (and when) a spray is needed is to monitor pheromone traps and react according to the numbers of moths they catch. As long as traps are catching more than 3 to 5 moths per trap per week, subsequent hatch is likely to be sufficient to produce enough larvae to cause excessive stings and tunnels ... even in early- and mid-September. Where control is needed, be sure to choose insecticides with relatively short preharvest intervals to allow timely harvest without excessive (illegal) residues.

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Vegetable Production and Pest Management

Vegetable Insects

Late Season Reminders

Corn earworm counts have gone up some in at least a few locations in central and northern Illinois, and although this has not been a year of heavy flights of this insect in most of the state, growers are advised that moths flying now are laying more of their eggs in vegetables because field corn is no longer attractive. That means that catching even a few moths every night can be a signal of likely damage to sweet corn, tomatoes, peppers, and green beans.

Squash bugs are present throughout the state in all growth stages. In the south, a summer generation of adults (those that grew up from eggs laid earlier this year) is laying eggs, and I found eggs, nymphs, and adults in fields from Dixon Springs through the Belleville-Collinsville area. In the north, nymphs and adults are present. Only adults will overwinter, so the immatures (nymphs) will continue to feed until they mature or are killed by frost. Keep scouting for these insects in squash and pumpkins.

Grasshoppers are not strictly vegetable pests, but they feed on most vegetable crops, and it's this time of year that larger nymphs and adults can do a lot of damage in a short time as they move into a variety of vegetable crops from ditch banks and grassy areas surrounding fields. Scout frequently for grasshoppers and their damage – removal of large amounts of foliage; among insecticides that are fairly effective is Sevin (carbaryl), and it's labeled on many vegetable crops.

Whiteflies often build up now (and are doing so in my garden) and through the next 6 weeks or so, especially in southern and central Illinois. Species include the greenhouse whitefly, sweetpotato whitefly, and velvetleaf whitefly. Insecticide resistance is common among pest species of whiteflies, and in general, their presence in crops such as tomatoes, peppers, or cucurbits at this time suggests that the population present in that particular field is resistant to the insecticides in use there. Don't increase the rate or spray more often; instead, check the 2004 Midwest Vegetable Production Guide or the 2004 Illinois Agricultural Pest Management Handbook for insecticides labeled for use against whiteflies on the crop in question, and switch to something that you have not been using in recent weeks.

Corn rootworm beetles can cause serious damage to sweet corn by feeding on silks and to cucurbits by feeding on the surface of fruits (pumpkins in particular, but melons, squash, and cucumbers too). Scout frequently, and if an insecticide is used, be sure to scout again in a few days for reinfestation.

Spider mites are present in some areas on tomatoes, sweet corn, eggplant, watermelons, and cucumbers. Rains and cooler weather that reached many areas August 29 should reduce their success, but be sure to scout and react accordingly.

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