February 11, 2011 | Volume 15 | Issue 2

Ohio Fruit ICM News

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If you have articles for the newsletter that you would like to have considered to be included in upcoming issues, please submit to either Howard Siegrist at siegrist.1@cfaes.osu.edu or Melissa Swearingen at swearingen.34@cfaes.osu.edu

United States Department of Agriculture
National Agricultural Statistics Service

FRUIT

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February 2, 2011

2010 ANNUAL NONCITRUS FRUIT PRODUCTION SUMMARY

Ohio's apple growers produced an estimated 83.2 million pounds in 2010, a decrease of 32.3 million pounds from 2009. There were 6,300 bearing acres, a decrease of 500 acres from 2009. The 2010 preliminary season average price is estimated at 37.4 cents per pound, up 2.2 cents from the 35.2 cents per lb reported in 2009. The value of utilized production is estimated at $26.8 million, down 30.6 percent from $38.7 million in 2009.

Peach growers produced an estimated 6,240 tons in 2010, up from 2,560 tons in 2009, an increase in production of 144 percent. The 2010 bearing acres are down 100 acres from last year's acreage of 1,300. The 2010 average yield per acre increased to 5.20 tons per acre from 1.97 tons per acre in 2009. Preliminary season average price is estimated at 1,580 dollars per ton, a decrease of 60 dollars per ton. The 2010 value of utilized production increased to $9.45 million from $3.95 million in 2009, an increase of 139 percent.

The 2010 Ohio grape production decreased from 5,740 tons in 2009 to 3,470 tons in 2010. Of the total production, 40 tons were utilized for the fresh market, and 3,010 tons were processed. The 2010 average yield of 1.83 tons per acre decreased from 3.02 tons in 2009. The 2010 season average price is estimated at $711.00 per ton, a 27 percent decrease in price from the 2009 price per ton of $973.00. The total value of utilized production is estimated at $2.17 million, down from $5.04 million in 2009.

Ohio strawberry growers produced an estimated 35,000 cwt in 2010, an increase of 5,000 cwt from 2009. Harvested acres of strawberries are estimated at 730 acres in 2010, up from 710 acres in 2009. The 2010 average yield of 48 cwt per acre is an increase of 6 cwt per acre from 2009. The season average price estimate is $272.00 per cwt, up from $191.00 in 2009. The value of utilized production is $9.52 million, up 66.1 percent from the 2009 value of $5.73 million.

Apples, Peaches, Grapes, and Strawberries, Ohio and United States 2008-2010

Crop	Year	Bearing Acres	Yield	Total Production	Utilization		Season Average Price	Value of utilized production
					Fresh	Processed		
		Acres	Pounds/ac	Million lbs.	Million lbs.		Dollars	Thou. Dol.
Apples:								
	2008	7,000	14,900	104.0	79.0	9.9	0.423	37,575
	2009	6,800	17,000	115.5	90.7	19.3	0.352	38,682
	2010	**6,300**	**13,200**	**83.2**	1/	1/	**0.374**	**26,836**
U.S.	2008	350,590	27,500	9,633.3	6,273.9	3,265.8	0.232	2,214,717
	2009	347,800	27,900	9,704.9	6,313.9	3,139.2	0.231	2,187,008
	2010	**344,550**	**27,000**	**9,286.6**	1/	1/	**0.234**	**2,150,092**
		Bearing Acres	Tons/Ac	Tons	Tons		$/ton	Thou. Dol.
Peaches:								
OHIO	2008	1,300	5.08	6,600	6,500	-	1,370.00	8,905
	2009	1,300	1.97	2,560	2,410	-	1,640.00	3,952
	2010	**1,200**	**5.20**	**6,240**	**5,980**	-	**1,580.00**	**9,448**
U.S.	2008	124,000	9.16	1,135,310	529,800	583,700	490.00	545,854
	2009	118,830	9.29	1,103,770	502,920	579,690	548.00	593,653
	2010	**117,630**	**9.79**	**1,151,300**	**567,220**	**564,370**	**543.00**	**614,619**
Grapes:								
	2008	1,900	2.98	5,660	70	5,280	356.00	1,902
	2009	1,900	3.02	5,740	20	5,160	973.00	5,040
	2010	**1,900**	**1.83**	**3,470**	**40**	**3,010**	**711.00**	**2,169**
U.S.	2008	935,950	7.82	7,319,260	985,200	6,320,350	456.00	3,332,732
	2009	942,800	7.75	7,307,440	938,800	6,341,100	505.00	3,675,601
	2010	**944,800**	**7.26**	**6,856,770**	**965,110**	**5,888,890**	**507.00**	**3,471,740**
		Harvested Acres	Cwt/ac	Thousand Cwt	Thousand Cwt		$/cwt	Thou. Dol.
Strawberries:								
OHIO	2008	770	55	42	42	-	174.00	7,308
	2009	710	42	30	30	-	191.00	5,730
	2010	**730**	**48**	**35**	**35**	-	**272.00**	**9,520**
U.S.	2008	54,470	465	25,317	20,911	4,406	75.80	1,918,288
	2009	58,080	482	28,013	22,880	5,133	76.00	2,129,585
	2010	**56,990**	**500**	**28,501**	**23,178**	**5,323**	**78.80**	**2,245,319**

1/ Estimates for 2010 will be published in July 2011.

THE OHIO STATE UNIVERSITY EXTENSION

EMPOWERMENT THROUGH EDUCATION

2011 Upcoming Events:

February 21-22: Ohio Grape and Wine Conference Returns This Year - Nationwide and Ohio Farm Bureau 4-H Center on Ohio State University's Columbus campus. Details, full schedule and a registration form can be found at http://www.oardc.ohio-state.edu/grapeweb/images/2011_OG&WC_Registration_Material_.pdf

February 25: 2011 Fruit & Vegetable School - Dawes Arboretum, Newark, OH. For an information flyer click on the following link: **2011 Fruit & Vegetable School flyer**

March 11-12: "Opening Doors to Success" - Southwest Ohio Small Farm Conference and Trade Show. Wilmington College Campus. For more info contact: L. Tony Nye, OSU Extension Educator at 937-382-0901 or email: nye.1@osu.edu

Small Fruit Pesticide Label Changes

Kathy Demchak, Department of Horticulture
Penn State University

General
On some labels, we now see the mention of the low-growing berry subgroup (Group 13-07G), which includes low-bush blueberry and cranberry. The use of this grouping allows materials to be used on crops that previously rarely appeared on pesticide labels.

Subtraction
Endosulfan (trade name Thionex, and formerly Thiodan) use is being terminated due to concerns about worker safety and endosulfan's ability to accumulate in the food chain. Existing stocks of Endosulfan may still be used.

Additions
Portal® (fenpyroximate, Nichino America, Inc.) is labeled for use on the low-growing berry subgroup, which includes strawberries. Use of this product is limited to two applications per season at least 14 days apart to avoid resistance development. Fenpyroximate is in IRAC activity group 21A, which is different from other activity groups labeled on strawberries. The pre-harvest interval (PHI) is 1 day, and the re-entry interval (REI) is 12 hours.

Altacor® (chlorantraniliprole, aka rynaxypry®, Dupont) is labeled for use on caneberries (raspberries, blackberries, etc.) for the target pests omnivorous leafroller (not a problem in PA) and raspberry crown borer (adults), which can be a problem here, most frequently on blackberries. The PHI is 3 days, and the REI is 4 hours.

Danitol® 2.4EC (fenpropathrin, Valent) is labeled for use on caneberries, (besides strawberries and blueberries on which it had already been labeled) with the most utility against Japanese beetle. It also is labeled for use for two-spotted spider mites, but the use of broad spectrum insecticides such as pyrethroids (part of the pesticide group into which fenpropathrin falls) is tough on beneficial mites, and thus has often resulted in pest mite flare-ups. The PHI is 3 days, and the REI is 24 hours.

Spotlight on Strawberry Tissue Analysis and Spring Nitrogen Recommendations

Brenda Cleveland, NCDA&CS Agronomist (http://www.ncagr.gov/)
Article from The Strawberry Grower

Soil testing provides lime and fertilizer recommendations to help get the strawberry crop off to a good start. Later, during bloom and fruit stages, the NCDA&CS Agronomic Division recommends using plant tissue analysis on a biweekly schedule to determine if the crop has taken up essential nutrients at optimum rates. This test includes a measurement of the petiole nitrate-nitrogen (NO3-N) concentration.

For plasticulture strawberry, NCDA&CS recommends 120 lbs nitrogen (N) per acre: 60 lbs to be applied preplant and the remaining 60 lbs in the spring during bloom and fruiting. The suggested practice is to apply the spring N through the drip tape at a rate of 5.25 lbs per acre (actual area, not area under plastic) per week.

Fertilization of an intensively managed, high-value crop like strawberry requires knowledgeable decision-making. Potential consequences of too much N include soft fruit with poor shelf life, reduced yield, poor cost-benefit ratio and environmental pollution. On the other hand, too little N results in poor growth and reduced yield. The crop uses only about one-third of the preplant N by the time active spring growth begins. At that time, the NCDA&CS Plant Analysis Report should be used to determine the appropriate rate of N to apply.

The plant report's N recommendation is based on the growth-stage week and the amount of NO3-N detected in the petiole sample (see page 3). These recommendations are based on work done by Gordon S. Miner (NCSU) and C. Ray Campbell (NCDA&CS) in the 1990s on Chandler and Camarosa varieties. Their research resulted in the development of petiole NO3-N sufficiency ranges for each week of the bloom and fruiting growth stages (see table below).

Here is how the recommendations work. When the petiole NO3-N concentration is within the desired range, 5.25 lbs N per acre per week is recommended. When the petiole NO3-N concentration falls below the desired range, 7.0 lbs N per acre per week is recommended. When the petiole NO3-N concentration is above the desired range, no N is recommended. The recommendations are guidelines and must be used in conjunction with site-specific factors – such as fertilization history, temperature, and pest/disease pressure – to make the most appropriate nutrient management decisions.

The growth stage (GS) and week coded by the grower on the Plant Sample Information form drives the N recommendation. The bloom (B) growth stage starts the first week of bloom and continues for approximately five weeks; the fruit (F) growth stage starts the first week of berry harvest and continues approximately seven weeks or through the final fruit harvest. B week 1 is characterized by the presence of 5–10 open blossoms on at least 50% of the plants. It also means that strawberries will be ready to pick in 4½ to 5 weeks. For example, if a tissue sample is collected on March 15 during the first week of bloom, then the grower should be anticipating berry harvest the week of April 19.

Customized NCDA&CS agronomist comments and recommendations are based on tissue test results and crop growth stage and week. For this reason, it is critical that the Plant Sample Information form be filled out correctly and completely. Recommendations cannot be provided based on analytical results alone. Incorrect or incomplete information on the form may lead to incorrect N recommendations. For example, a crop with a petiole NO3-N concentration of 1600 ppm does not need any N if it is week 1 of bloom, but if it is actually week 2 of bloom, a recommendation of 7 lbs per acre is appropriate. As an alternative, or in addition, to specifying growth stage and week, the grower can indicate when strawberry harvest will begin or how long it has been underway.

Be sure to send samples *to the correct address and in a way that gets the sample there quickly. Visit www.ncagr.gov/agronomi/uyrplant.htm to download the plant sample information form, which includes these addresses. The site also has instructional powerpoints on collecting the sample, filling out the form, and understanding the report.*

In summary, each strawberry tissue sample should include 25-30 trifoliate leaf blades with the petioles detached, a completed Plant Sample Information form, and a processing fee of $7 per sample (see a pictorial guide at www.ncagr.gov/agronomi/pictorial.htm). Out-of-state growers are also welcome to use these services, at a cost of $27 per sample. The NCDA&CS Plant Analysis Report will provide concentrations for 11 of the essential plant elements in the leaf blade as well as petiole NO3-N, an interpretation of the results, and recommendations. Recommendations other than the N rate are based upon leaf blade results. For any questions related to strawberry tissue analysis, please contact agronomists Brenda Cleveland or Michelle McGinnis at 919-733-2655 or the regional agronomist assigned to your area (www.ncagr.gov/agronomi/rahome.htm).

NCDA&CS Petiole Nitrate Nitrogen (NO3-N) Sufficiency Range and Nitrogen (N) Rate Recommendations by Growth Stage and Week

Growth Stage[1]	Week	Petiole NO_3-N Sufficient Range (ppm)	Nitrogen Rate Recommendation when Petiole NO_3-N is: Below—	Within— the Sufficient Range	Above—
B	1	600–1500			
B	2	4000–6000			
B	3	4000–6000	7 lb N/a/wk	5.25 lb N/a/wk	None
B	4	3500–6000			
B	5	3000–5000			
F	1	3000–5000			
F	2	3000–5000			
F	3	3000–5000			
F	4	2000–4500	7 lb N/a/wk	5.25 lb N/a/wk	None
F	5	2000–4000			
F	6	1500–3000			
F	7	1000–2000			

1. B = Bloom F = Fruit (harvest begins)

Selecting a Small Sprayer for the Small Berry Crop Planting

Andrew Landers, Senior Extension Associate, Department of Entomology, NYSAES
Cornell University
Article from New York Berry News - Volume 10 Number 1 - January 20, 2011

There are many important points to consider before purchasing a sprayer, not the least of which is the area to spray, the proximity of the local supplier, standard of manufacture, etc. There are many growers with small plantings who need spraying equipment ranging from backpack sprayers to small truck- or ATV-mounted machines.

Canopy Sprayers:

Backpack Sprayers: Small capacity (4-5 gallon) sprayers will produce up to approximately 100 psi pressure. Weight is an important consideration and growers should select a sprayer with good, wide, padded straps to ease the load on your shoulders. Correct nozzle selection according to the target is very important to ensure even coverage. A good-sized filling hole at the top is also important.


Backpack Sprayer

There are three factors affecting application rate – forward speed, pressure, and nozzle tip size. Unfortunately, most inexpensive backpack sprayers have no pressure gauge. Pay more money and purchase a backpack sprayer with a pressure gauge or, better still, purchase a spray management valve as standard or as an option. Normally output increases or decreases according to the pressure in the system, (which is dependent upon how vigorous you are in pumping the handle up and down). A spray management valve, such as a CF valve, will ensure a constant output irrespective of hand pump action. The CF valve evens out fluctuations in pressure, e.g. will only allow a maximum and minimum pressure thus ensuring even flow. The Fountainhead Group (http://www.thefountainheadgroup.com/) sells a backpack sprayer with a simple valve which ensures the correct pressure is not exceeded.

An alternative to the hand-operated backpack sprayer is an electrically-operated backpack sprayer, which utilizes a small rechargeable battery. Maximum pressure is relatively low and it is easier than using a traditional hand pump system, particularly if you have many rows of plants to spray. Similarly a small back pack sprayer fitted with a small gas engine is available. The electric version is quieter to use, but you must remember to recharge the batteries otherwise spraying will be delayed.

Portable Mist and Air Blower Backpacks: These are ideal for plantings where canopy penetration is required, e.g. denser, vigorous plantings. A small gas engine drives a fan blower which creates an airstream which passes along a hand-held tube (similar to a leaf blower). The tube has a nozzle situated at the end so that liquid spray can be squirted into the airstream. The operator directs the spray cloud t wards the canopy by pointing the hand-held tube. It is preferable to point the tube backwards to avoid walking into the spray cloud. Engine speed can be reduced which enables a slower airspeed to match a smaller canopy in early season. They are very good at rustling the canopy and getting good penetration and deposition. They are heavy! Noise is a problem, so ear protection must be worn.

Portable Gas Engine-driven Sprayers: If weight is a problem, and ground conditions are relatively smooth, a number of manufacturers offer a sprayer with a small gas engine and a 10 to 12 gallon tank. Larger capacity tanks (14 to 100 gallons) are often trailed and can be pulled by a lawn tractor, ATV, Gator, or small tractor.

Small, Mounted Sprayers: Ideal for mounting onto the carrier rack of an ATV, 15 to 25 gallons, they use a small electric pump to provide up to 70 psi. When used with a hand wand and a hose, they can be used to spray short length rows. The same system is ideal for weed control and spot spraying of weeds.

Large, Skid Mounted Sprayers: Ideal for fitting into the back of a pick-up truck, these sprayers have a tank capacity of 35 to 200 gallons, and an electric-start gas engine.


Small pull behind air-blast sprayer used in high-bush blueberry planting.

Small, Trailed Air-blast Sprayers: Very small air-blast sprayers, with tank capacities up to 110 gallons and a 5.5 to 20 hp gas engine, can be towed by an ATV or a small tractor. Larger tank capacities up to 300 gallons are also available but require larger tractors with weights and brakes for safe operation. Remember, the larger the gas engine, the more important it is to buy an electric start option. Small air-blast sprayers are ideal in blueberry plantings with tall plants but suffer from a lack of air direction, therefore purchase sprayers with deflectors or towers to direct the air into the canopy.

Small, Mounted Air-blast Sprayers: Three-point hitch, PTO-driven models with a 22- or 24-inch fan, for fitting onto 25 plus hp tractors are available. Beware of drift, again consider models which direct the air via deflectors or towers.

Continued from Page 4: Selecting a Small Sprayer for the Small Berry Crop Planting

Andrew Landers, Senior Extension Associate, Department of Entomology, NYSAES
Cornell University

Herbicide or Ground Application Sprayers:

"Where occasional weeds and access over wet land are a problem, the use of a hand-held wick wiper is an easy-to use, effective option. "

Backpack, Small ATV-Mounted Tank, and Hand-Lance Sprayers : These sprayers can be used for herbicide application BUT be very careful that there is no carry-over from herbicide residues in the sprayer, therefore wash them out very thoroughly before using them to apply materials other than herbicides. Alternatively, have dedicated herbicide-only equipment.

Controlled Droplet Applicators (CDA): The use of CDA's will considerably reduce the need to carry vast amounts of water. A spinning disc (battery powered) will produce 95% of the same-size droplets, thus reducing herbicide rates by at least 50% and water rates by 75%. Herbi and Mantis (trade names) are both hand-held CDA sprayers. ATV- or tractor-mounted shielded CDA sprayers such as the Environmist also reduce spray rates while shielding the plants from the spray. More information:
http://www.micron.co.uk/products

Wick Wipers: Where occasional weeds and access over wet land are a problem, the use of a hand-held wick wiper is an easy-to use, effective option. A small tank, usually contained in the handle, holds the liquid, which soaks a rope wick or a sponge. The rope or sponge can then be wiped against the weeds.

This and more information on spray technology for small scale berry plantings is available in the 2011 Cornell Berry Pest Management Guidelines for Berry Crops. To order your copy visit: http://ipmguidelines.org/Berry Crops/ or by phone: 607-255-7282. Cost is $25 which includes shipping.

Special thanks to Cornell University's Pest Management Education Program (PMEP) and Dr. Andrew Landers for allowing us to reprint this material.

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We gratefully acknowledge the continued help and financial support of our local county commissioners. We appreciate their input and participation in our programming efforts.

Strawberry Genome—Sequence Will Lead to Better Fruit for Consumers

Mickie Anderson, University of Florida Institute of Food and Agricultural Sciences (University of Florida News)

http://news.ufl.edu/2010/12/26/strawberry/
Article from New York Berry News - Volume 10 Number 1—January 20, 2011

G AINESVILLE, Fla. - An international team of scientists led by the University of Florida and Virginia Tech is the first to publish the DNA sequence for the strawberry - a development expected to yield tastier, hardier varieties of the berry and other crops in its family.

Kevin Folta, a University of Florida associate professor of horticultural sciences, displays the woodland strawberry in his laboratory at UF's main campus on December 20, 2010.

Folta, of UF's Institute of Food and Agricultural Sciences, and researchers from Virginia Tech led a consortium of 72 international scientists that was the first to publish the DNA sequence for the strawberry.

Also shown are other members of the Rosaceae family of flowering plants expected to benefit from the research, including cultivated strawberry, apples and cherries.

The genome sequence, obtained by a team of 75 researchers from 38 institutions around the globe, will be published Dec. 26 in the online version of the journal Nature Genetics.

"We've created the strawberry parts list," said researcher Kevin Folta, an associate professor with UF's Institute of Food and Agricultural Sciences. "For every organism on the planet, if you're going to try any advanced research, such as molecular-assisted breeding, a parts list is really helpful. In the old days, we had to go out and figure out what the parts were. Now we know the molecular nuts and bolts that make up the strawberry plant."

Having that "parts list" in hand will enable strawberry breeders to bring new varieties to market faster, creating plants that can be grown with less environmental impact, better nutritional profiles and larger yields.

"All of those dividends are probably at least a decade off, but they are definitely realities on the horticultural radar screen," said Folta, a member of the UF Genetics Institute.

Vladimir Shulaev, a University of North Texas biological sciences professor who led the project while a faculty member of the Virginia Bioinformatics Institute at Virginia Tech, said having the genome sequence means strawberry breeders can unravel - and improve upon - even a complex trait, such as fruit quality or aroma. It will also help to create fruits containing higher levels of phytochemicals with health benefits.

Janet Slovin, a plant molecular biologist with the U.S. Department of Agriculture's Agricultural Research Service in Beltsville, Md., who was part of the research team, said scientists may be able to help growers create berries that mature earlier or later than existing varieties so that they can get their product to market when no one else can.

"That means if you're a grower, you can extend your growing season, get a better price per flat, and use your land more—and that's exactly what growers want," she said.

"Having the genome sequence means strawberry breeders can unravel - and improve upon - even a complex trait, such as fruit quality or aroma."

The consortium sequenced the woodland strawberry, a wild relative of today's cultivated strawberry varieties. From a genetic standpoint, the woodland strawberry is similar to the cultivated strawberry but less complex, making it easier for scientists to use in research.

The strawberry is part of the Rosaceae family of flowering plants that includes important agricultural and ornamental crops, such as apples, peaches, cherries, raspberries, plums, almonds and roses. Plants in the Rosaceae family share many important traits, so unveiling the woodland strawberry's genome should mean quicker breeding advances or those crops, as well.

The research was distinctive in several ways, Folta said. First, it had no central funding source, unlike some similar genome-sequencing projects. Scientists donated time and used parts of smaller grants, to cover costs. Second, the consortium was open access - meaning any scientist who had an interest in the project was allowed to play a role, even those who were not experts in genome sequencing or computational biology, Folta said. And finally, the woodland strawberry is the first plant to have its genome sequenced exclusively by a method called short-read sequencing, he said. Such advances have only been recently reported in deriving the genome sequence of animal species, such as the panda. In short-read sequencing, small pieces of DNA are sequenced separately. Those pieces are then strung together using computer software. Folta explained it like this: "If you had the alphabet from A to Z, and someone gave you a piece that was AB- C, and another piece was C-D-E-F, and another piece that was E-F-G-H, you could align all those using the common letters, and eventually develop the whole alphabet."

Strawberry is an excellent crop for scientists to use in genetic and physiological studies, Folta said, because it takes so little space to grow and is a quick-turnaround crop, unlike some others in the Rosaceae family, such as peach, which can take several years to bear fruit.

Ted Campbell, executive director of the Florida Strawberry Growers Association, called the genome-sequencing a "very significant milestone" for growers around the world - including those in Florida, where strawberries are a $338 million-a-year commodity.

Todd Mockler, an Oregon State University associate professor and member of the genome-sequencing team, said it may be a few years before the discovery is noticeable to consumers - but positive changes will come.

"For fruit crops, and strawberry in particular, it will matter to farmers and ultimately, to consumers," he said. "It may mean better yields or pest resistance, improvements in shelf life and things like flavor, fragrance, taste and appearance. Having the genome sequence will enable all of that."

Winter Bramble Chores

Article from The Bramble, Volume, 25, Issue 4 - Winter, 2010-2011

This list was developed by Dr. Gina Fernandez, Small Fruit Specialist at NC State University and reviewed by Dr. Marvin Pritts at Cornell. Chores and timing may be somewhat different in your area or for your cropping system. For recommendations for the Pacific Northwest, we encourage you to subscribe to the email "Small Fruit Update" by emailing info@peerbolt.com.

Plant growth and development

- Plant is "dormant" and accumulating chilling hours.
- Some differentiation may be occurring in the flower buds.

Pruning and trellising

- Pruning should occur in late winter or early spring. Ice storms can do tremendous damage to plants and trellis systems. If you produce blackberries in areas where ice storms are common, pruning can take place early winter to help avoid severe damage. Wait until early spring to prune floricane raspberries so winter injured wood can be removed.
- Make trellis repairs after plants have defoliated but before pruning and training.

Primocane-fruiting raspberries

- Prune (mow) primocane fruiting types to the ground

Floricane-fruiting raspberries

- Prune out the spent floricanes
- Tie canes to wires so they are spread out
- Cut any lateral branches back to 6"
- Thin canes to 6-8 / hill (3' spacing) or 3-4 canes per linear ft. of row

Erect blackberry types

- Prune out the spent floricanes
- Tie canes to wires in a fan shape
- Cut lateral branches back to 8-12"
- Thin canes to 6-8 / hill (4' spacing)

Trailing blackberry types

- Prune out spent floricanes
- Tie or weave canes to wire so that they do not overlap
- Prune side laterals to 12-18"
- Thin canes to 6-8 / hill (6-8' spacing)

Weed control

- Many summer weed problems can best be managed in the fall and winter using pre-emergent herbicides. Determine what weeds have been or could be a problem in your area. Check with local extension educator for cultural or chemical means to control these weeds.
- Establishing new blackberry or black raspberry plants into rows of black plastic or landscape cloth can reduce weed problems significantly. For red raspberries, straw mulch works best since new canes will emerge within the row, and must be able to push through the mulch.

Insect and disease scouting

- Scout fields for insect and disease damage and remove those canes.
- If possible, remove any wild brambles by the roots that are within 600 ft. of your planting during the winter, or treat them with glyphosphate in autumn.
- Apply liquid lime sulfur to dormant canes, just prior to bed break, for disease control.

Planting

- Growers in warmer areas can plant in December. In northern areas, set dormant plants in spring when the soil thaws.
- Take soil tests to determine fertility needs one year before planting. Amend the soil in the fall prior to spring planting.
- Prepare list of cultivars for next year's new plantings. A commercial small fruit nursery list can be found at www.smallfruit.org or www.hort.cornell.edu/nursery .

Water management

- Make repairs to irrigation system (check pumps, lines, etc.).
- Plants generally do not need supplemental water in winter.

Marketing and miscellaneous

- Order containers for next season.
- Make contacts for selling fruit next season.
- Attend grower meetings

Red Cell, Red Drupelet, Color Reversion

Penelope Perkins-Veazie, NCSU
John R. Clark, University of Arkansas
Article from The Bramble, Volume, 25, Issue 4 - Winter, 2010-2011

It's a problem that is becoming more critical as commercial production increases: You have a beautiful, fully black pack of blackberries going into precooling and truck loading. A day later, black fruits start sporting areas of bright red, sometimes a few spots, sometimes 30% of the fruit. This disorder manifests itself only after storage, and is different from heat damage, where the fruit can turn a brownish red if picked in the hot afternoon then not promptly cooled, or from freeze injury, when more than 70% of the berry turns bright red after exposure to air too cold (less than 30◦F) or close to a chilling unit, especially in a transport vehicle.

A blackberry is actually made up of many fruitlets, each with an individual seed. These fruitlets are called drupes or drupelets, and the reddening is on the drupelets themselves. When blackberries were a pretty new item on the shelf, consumers and store managers were happy just to have fruit that weren't moldy. Now, though, as competition increases, more and more costly repacking to eliminate these red berries is being done by growers and shippers.

We first noticed this phenomenon back in 1992 at the USDA in Lane, OK when screening blackberry germplasm for suitable postharvest life. At the time, we were more concerned with mold, leak, and soft berries, and assumed the red drupelets might be from leaky spots. Over the next few years, we noticed this color reversion was appearing much more on some varieties than on others. For instance, Shawnee and Choctaw might have as much as 30% of berries affected while Navaho and Arapaho rarely had over 5%. So, we started a series of experiments to look into this problem with thorny and thornless selections from the University of Arkansas. The first hypothesis was that the red drupelet would occur more often in thorny than thornless selections. Some five years and 50 selections later, it appeared there is no relation – thornless selections can also get this disorder. The harvest period (early, mid, late season), relative fruit maturity, relationship of leaky and/or soft berries, and storage temperatures were also considered. The results from these studies: germplasm was the main player, early fruit were more likely to show red drupelet, shiny black would have a higher percentage red drupelet than dull black fruit, and holding fruit at 41◦ to 50◦F would slightly reduce incidence of red drupelet compared to fruit stored at 35◦F. The number of leaky or soft berries was not correlated with incidence of red drupelet. Berries collected for this work were grown in Oklahoma and Arkansas, and occasionally rainfall occurred during the harvest period.

The next step was to go from trying to associate gross differences with more targeted differences. We determined the amount of total anthocyanin among varieties, thinking that those with more red drupelet might have less total pigment. This turned out not to be true; in fact, some varieties such as Arapaho that have almost no red drupelet tended to have less anthocyanin than those with a high incidence, like Shawnee. In another study, the acidity of the individual drupelets (pH) was measured using micro electrodes. Red drupelet was induced by exposing berries to very cold temperatures (25◦F) for 15 minutes in Shawnee and Navaho berries, and the pH measured on individual black and red drupelets. The pH of the red drupelets was about 3.04 while black drupelets were 3.41. Anthocyanin, the major pigment of blackberries, will show visible color shifts with changing pH. The classic example used is that of red cabbage juice, where a red color is made at acid pH (<7) and a blue color at basic pH (>7). The problem is, no one has determined what the pigment of blackberry fruit will do in a narrow range of pH shifts (between 3 and 3.5, for instance). Another possibility was that the two specific pigments making up total anthocyanin could be increasing or decreasing, causing a color change. We dissected the red drupelets from the black. Dr. Luke Howard at the University of Arkansas found that the pigments were the same in the red and black drupelets (cyaniding-3-glucoside), but the red had only half as much pigment as the black.

So, the pigments stay the same, but are they leaking away? Is the red being caused by vacuole disruption (anthocyanin is contained here), and contact of the pigment crystals with acid? Is the leak caused by a weak point of attachment of drupelets to the cortex (receptacle), or by some sort of insect damage or pathogen?

My technician often observed that the classic red drupelets appeared swollen compared to normal drupelets. Sometimes one can see these swollen drupelets on berries going into storage. However, they don't necessarily turn red. So, generally the red drupelets are going to be swollen, but something else is happening to trigger the reddening. Is it possible that the swollen drupelets are sensitive to chill injury, more than the non-swollen drupelets, and membrane leakage occurs with exposure to low temperatures? Or, are we inadvertently bruising blackberry fruit (with susceptible varieties having a tendency to have more uneven drupelet sizes, and larger drupelets are damaged), and it is later expressed as red drupelet?

How to prevent this disorder from happening? The long term answer is screening of germplasm to see how severe this tendency can be. Several breeders now incorporate this evaluation in their postharvest testing. The best answer (scientifically) is to figure out what the mechanisms might be for this disorder, and even to make sure it is truly a disorder and not an overlooked pathogen or insect problem. Certainly manipulation of temperatures appears to have some effect. This is the one and only case where storing blackberries warmer can help a problem. Of course, breaking the cold chain causes other problems, like accelerated softening and growth of mold. And, adding another layer to all this, it's still not clear if rainfall, irrigation, and relative heat load affect incidence. Certainly in some production areas, varieties with tendency to color reversion will have more incidence than the same varieties grown in other areas. The best advice we have right now is this: try to use varieties that score low in color reversion; protect the top layer of fruit in a pallet from direct exposure to forced air cooling (use a sheet of cardboard or foam on top); and carefully monitor the cooling inside reefers to avoid cold spots as well as warm spots.

For more information email penelope_perkins@ncsu.edu .

Progress Report: Developing and Mapping Single Nucleotide Polymorphisms (SNPs) from the Red Raspberry Genome Sequence

Courtney Weber and Judson Ward
Cornell University
Article from The Bramble, Volume, 25, Issue 4 - Winter, 2010-2011

The objective of the project is to develop reliable sequence based DNA markers based on single nucleotide polymorphisms (SNPs or "snips") between different raspberry genotypes. These markers have utility in breeding new varieties, disease resistance screening and functional genomics as well as other genetic studies in crop species. Potential SNPs markers have been identified throughout the red raspberry genome and specific primers developed for a subset of these SNPs to demonstrate their potential in genetic mapping of red raspberry. A set of reference SNP markers distributed throughout the raspberry genome is being developed. They will act as reference markers for other researchers to compare linkage maps and as a beginning towards more detailed mapping studies of specific areas of the genome associated with traits of interest such as disease resistance, fruit quality parameters and yield components. The specific objectives of the project are listed below:

1. Analyze the complete raspberry genome sequence and transcriptome sequences from BYU and Cornell for potential SNPs through out the genome.
2. Design specific primers for thirty-five, approximately evenly spaced, SNPs (5 on each of the seven chromosomes/linkage groups) for use as reference SNPs for the raspberry genome.
3. Test and map the new markers on a population segregating for resistance to raspberry bushy dwarf virus that is currently being analyzed at Cornell for markers associated with resistance.

Over the past year we have sequences significant portions of the genome of the red raspberry varieties Titan, Latham and Heritage. We sequenced the genomic DNA of the Heritage variety using two different sequencing techniques (Illumina and 454) to a coverage depth of approximately 150 times. This sequence data is currently being assembled into a complete genome. In addition, we have sequenced the transcriptomes (the sum of expressed genes from a specific tissue at a specific time point) from the roots of the Latham and Titan varieties in order to study the genes expressed in the roots in response to attack by *Phytophthora fragariae* var. rubi.

We compared the DNA sequence from the three genotypes to identify possible SNPs throughout the entire genome. Utilizing the transcriptome data from Titan and Latham ensures that the majority of these SNPs originated within actual genes making them very useful for future studies on gene action and genome structure. The initial comparison yielded 137,167 potential SNPs between Titan and Heritage and 157,148 SNPs between Latham and Heritage.

The Heritage genomic sequence was aligned to unpublished genome data from the strawberry *Fragaria vesca*. This provided a scaffold of the genome of raspberry so that markers could be placed relatively uniformly across the genome. We filtered the potential markers to identify a subset of the sequences with the highest probability for being true SNPs (as opposed to an artifact of sequencing) and spaced throughout the raspberry genome. This yielded 208 potential markers to be analyzed for primer design and marker testing.

The primary method for developing SNP markers into specific PCR based markers in this project is by using restriction enzymes that recognize the specific sequence containing the SNP to cut the DNA fragment into two smaller pieces.

These cleaved amplified polymorphic sequence (CAPS) markers can be visualized on an agarose gel thus allowing the researcher to identify individuals containing the SNP sequence. This conversion of the SNP into a marker is very useful for use across different populations and germplasm sources because they are very sequence specific and co-dominant in nature thus providing data on heterozygosity.

Initially, we designed 50 primer sets for single or paired SNPs that also are located within a restriction site. The 50 primer sets are being tested for amplification and transference to the test population WSU1499 x "Newburgh". Once fully screened, the markers will be compared to data on resistance to raspberry bushy dwarf virus (RBDV) to further isolate the region of the genome where the resistance gene is located. This process is ongoing and will be completed by the term date of the project, February 28, 2011.

This project was one of six projects funded in 2010 by the North American Bramble Growers Research Foundation. For more information about this work contact Courtney Weber at caw34@nysaes.cornell.edu. For more information about the Foundation , visit www.raspberryblackberry.com

Fumigant Suppliers Merge as TriEst Ag Group

Article from The Strawberry Grower

Reddick Fumigants, Hendrix & Dail, and Hy-Yield Products, all of whom are long-time suppliers of fumigation products and services to strawberry growers and others in our region – and beyond – have merged to form TriEst Ag Group.

The decision evolved from the challenges facing the fumigation industry, including limited and declining methyl bromide supply and increased regulations. Noted Victor Lilley of Reddick Fumigants, "Through this action we will be able o service our customers more thoroughly and help ourselves and our growers navigate the challenges we face. We also feel this will allow for a more sustainable future for our customers and employees than we could offer otherwise."

TriEst Ag Group Inc. has offices in Greenville NC, Williamston NC, Rocky Point NC, Tifton GA, Palmetto FL, and Plant City FL and is in the process of working out the operational details of the merger. Growers who worked with any of the three companies in the past will be able to continue these same Relationships.

"For more information, contact Victor Lilley at vlilley@triestag.com ."

Ohio MARKETING CONNECTIONS

About Marketing Connection

Whether you are in the exploration stage or ready to grow an existing venture , this site provides the connections you need for your business. Ohio Marketing Connections brings you easy access to direct marketing resources thanks to the contributions of numerous collaborators on the Ohio Direct Marketing Team. Great things are happening in Ohio—be a part of it!

Marketing Connections was developed through the Ohio Direct Marketing Team - a group of representatives from across the state. The Ohio State University Extension provides leadership for this team. The team advances economic development in Ohio through collaborative research and education projects.

Key partners include Ohio State University Extension, Ohio Proud/Ohio Department of Agriculture, Our Ohio/Ohio Farm Bureau Federation, and the Center for Innovative Food Technology.

Check out the website for more information at:

http://directmarketing.osu.edu/index.html

Ohio provides plenty of economic opportunities for direct marketing. Ohio is one of the most urbanized states in the country, yet retains over half its land base in agricultural uses (Clark, Sharp, Irwin & Libby, 2003). Seventy-three (73%) of all urban land cover in Ohio is located within 5 miles of a highway (Reece & Irwin, 2002). This, combined with growing interest in local foods and other local products, presents unique marketing opportunities. Since market systems are rarely defined by state boundaries, it is also significant that Ohio is conveniently located to North America's most lucrative and diverse markets.

Apple Rootstocks and Cultivars eXtension Project

Dr. Rich Marini, Head of the Department of Horticulture
Penn State University
Article from Fruit Times - Volume 30 Number 1—January 2011

Orchard owners and home gardeners looking for the best answers to their questions about apple trees soon will have free, easy access to all the information they need, thanks to a land-grant university project funded by the U.S. Department of Agriculture.

eXtension is an interactive online learning environment that delivers researched-based knowledge developed by the nation's land-grant university experts. Penn State University is a major contributor to eXtension. The new eXtension portal will be named "The Community of Practice (CoP) for Apple Rootstocks and Cultivars."

History of eXtension

In 2001 a decision was made at the national level to transform the way Cooperative Extension delivers information through technology. After a few years of developing the administrative structure for the system, in 2004 The Cooperative Extension system adopted an assessment to provide project start-up funds for several years and in 2005 a prototype was introduced. In 2007 the full system was launched to provide access to the land-grant university system with rules of operation, governing committee, staff and long-term implementation plan.

Most fruit growers are familiar with the regional project NC- 140, which evaluates rootstocks and NECC-1009, formerly NE-183, which evaluates apple cultivars. These projects have been very successful and most recommendations in North America are based on results from these two projects. Summaries of these projects are presented at grower meetings, newsletters and trade journals, but growers in non-cooperating states may receive limited information. Data are summarized in detail in scientific journals, but most nursery operators, growers, and consumers do not have access to these publications. In 2009 a subset of NC-140 cooperators wrote a successful eXtension proposal, which is funded through the Specialty Crop Research Initiative. Our goal is to develop a web-based information system to summarize the tremendous amount of information we have generated for apple rootstocks and cultivars. Tools will be developed to help several stakeholder groups, including nursery operators, fruit growers, county educators, Master Gardeners, and home gardeners to make decisions concerning rootstocks and cultivars. This project is focused on the eastern U.S. because western growing conditions are different than in the East.

The Apple Rootstock and Cultivar Project

The first step was to develop a Community of Practice (CoP). The project is led by researchers at the University of Minnesota and Penn State University, with assistance from co-leaders from West Virginia University, University of Massachusetts, University of Missouri, North Carolina State University, Cornell University and The Ohio State University. Members from Penn State include Rob Crassweller and Rich Marini, Department of Horticulture and Daniel Foster, Department of Agricultural & Extension Education.

We have monthly virtual meetings, using Adobe Connect or Skype, and we have one face-to-face meeting each year. We are also organizing an advisory committee of nursery and orchard representatives to help evaluate our products as they are developed and to provide suggestions to make the system more user-friendly. In November 2010 we met in conjunction with the NC-140 technical committee and identified the types of information we want to include on our website. Web development specialists at the University of Minnesota have been providing guidance to help us develop these products. Part of this process was to develop 50 FAQs for rootstocks and we will do the same for cultivars. These are ―Commonly Asked Questions ‖ about rootstocks along with answers to the questions and the answers will be reviewed by members of the CoP before the site is launched. This peer-review process will provide quality control. We are also developing a large collection of pictures related to rootstocks and cultivars. Over the next two years we plan to develop videos and searchable data bases to go along with the pictures and user-friendly interactive products to provide location-specific information about rootstocks and cultivars. We expect that over time the CoP will expand to include other apple-producing regions, additional aspects of production, and complementary consumer information.

Continued from Page 15: Apple Rootstocks and Cultivars eXtension Project

Dr. Rich Marini, Head of the Department of Horticulture
Penn State University
Article from Fruit Times - Volume 30 Number 1—January 2011

Another aspect of this project is to conduct a needs assessment to determine what types of information our audience wants and which formats would be useful. To obtain these types of information a survey was developed and this survey will be distributed to growers at winter meetings. So those of you attending the Mid-Atlantic Fruit & Vegetable Conference will be asked to complete this survey – it should only take about 10 minutes. The information will be summarized and interpreted at Penn State University, and we will be able to use this information to determine what types of information growers feel are important, where they currently get their information and we will be able to compare results from different production areas and different demographic groups. Once the information is developed and disseminated among the stakeholder groups, a program evaluation will be conducted. The stakeholder groups will again be surveyed to determine if the desired information has been adequately disseminated, is easily understandable, and is in an accessible format. During the next decade a lot of pomological expertise will be lost to retirement and without a national effort to archive our collective knowledge, the information will be lost. We are excited about this opportunity to develop a new method of summarizing and delivering information in a way that can easily be updated as new information becomes available. To be successful, we will need cooperation from nurserymen and apple growers, so we hope you will be willing to participate in our surveys this winter. You can learn more about the eXtension program at http://about.extension.org/.

2009 CENSUS OF AGRICULTURE

2009 Census of Horticultural Specialties

The 2009 Census of Horticulture counted 21,585 operations in the United States with sales of $10,000 or more in horticultural specialty crops, a decrease of 2,173 operations since the 1998 Census of Horticulture. Sales of horticultural crops only increased by 10 percent over this period, compared to a 60 percent increase for all crop commodities[1].

Categories where sales increased more than average include food crops grown under cover, bedding plants, nursery stock and propagative materials. Categories with a lower than average change in sales include sod, potted flowering plants, cut Christmas trees, dried bulbs, cut flowers and cut cultivated greens.

	2009 Value of Sales	1998 Value of Sales	% Change
All Horticultural Crops	$11.7 billion	$10.6 billion	+10.3
Nursery Stock	$3.9 billion	$3.1 billion	+24.3
Annual Bedding/Garden Plants	$2.3 billion	$1.7 billion	+33.3
Sod, Sprigs or Plugs	$877 million	$835 million	+5.0
Potted Flowering Plants	$871 million	$868 million	+0.4
Herbaceous Perennial Plants	$844 million	$627 million	+34.5
Propagative Materials	$602 million	$493 million	+22.0
Food Crops Grown Under Protection	$553 million	$223 million	+148.5
Foliage Plants	$510 million	$595 million	-14.3
Cut Flowers	$403 million	$513 million	-21.3
Transplants for Commercial Vegetable Production	$331 million	$156 million	+111.6
Cut Christmas Trees	$250 million	$256 million	-2.5

[1]U.S. Department of Agriculture, Economic Research Service. *Farm Income and Balance Sheets, 1929-2010.*

U.S. Department of Agriculture

National Agricultural Statistics Service

USDA AGRICULTURE COUNTS NASS

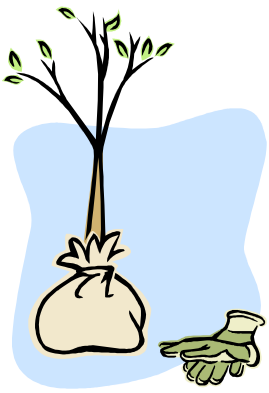
www.agcensus.usda.gov

2009 CENSUS OF AGRICULTURE

Expenses

The single largest expense for horticultural specialty operations is hired labor, which includes salaries paid to hired workers, as well as benefits for workers. Horticultural operations employed 280,201 hired workers in 2009. Hired labor expenses were more than twice the amount of the next largest expense, which was for seeds, plants, vines and trees. Other significant production expenses included the expense for containers, which includes pots and flats, and for gasoline, fuels and oils.

Top 5 Horticulture Production Expenses	Total Cost (Billions)	% of Total Expenses
Total Hired Labor Expense	$3.61	38.1
Seeds, Plants, Vines, Trees, Etc.	$1.48	15.6
All Other Production Expenses	$0.62	6.6
Total Containers Expense	$0.49	5.2
Gasoline, Fuels and Oils Purchased	$0.46	4.9



East Central Ohio Fruit and Vegetable Growers Winter Update

Friday, February 25, 2011

Dawes Arboretum

7770 Jacksontown Road, SE, Newark Ohio

(S.R. 13)

5 miles south of Newark - 4 miles north of Thornville

8:30 A.M.	Registration		
9:00 A.M.	Integrated Pest Management in Pumpkins—Disease and Insect Management ~~ Jim Jasinski, OSU Extension Educator		
	FRUITS		**VEGETABLES**
10:00 A.M.	Growing Large Sized Apples—A New Understanding of Apple Fruit Growth *Peter Hirst, Purdue University, Fruit Specialist*	10:00 A.M.	Results of Ohio's Evaluation of Vegetable Varieties *Bob Precheur, OSU Vegetable Specialist*
11:00 A.M.	Tree and Small Fruit Disease Update *Mike Ellis, OSU Plant Pathologist*	11:00 A.M.	Virtual Tour of Farmer's Markets in New York *Hal Kneen, OSU Extension Educator*
12 noon	Lunch	12 noon	Lunch
1:00 P.M.	Orchard Systems for Direct Sales *Peter Hirst, Purdue University, Fruit Specialist*	1:00 P.M.	Vegetable Insect Management Update *Celeste Welty, OSU Entomologist*
2:00 P.M.	Fruit Insect Management Update *Celeste Welty, OSU Entomologist*	2:00 P.M.	Disease Management in Tomatoes and Peppers *Hal Kneen, OSU Extension Educator*
3:00 P.M.	Adjourn	3:00 P.M.	Adjourn

Information displays will be available from **Greenstar Cooperative and Crop Protection Services** throughout the day.

Sponsored by: Ohio State University Extension, Licking and Muskingum Counties

$15 per person for registration ~ includes lunch

Phone reservations to OSU Extension—Licking Co. @ 740-670-5315 OR OSU Extension-Muskingum Co. @ 740-454-0144

Financial Assistance for the program provided by: ■ Greenstar Cooperative ■ Crop Protection Services ■ Zanesville Farmers Market

MAP ON BACK