Ohio Fruit ICM News

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In This Issue

Calendar - Newly added in ***Bold***

February 11, Fruit Production School - Licking County Extension, Newark, Ohio. The three hour morning session will address "Grape Production -- Table and Wine" and the afternoon program will present information on "Bramble Production -- Raspberries and Domestic Blackberries". Participants may register for one or both of the sessions. Each session is $20.00 for the resources and materials. Dr. Dick Funt, OSU Professor, Emerti is the instructor. Each session will address soil site selection, soil amendments, irrigation, establishment procedures, plant spacings and pest management in the first three years. Additional information and registration may be accomplished by emailing siegrist.1@osu.edu.

February 12-14, Ohio Grape-Wine Short Course, Wilmigton, OH. People can register through the OWPA website http://www.ohiowines.org/

February 15, Southwest Ohio Fruit and Vegetable School**.** Valley Vineyards and Winery, Morrow, Ohio. For additional information contact Vickie Butler 513-732-7070.

February 15-16, Ontario Fruit & Vegetable Convention at Brock University campus in St. Catharines, Ontario. For more information, call 1-800-387-3276

Feb. 21-22, Ohio River Valley Farm Marketing Conference, Clifty Falls State Park, Madison, IN. The conference will address: assessing and evaluating new market opportunities, market development, and marketing for value-added agriculture. Registration $40 before 2/6/06. Contact Sharon Ellison 317-290-3100 x 429, e-mail: Sharon.ellison@in.usda.gov

February 22-25, Mid Atlantic Direct Marketing Conference. This year's 4 day event is being hosted near Reading, PA. For those interested - additional info can be found at <www.madmc.com/>

February 25, Fruit Tree Pruning Workshop, Spring Hill Orchard 5646 Ganges Five Points Rd., Shiloh OH. A "hands-on" pruning workshop which will be of interest to both the amateur and commercial grower. Registration will be from 9:30-10:00, (no charge!). Program from 10-noon. Please RSVP to OSU Extension Office of Richland County 419-747-8755 if you are planning on attending.

February 26 - March 1, 49th Annual International Fruit Tree Association Educational Conference**,** Hershey, Pennsylvania. Form more information <http://www.idfta.org/ >

Mar. 7-8, Illinois Small Fruit and Strawberry School, Mount Vernon Holiday Inn, Mount Vernon, IL. Contact Elizabeth Wahle. phone: 618-692-9434 or Bronwyn Aly phone: 618-695-2444.

March 24, Building on Your Success as a Family Business, Holiday Inn Express, 1392 Enterprise Highway, Ashland OH. A one-day interactive discussion program for multi-generational businesses. Preparing and transferring management responsibilities to the next generation. Topics will include: What Managers Do & Why, Getting the Next Generation Ready, Creating Opportunity, Sharing Responsibility, Communication, and Being Honest About Ourselves and Our Business. For more information go to http://ashland.osu.edu/ag/building.pdf, or call Julia Nolan Woodruff at 419-281-8242.

March 30, Lake Erie Grape Growers Convention, Fredonia State University, Fredonia, NY < http://lenewa.netsync.net/public/events03.htm >

Apr. 22, Kentucky Nut Growers' Association Spring Meeting, Elizabethtown Extension office, Elizabethtown. Contact: Kirk Pomper 502-597-5942, e-mail: kpomper@dcr.net

Comments from the Editor

Thank you to those of you who have taken the few minutes required to complete the survey. The survey is still active, and if you haven't completed it **please** do so. Without your feedback it is difficult for me to justify to administration that this is necessary and wise use of my time.

Some of the sites that Ted Gastier used for weather data are no longer available for free. I am attempting to resolve this issue.

Two of the articles in this issue had tables or figures that did not incorporate into the text version, but they are available in the attached PDF. If you need to get the free Adobe Reader, click on this link < FREE Adobe Reader > and download the free reader.

Survey

The contributors to the Ohio Fruit ICM News are very interested in reader suggestions, comments and thoughts and we strive to provide our readers with unbiased, timely, accurate, and useful information. Please take 10 minutes of your time to complete this **anonymous** survey by clicking on the following link

http://www.zoomerang.com/survey.zgi?p=WEB224XNPWWJ78

Thank you for your participation. It is with your input that we can continue to provide a high-quality, useful newsletter.

POST-INFECTION CONTROL OF FLYSPECK WITH NEW FUNGICIDES

David A. Rosenberger and Frederick W. Meyer
Cornell University's Hudson Valley Laboratory, Highland, NY 12528

Objectives:

1. Determine post-infection activity of Topsin M, Sovran, Flint, and Pristine against flyspeck when treatments were applied within 350 hr of accumulated wetting from petal fall (AWPF) as compared to effectiveness when the same applications were delayed until approximately 450 hr AWPF.
2. Determine if liquid-lime sulfur can be used as a post-infection fungicide to control flyspeck.

Methods:

Treatments were replicated four times using single-tree replicates in a randomized block design in an 8-yr-old orchard containing Golden Delicious on MM.111 rootstocks with M.9 inter-stems. Treatments were applied to drip using a handgun and a high-pressure sprayer set at 200 psi. Cedar trees were planted between plots within rows to minimize drift between plots. Early season fungicides were applied to trees in these plots to prevent scab, rust, and mildew. The last two fungicide applications prior to initiation of this test were, with rates per acre, Bayleton 50W 5 oz plus Penncozeb 75DF 3 lb on 30 May and Bayleton 50W 4 oz plus Captan 80WDG 2 lb on 8 June. A total of 2.25 inches of rainfall between 10 and 18 June removed fungicide residues from the 8 June spray before trees reached 270 hr AWPF on 29 June, the time when the first conidia of the flyspeck fungus were presumably released from infections in the orchard perimeter. The test block has poor air drainage and is surrounded by hedgerows and woodlots on three sides.

Our assumption at the start of this trial was that flyspeck ascospores are released beginning at about petal fall, but that the ascospores are of relatively minor importance on apples. Ascospores infect other hosts in orchard perimeters and those primary infections produce conidia that are blown into orchards starting at about 270 hr AWPF. Based on prior trials, we assumed that fungicides with limited systemic activity can inactivate flyspeck during its initial stages of growth on apples so long as the fungicide is applied before 100 hr of wetting accumulates between infection and the time that fungicides are applied. Therefore, in this trial we opted to apply the same fungicide treatments at approximately 350 hr AWPF on the assumption that this timing would provide excellent control of flyspeck. (We chose 350 hr AWPF with the objective of allowing 270 hr for the primary infections on perimeter hosts plus 80 hr of incubation for the first conidia to reach apples.) Most of these treatments were repeated at 430 hr AWPF

on the assumption that the fungicides would not control flyspeck when applied more than 100 hr after conidial infections were initiated on fruit. Captan was included as "control" because we assumed that, as a contact fungicide, captan would not provide post-infection activity. Liquid lime-sulfur was included as a potential fungicide for organic farmers based on the comment from an organic farmer in New England who reported that a single spray during mid-summer was very effective. After test plots received their initial spray on either 11 or 26 July, trees were re-sprayed at regular intervals so as to avoid the possibility that infection visible at harvest might have originated with lapses in fungicide protecting during late summer or fall. We assumed that most of the test fungicides would protect fruit for either 21 days or until 1.5 inches of rainfall had accumulated since the last application. Lime sulfur was applied only twice and was followed by an application of Topsin M plus Captan because we were uncertain if lime-sulfur would provide residual protection comparable to other treatments.

None of the treatments provided complete control of flyspeck. Flyspeck incidence in control plots (no fungicide after 8 June) increased rapidly from 8.5% on 15 Aug (516 hr AWPF) to 46% on 18 Aug (538 hr AWPF) and to 77% on 23 Aug (554 hr AWPF). Fruit in plots treated with captan alone at either spray timing reached 46-48% infection by 12 Sep, approximately 25 days after disease incidence in the control plots had reached that level. By 19 Sep, disease incidence exceeded 10% in all treatments.

Comparisons of disease progress is the various treatments (Fig. 1) suggested that disease development in all of the treatments followed the same general pattern, but some fungicides slowed development more than others. Because the summer was relatively dry and fungicides were timed to prevent any subsequent infections from occurring after the first summer spray was applied, the flyspeck observed in this trial indicates that all of the fungicides tested are fungistatic rather than fungicidal when applied to pre-existing infections. The period of fungistasis was shortest for captan and longest for Sovran. In plots where no treatments were applied until 430 hr AWPF, flyspeck infections had progressed further before fungicides were applied and disease progress was therefore slightly advanced (a higher incidence on any given date) for most of the fungicide treatments. Lime sulfur suppressed early development of flyspeck more effectively than any of the other fungicides, but we did not have room in the orchard to include a lime sulfur treatment initiated at 430 AWPF.

The incidence of red lenticel spots (presumed lenticel infections by *Botryosphaeria* species) was significantly higher were treatments were first applied on 26 July as compared to where treatments were applied on 11 July.

Results from this experiment suggest that fungicides for summer disease control should be initiated at approximately 250 hr AWPF. Leaving trees unsprayed until later in the summer resulted in unacceptable development of flyspeck and red lenticel spotting prior to harvest. The rapid increase in flyspeck incidence in late summer after fungistasis from post-infection sprays had dissipated parallels observations in commercial orchards where flyspeck sometimes appears unexpectedly in orchards where fruit had less than 270 hr accumulated wetting after fungicide residues were removed by September rains. Based on observations in this trial, it seems likely that such episodes occur when lapses in mid-summer fungicide protection allow flyspeck infections to occur during summer, the incubating infections are suppressed by later fungicide application, and flyspeck then resumes growth and appears on fruit when residues from the last summer spray are depleted.

Acknowledgments:

The authors thank Anne Rugh, Richard Christiana, Sr., and Albert Woelfersheim for technical assistance in carrying out the trial reported here. We also thank the fungicide manufacturers for providing product for testing.

Material and rate of formulated product per 100 gal	Spray timing (11 Jul = 337 hr AWPF[1]; 26 Jul = 430 hr AWPF)	% Golden Delicious with flyspeck:[2] hr AWPF as shown below the dates: 23 Aug 554 hr	30 Aug 611 hr	6 Sept 647 hr
1. Control [3]		76.7 d[4]	98.3 e	100.0 d
2. Captan 80W 10 oz	11 Jul, 29 Jul, 19 Aug	6.7 bc	35.8 d	30.0 c
3. Captan 80 W 10 oz + Topsin M 4 oz	11 Jul, 29 Jul, 19 Aug	1.7 ab	9.2 bc	2.5 a
4. Flint 50W 0.67 oz	11 Jul, 29 Jul, 19 Aug	2.5 ab	3.3 ab	8.3 ab
5. Sovran 50W 1.33 oz	11 Jul, 29 Jul, 19 Aug	0.8 a	4.2 ab	8.3 ab
6. Pristine 38WDG 4.8 oz	11 Jul, 29 Jul, 19 Aug	2.5 ab	3.3 abc	4.2 ab
7. Liquid lime sulfur 1 gal Captan 80W 10 oz +Topsin 4 oz	11 Jul, 29 Jul 19 Aug	1.7 ab	0.0 a	2.5 ab
8. Captan 80W 10 oz	26 Jul, 19 Aug	19.2 c	45.0 d	35.8 c
9. Captan 80 W 10 oz + Topsin M 4 oz	26 Jul, 19 Aug	5.8 ab	10.8 c	10.8 b
10. Flint 50W 0.67 oz	26 Jul, 19 Aug	1.7 ab	2.5 ab	3.3 ab
11. Sovran 50W 1.33 oz	26 Jul, 19 Aug	2.5 ab	0.0 a	5.0 ab
12. Pristine 38WDG 4.8 oz	26 Jul, 19 Aug	5.8 ab	6.7 bc	9.2 ab

See footnotes below the next table.

Material and rate of formulated product per 100 gal	% Golden Delicious fruit with flyspeck[2] with hr AWPF as shown below the dates: 12 Sept 663 hr	Sept 19 720 hr	Sept 26 750 hr	Oct 3 841 hr
1. Control [3]	100.0 e	100.0 d	100.0 d	100.0 e
2. Captan 80W 10 oz	48.3 d	68.3 c	88.3 c	85.3 d
3. Captan 80 W 10 oz + Topsin M 4 oz	11.7 bc	20.0 ab	30.8 ab	23.4 a
4. Flint 50W 0.67 oz	5.0 ab	17.5 ab	29.2 ab	39.2 bc
5. Sovran 50W 1.33 oz	8.3 b	14.2 ab	19.2 a	24.2 a
6. Pristine 38WDG 4.8 oz	6.7 b	16.7 ab	33.3 ab	27.7 ab
7. Liquid lime sulfur 1 gal Captan 80W 10 oz +Topsin 4 oz	0.0 a	6.7 a	23.3 ab	29.5 a
8. Captan 80W 10 oz	46.7 d	75.0 c	88.3 c	90.9 d
9. Captan 80 W 10 oz + Topsin M 4 oz	21.7 c	21.7 ab	44.2 b	39.5 bc
10. Flint 50W 0.67 oz	5.0 ab	15.8 ab	30.8 ab	40.5 bc
11. Sovran 50W 1.33 oz	9.2 b	10.0 a	24.2 ab	29.8 ab
12. Pristine 38WDG 4.8 oz	20.8 c	31.7 b	35.0 ab	48.4 c

[1] hr AWPF = hr accumulated wetting counting from petal fall.

[2] 30 random apples per tree were rated for presence of flyspeck. Apples were rated on the tree except for the 5 October rating when apples were rated after harvest.

[3] Control trees were evaluated on a weekly basis beginning 25 Jul. Flyspeck incidence in controls was 1% on 25 Jul, 1% on 1 Aug; 1% on 8 Aug at 466 hr AWPF, 8.5% on 15 Aug at 516 hr AWPF, and 46% on 18 Aug at 538 hr AWPF.

[4] Means followed by the same letters are not significantly different (Fisher's Protected LSD, $P \leq 0.05$). The arc-sine transformation was used for statistical analyses, but arithmetic means are shown in the table.

Material and rate of formulated product per 100 gal.	% Golden Delicious fruit harvested 3 Oct 05 with sooty blotch	Out of grade due to SBFS	*Botryosphaeria* sp. fruit rot	red lenticels	Lime-sulfur chemical burn
Control	100.0 c	100.0 e	3.3 a	22.6 c	0.0 a
Captan 80W 10 oz	43.9 b	61.1 d	3.0 a	14.6 bc	0.0 a
Captan 80W 10 oz + Topsin M 70WSB 4 oz	6.6 a	6.3 ab	0.6 a	5.5 a	0.0 a
Flint 50WDG 0.67 oz	7.7 a	12.6 bc	1.3 a	11.3 ab	0.0 a
Sovran 50W 1.33 oz	2.0 a	5.0 ab	0.7 a	5.3 a	0.0 a
Pristine 38WDG 4.8 oz	5.0 a	4.7 ab	1.4 a	9.4 ab	0.0 a
Liquid Lime Sulfur 4 qt Captan 80W 10 oz +Topsin 4 oz	1.6 a	2.6 a	1.3 a	13.0 abc	4.9 b
Captan 80W 10 oz	52.9 b	67.0 d	12.1 a	20.3 bc	0.0 a
Captan 80W 10 oz + Topsin M 70WSB 4 oz	4.2 a	12.1 bc	2.7 a	16.4 bc	0.0 a
Flint 50WDG 0.67 oz	7.0 a	10.3 abc	2.0 a	16.7 bc	0.0 a
Sovran 50W 1.33 oz	5.6 a	7.2 abc	1.6 a	17.9 bc	0.0 a
Pristine 38WDG 4.8 oz	5.0 a	16.3 c	3.3 a	15.6 bc	0.0 a

Means followed by the same letters are not significantly different (Fisher's Protected LSD, $P \leq 0.05$). The arc-sine transformation was used for statistical analyses, but arithmetic means are shown in the table.

Results of two-way analyses (five fungicide treatments X two application timings) for effects of treatments and spray timing on the incidence of flyspeck and red lenticel spots at harvest.

Materials and rate of formulated product per 100 gal	% Golden Delicious fruit harvested 3 October 2005 with flyspeck Initial spray date 11 Jul	26 Jul	Grand means: fungicides	with red lenticels Initial spray date 11 Jul	26 Jul	Grand mean for material
Captan 80W 10 oz	85.4 c	90.9 c	88.1 c	14.6	20.3	17.5
Captan 80W 10 oz + Topsin M 70WSB 4 oz	23.4 a*	39.5 ab	31.5 ab	5.5*	16.4	10.9
Flint 50WDG 0.67 oz	39.2 b	40.5 ab	39.9 b	11.3	16.7	14.0
Sovran 50W 1.33 oz	24.2 ab	29.8 a	27.0 a	5.3*	17.9	11.6
Pristine 38WDG 4.8 oz	27.7 ab*	48.4 b	38.1 b	9.4	15.6	12.5
Grand mean for spray date	40.0 A	49.8 B		9.2 A	17.4 B	

Means within columns followed by the same letters are not significantly different ($P \leq 0.05$) as determined from a 2-way analysis of five fungicide treatments tested at two different timing intervals. The arc-sine transformation was used for statistical analyses, but arithmetic means are shown in the table. Asterisks following simple means indicate that a significant difference exists between dates for the fungicide treatment in that row.

P-values for analysis of flyspeck: Fungicide =<0.001, Spray date =0.004, Fungicide* Spray date = 0.363.
P values for red lenticels: Fungicide = 0.289, Spray date =0.002, Fungicide* Spray date = 0.622

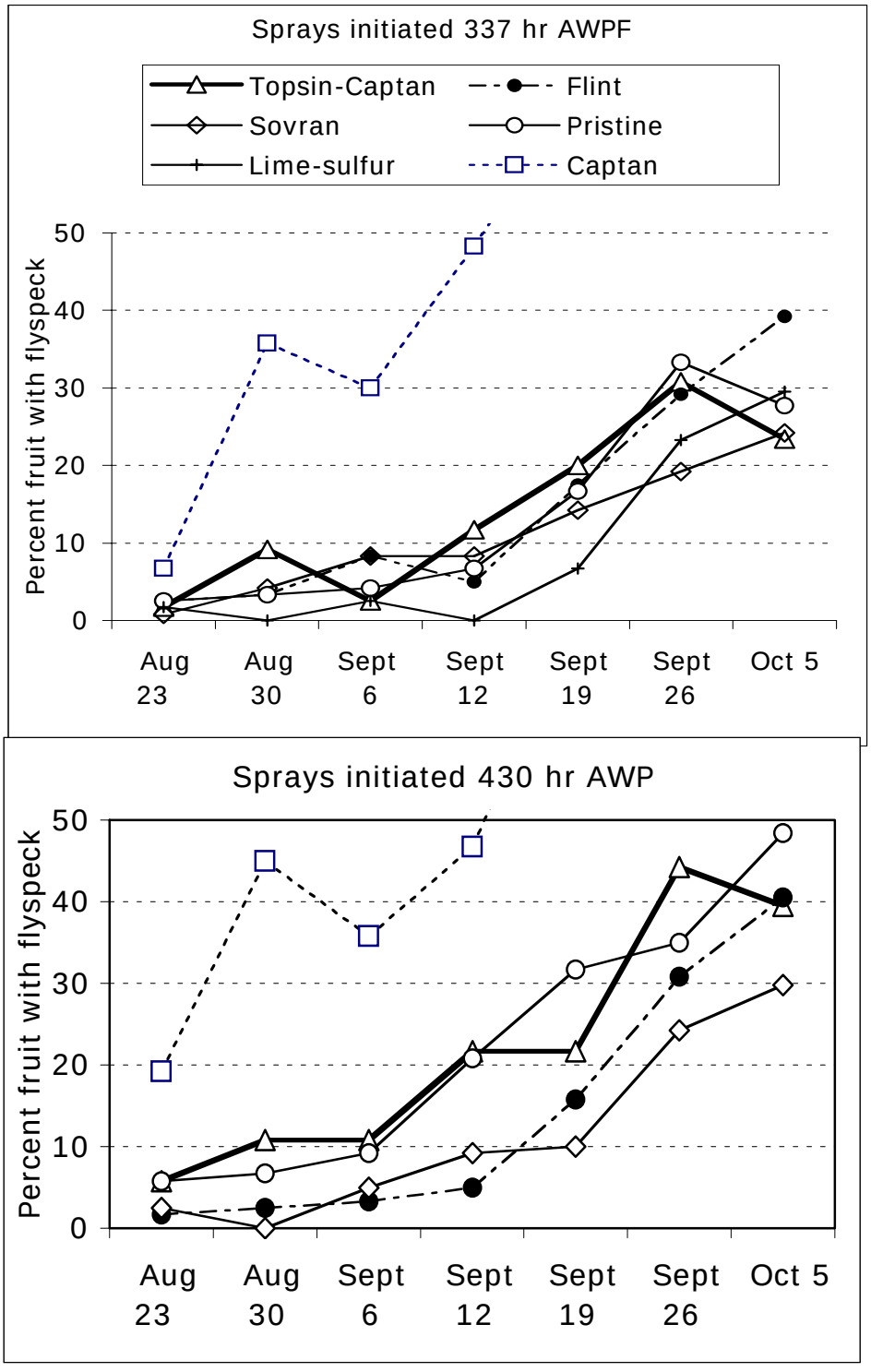


Fig. 1. Incidence of flyspeck on Golden Delicious fruit at various dates as effected by fungicide treatments initiated on 11 July (337 hr AWPF) or 26 July (430 hr AWPF).

A Winter Protection System for Blackberries

Dr. Fumiomi Takeda, Appalachian Fruit Research Station, U.S. Department of Agriculture, Agricultural Research Service, Kearneysville, WV 25430.

Low temperature injury has limited the expansion of blackberry production into more northern latitudes. For example, there are no cold hardy thornless cultivars that produce consistently under a New England or Midwest winter condition. At "rest", dormant blackberry buds can withstand temperatures as low as –9.5 ºF. After rest completion, blackberries de-acclimate rapidly and can resume growth with exposure to warm temperatures. De-acclimated buds are far more susceptible to low temperature injury.

The study performed at the Appalachian Fruit Research Station, Kearneysville, WV (39º Latitude N) included two trailing ('Siskiyou' and 'Boysenberry') and two semi-erect ('Apache' and 'Triple Crown') blackberries. After training canes onto the rotatable cross-arm (RA) trellis, the plants were then covered with a fabric (floating row cover) alone or with the floating row cover (FRC) and polyethylene plastic (PE) sheet together from early December to early March (Fig. 1B). The canes remained in the horizontal position until bloom, encouraging flowering laterals to grow upright. After bloom, the cross-arms were raised and pushed beyond vertical or about 70 degrees above horizontal (Figs. 1C and 1D). This positioned the fruit on one side of the row and allowed the newly emerged primocanes to be tied to the training wire.

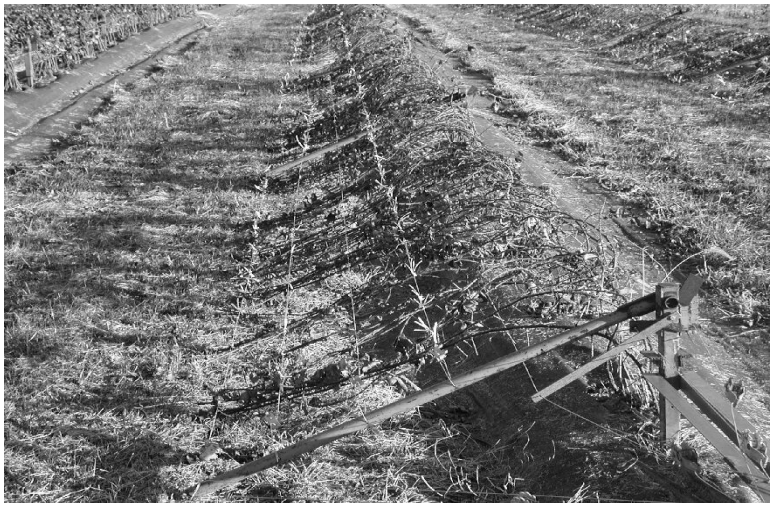
The results of our study showed that 'Apache' and 'Triple Crown' blackberries did not benefit from winter protection covers. The minimum daily temperatures remained above 0 °F from December 2004 to March 2005. Normally erect cultivars do not show winter damage until the temperature drops below -4 °F. In January and February 2005, the daily minimum temperatures under the FRC+PE cover treatment were about 6 ºF higher than in the open. The FRC and FRC + PE covers may also have protected canes against the wind and desiccation.

In trailing blackberries, tissue damage in plants protected with a FRC+PE cover was significantly less than for unprotected plants. In 'Siskiyou' blackberry, more than 90% of the axillary buds on lateral canes were killed in unprotected plants compared to only 20% in plants covered with FRC + PE. 'Siskiyou' plants that were not protected produced less than 3 lbs. of fruit per plant compared to about 10 lbs. in plants that were covered with FRC alone or in combination with PE. More fruit were harvested from 'Boysenberry' blackberries that were protected compared to plants in the open. But, the fruit of 'Boysenberry' had poor drupe development especially among those at the distal end. 'Siskiyou' plants that were covered in winter started to flower much earlier compared to unprotected plants, thus harvesting started on June 20 during the red raspberry harvest season or two to three weeks earlier than that for 'Triple Crown' eastern blackberry.

Will these rather simple production modifications allow blackberries to be grown successfully in northern states? Higher capital investment on the trellis material can off-set labor needs and raise crop productivity. We have shown that the RCA trellis system can be used to manipulate the canes with little cane breakage and position fruit to improve harvest efficiency. Whether incorporating this trellis system for blackberry production in northern states will be successful depends on its profitability. For example, the price structure for fresh blackberries in New Hampshire is good (>$3.00/pint) (William Lord, personal communication). Additional field trials will be conducted in Maine, New Hampshire, and Utah to evaluate alternative cultural techniques for improving the sustainability of blackberry production at sites with adverse winter conditions. For more information about the RCA trellis (e.g., material list and cost, line

drawings), and details on cane training technique, please contact the author (Tel: 304 725 3451. E-mail: ftakeda@afrs.ars.usda.gov). The author acknowledges Mr. Brent Rhoades of Circleville, OH for sharing his experiences in growing erect thornless blackberries.

Fig. 1. Photographs taken from winter protection studies conducted in 2004 and 2005. (A) The cross arms is rotated about a pivot point at the top of the post. Note canes are tied down and the cross-arms are in their winter position. (B) Protected covers are placed over some plants. (C) 'Siskiyou' plants that were not protected. Note spring growth is absent on floricanes. (D) 'Siskiyou' plants that were protected with a floating row cover. Lateral canes are full of fruit.



A.

B.

C.

D.

Plant Phenology - Dan Herms, Associate Professor, Entomology OARDC Wooster, Denise Ellsworth, OSU Stark Co.

Phenology is the study of recurring biological phenomena and their relationship to weather. Bird migration, hunting and gathering seasons, blooming of wildflowers and trees, and the seasonal appearance of insects are examples of phenological events that have been recorded for centuries. We have all observed that plants bloom earlier in warm springs. Insects also emerge earlier when it is warm than in cooler seasons. Because the development of both plants and insects is temperature dependent, plants can accurately track the environmental factors that determine when insects are active. The development is correlated with the accumulation of growing degree days (GDD). For this reason, plant phenology can be used to predict insect emergence. Indeed, the use of plant phenology to predict insect activity is an old practice, with recorded observations dating back at least 300 years. In fact, research at The Ohio State University has shown that plants bloom and insects emerge in virtually the same order every year, no matter what kind of weather occurred that winter or spring. For this reason, the flowering sequence of plants can be used as a biological calendar to predict insect activity, and to time other gardening practices that are dependent on a particular stage of plant development, such as propagation or weed control. The trees and shrubs planted in the OSU Phenology Garden network sites will be monitored for the first and full bloom, which will assist with identifying insect activity. To check this site please click here <http://phenology.osu.edu/>. A recent modification allows you to check the growing degree day accumulation at your site by entering your zip code < http://www.oardc.ohio-state.edu/gdd/ >. At some locations you can even check past GDD based upon date so that you can compare it to current GDD.

OARDC Weather Stations

In 1980, a network of automated weather stations was established in Ohio in a cooperative research effort between OARDC and Miami University. In 2002, USDA is setting up stations at nurseries, and OARDC is cooperating with them to make the data available online. These new stations (Avon, Perry and Madison) are updated every 15 minutes and the data is also present here in a graphical format. The purpose of this network was to obtain a geographically comprehensive and cohesive set of Ohio climatic data for research purposes. It is recognized that this data is also of interest to the public and is presented here as a public service for information only. Please note that these data are gathered automatically by computers and remote sensors and do not represent official U.S. Weather Bureau records. If you need official certified records, please contact the National Oceanic and Atmospheric Administration site. The network now consists of 15 stations, 13 of which are automated, and most of which are located at OARDC branch campuses. Instrumentation at the stations is consistent as are the data presented here. For more information regarding data availability, contact css-oardc@osu.edu.

Preliminary Monthly Climatologic Data for Selected Ohio Locations -.

January 2006

	Total GDD	January		Annual		Average Temperatures			
		Precip.	Normal	Precip.	Normal	High	Low	Monthly	Normal
Akron-Canton		3.15	2.49	3.15	2.49	44.7	31.1	37.9	20.2
Cincinnati									
Cleveland		1.92	2.48	1.92	2.48	44.8	32.3	38.6	25.7
Columbus		1.75	3.33	1.75	3.33	48.3	33.1	40.2	29.0
Dayton									
Fremont		3.12	2.35	3.12	2.35	44.3	25.9	35.1	23.9
Kingsville		2.26	1.98	2.26	1.98	44.1	30.3	36.7	27.5
Mansfield		2.74	2.63	2.74	2.63	44.1	30.7	37.1	24.3
Norwalk									
Piketon	46	4.01	3.13	4.01	3.13	51.5	32.5	41.7	30.8
Toledo		2.93	1.93	2.93	1.93	42.5	30.6	36.5	23.9
Wooster	17	2.16	3.03	2.16	3.03	46.1	31.2	37.9	26.6
Youngstown		2.71	2.34	2.71	2.34	43.9	29.7	36.8	24.9

This data is from several sources including OARDC, NOAA, and local records. Temperature is Fahrenheit and precipitation is in inches. GDD (growing degree days) modified sine wave method. Form more information on the calculation of GDD check this site < http://www.oardc.ohio-state.edu/gdd/glossary.htm >

Plasticulture Strawberry Advisory

If you are interested in plasticulture strawberry production, an excellent source of information is Dr. Poling's email advisory.

To subscribe
step 1 - send an email to: majordomo@ces.ncsu.edu
step 2 - put one line in the body of the message that says: subscribe berry-mg

To unsubscribe:
step 1 - send an email to: majordomo@ces.ncsu.edu.
step 2 - put one line in the body of the message that says: unsubscribe berry-mg

Ohio Poison Control Number

Hopefully you will never need this number, but keep it handy.

(800) 222-1222
TDD # is (614) 228-2272