

PLANT & PEST ADVISORY

FRUIT EDITION \$1.50

AUGUST 7, 2007



Sooty Blotch and Flyspeck

Bill Turechek and Dave Rosenberger, Ph.D's, Plant Pathology, NYAES, Geneva and Highland NY

Reprinted from SCAFFOLDS Fruit Journal, Geneva, NY, 2004. Volume 13, No. 15

Sooty blotch and flyspeck (SBFS) are two of the most important summer diseases of apple in New York and New Jersey. The diseases do not result in direct losses in yield, but rather they cause a reduction in fruit quality, which can lead to economic loss due to downgrading in fresh market fruit. Losses can exceed 25%, especially in warm humid climates such as those experienced in southeastern NY, southern New England, and the mid-Atlantic and southern states. Until recently, sooty blotch was thought to be caused by the fungus *Gloeodes pomigena*. However, recent studies have shown that sooty blotch is a disease complex caused by at least 3 different fungi: *Peltaster fruticola*, *Leptodontium elatius*, and *Geastrumia polystigmatis*. All three fungi are not necessarily present in all sooty blotch lesions. Flyspeck is caused by the fungus *Schizothyrium pomi* (= *Zygophiala jamaicensis*).

Symptoms

Sooty blotch appears as various shades of olive-green on the surface of the fruit. Colonies range in shape from nearly circular with distinct margins to rather large, amorphous blotches with diffuse margins. The variation in shapes and color can be attributed to the differences among the three fungi causing the disease and environmental conditions, specifically temperature and relative humidity. Fruit infection typically occurs in June and the first symptoms are generally apparent 20 to 25 days after infection, but can be visible as soon as 8 to 12 days after infection if conditions are warm and wet.

Flyspeck appears as distinct groupings of shiny, black fungal bodies (called thyriothecia) on the surface of the fruit. The number of thyriothecia associated with a single infection ranges from a few to over fifty. Although flyspeck thyriothecia appear to exist individually, close examination reveals mycelium connecting the individual structures. The primary spores are discharged starting around 2 weeks after petal fall and symptoms may be visible 10-12 days after infection under optimal conditions, but may not be visible for 1 month under less than ideal conditions. These primary

SEE SOOTY BLTOTCH ON PAGE 2

INSIDE

Sooty Blotch and Flyspeck ... 1

Weather and Fruit -
As I See it. 3

Food Safety Series:
Water Testing and Third Party
Audits 3

Fruit IPM 4

infections will give rise to conidia, which initiate secondary cycles of infection throughout the remainder of the season. Numerous observations in the field have shown that warm and wet or humid conditions are needed for the development of disease. For both flyspeck and sooty blotch, the causal fungi grow only within the wax cuticle of the fruit and are quite superficial. Rubbing the fruit with a cloth will often be enough to "clean-up" an apple that is only lightly affected.

Disease Management

Proper pruning and fruit thinning can have a huge impact on the effectiveness of fungicides used to control SBFS. In a 2-year study conducted in Massachusetts, Cooley et al. (1997) showed that summer pruning could reduce the incidence of flyspeck by nearly 50% in an unsprayed orchard. In the same study, they showed that the number of fruit downgraded from USDA Extra Fancy was reduced when summer pruning was done in commercial orchards. They concluded that summer pruning helped to decrease the incidence of flyspeck by reducing the number of hours of relative humidity >95% and allowing increased penetration of pesticides to the upper two-thirds of the canopy when applications were made with an airblast sprayer. Effective fruit thinning is also important for effective control of SBFS. When fruit are clustered together in groups of three or more, fruit surfaces in the middle of the cluster are slow to dry and become almost inaccessible to spray droplets as the fruit increase in size. Where necessary, hand thinning to break up fruit clusters will help to reduce the incidence of sooty blotch and flyspeck at harvest.

The primary means of managing sooty blotch and flyspeck is via fungicide applications during July and August. Four or five summer fungicide applications may be needed to control these diseases in wet years, whereas only two or three well-timed applications are needed in dry years. Fungicides applied to control scab and mildew at petal fall and first cover are usually adequate for protecting apples from flyspeck ascospores. In the northeast, the fungi causing sooty blotch are generally more sensitive to fungicides than is the flyspeck fungus, so flyspeck almost always appears first in orchards with marginal fungicide protection. Summer fungicides timed to control flyspeck will almost always provide adequate control of sooty blotch.

Following discharge of flyspeck ascospores during the 2-3 weeks after petal fall, the risk of flyspeck infection is relatively low until the time when ascospore-initiated infections in hedgerows and woodlots begin producing conidia for secondary spread of the flyspeck fungus. This seems to occur after about 250-280 hr of accumulated wetting after petal fall

(AW-PF) on apples. During this interval from 3 weeks after PF until 250 hr AW-PF, the risk of SBFS infection on apples is relatively low and fungicide coverage can usually be relaxed (provided, of course, that primary scab has been completely controlled). Beginning at 250 hr AW-PF, however, the risk of secondary flyspeck infections gradually increases until harvest.

Research has shown that Topsin M, Sovran, and Flint provide post-infection activity against sooty blotch and flyspeck. Their post-infection activity decreases as the time between infection and fungicide application increases. Although there are still some data gaps with Sovran and Flint, tests completed to date suggest that all three of these fungicides have reasonable activity against flyspeck infections if the fungicides are applied before infections are exposed to 100 hr of accumulated wetting. Working in North Carolina, Brown and Sutton (1995) showed that sooty blotch and flyspeck appear on fruit only after fruit are exposed to 275-300 hours of accumulated wetting following infection. Thus, it appears that Topsin M, Sovran, or Flint will provide post-infection control of flyspeck and sooty blotch so long as the infections are less than one-third of the way through the incubation period.

When Topsin M, Sovran, or Flint are used for July-August sprays, the period of relaxed fungicide coverage in June and early July can probably be extended until 350 hr AW-PF (250 hr for development of flyspeck conidia plus 100 hr of post-infection activity).

Even in dry years, however, trees should probably be protected with fungicides during the latter half of July because fungicide spray coverage later in the season may be compromised as apple size increases (thereby increasing contact surface areas between adjoining fruit) and as limbs bend down under crop load. Should a dry summer suddenly turn wet in August, SBFS could cause huge losses in orchards that were not protected prior to the rains.

Pre-determining the timing for the last SBFS spray in August or September is impossible because the need for additional sprays during that period is based on the weather.

Although an early September spray may be needed in exceptionally wet years, sprays applied during late August and September will not compensate for coverage gaps during July and August because none of our fungicides can completely eradicate SBFS after infections on fruit are older than 100 hr of accumulated wetting. **Therefore, sprays between early July and mid-August remain the most critical timing for controlling SBFS under NY conditions in most years. Earlier and later sprays are needed in wet years, but two or 3 applications between 15 July and 15 Aug are almost always essential.**

Submitted by Win Cowgill, Agricultural Agent. □

Weather and Fruit -As I See It

Win Cowgill, Agricultural Agent

The extremes in weather this summer have been a challenge- Maturity is very variable as compared to last year. Peaches at the Rutgers Snyder Farm are running 3-4 days behind last year while summer apples (Redfree, Pristine) are running 3-5 days ahead.

McIntosh type apples and other summer apples like Paulared are very poorly colored today as are Gala and Honeycrisp. Be cautious of fruit rots in apples with this heat as well as sunburn. I have used Surround clay on Honeycrisp for the past three years for assistance with Japanese Beetle control and the side benefit has been Sunburn control. With these 90°F days sunburn on exposed apple fruit can be a problem. Honeycrisp is such a week growing tree that the fruit is exposed. The rate I have used is 25lbs per 100 gallons at TRV dilute with a non ionic surfactant and repeat at 10-14 day intervals depending on rainfall.

With this hot humid weather maintain a tight fungicide schedule on maturing fruit that you will harvest in the next 2 weeks. I try to get three applications on the two weeks prior to harvest, with one a day or two before.

Maintain your irrigation scheduling with this hot weather, trees become stressed very easily with this heat, peaches put much of their size on the last two weeks.

Retain should have been applied to Macs, Gala and Honeycrisp by this time in North Central NJ. Do not apply to trees that are drought or heat stressed. In speaking with Dr. Greg Clark, Valent Bioscience, if you must apply Retain now on certain cultivars, do not apply when the fruit is hot as on these 90 degree days. Apply very early in the morning, e.g. 5am when the fruit has cooled all night. In the evening the fruit still retains the field heat. Remember Retain needs 8 hours of dry time to be rainfast; watch out for expected thundershowers. □

Food Safety Series Water Testing and Third-Party Audits

Wesley Kline, Ph.D., Cumberland County Agricultural Agent

Q – What water sources need to be tested?

A – All water sources used in production, spraying or post harvest operations must be tested. This includes municipal, well and surface water.

Q - How often do I test?

A - Municipal water test results can be obtained from the local water authority on an annual basis. Well water should be tested twice each year and treated if fecal coliforms are present. Surface water should be tested three times during the growing season – first at planting, second at peak use, and third near harvest.

Q – What do I test for?

A – Test for fecal coliform not total coliform. The results should be reported in numbers not just presence or absence. Testing for E. coli is also recommended.

Q – What if the test comes back positive for fecal coliform or E. coli?

A – Well water can be shock treated for the bacteria prior to use. Information is available through your county extension office or contact the health department. Surface water is harder to treat.

Q – What levels are acceptable?

A. – For potable water, it is the same as drinking water standards. For irrigation water the acceptable levels are still being discussed. For this year, New Jersey will use 200 Fecal Coliform units/100 ml. There will be continued research in this area to refine the levels.

Q – What do I do with the results?

A – When you request an audit, the auditor will request to see the results to verify that water testing is a standard practice. These test results should be kept to compare one sampling date to the next.

Q – Do I need to use potable water for all applications?

A – No, potable water must be used for drinking, hand washing, cooling produce and ice making. Surface water is not considered potable so it cannot be used for post harvest activities.

Q - Do all crops need to be audited?

A – No, for a vegetable farm that grows spring, summer and fall crops the grower and the buyer can decide which crops they would like audited. Only the crops audited will be listed on the USDA website. USDA auditors will work with the operation to group crops together.

SEE WATER TESTING ON PAGE 5

Fruit IPM

Dean Polk, Fruit IPM Agent and David Schmitt, Eugene Rizio, and Atanas Atanassov, Ph.D., Program Associates, Tree Fruit IPM

Peach

✓ **Oriental Fruit Moth (OFM):** All treatment windows for OFM have now closed in southern and central counties. Growers should be applying the second spray in northern counties. Of course all of this should be tempered with actual population pressure. Growers who have very low moth counts can get by with no sprays. Any captures above an average of 6 moths/trap indicates the need for insecticide. Late treatments for OFM (third brood stragglers and 4th brood) should be based on trap counts and any presence of flagging. Degree day spray timings are as follows, updated since last week:

✓ **Anthracnose; Fruit Rots:** This is usually the time when anthracnose symptoms appear on susceptible varieties in the final stages of ripening. These infections would have occurred several weeks ago and nothing can be done at this point to prevent further infections in ripening blocks. Rhizopus and Brown Rots also have been seen in some blocks in very low numbers. Elite is the fungicide of choice where both rhizopus and brown rot are concerns.

OFM Treatment Timings – 3rd Brood, 2 Sprays/Generation		
County Area	Application and Insecticide Type	
	Standard Insecticides	Intrepid
Southern	1 st past, 2 nd trt past	1 st trt past, 2 nd past
Central	1 st past, 2 nd trt past	1 st trt past, 2 nd past
Northern	1 st past, 2 nd trt 8/8-10	1 st trt past, 2 nd trt 8/6-8

✓ **Tufted Apple Budmoth (TABM):** Pressure as indicated by trap counts has raised slightly but overall remains low in all regions. Most growers in northern counties should not need to target TABM, unless they have a prior history of TABM damage in either apples or peaches. Timings are updated in the following table:

TABM Treatment Timings – 2 nd Generation				
County Area	Spray Type			
	AM	EM	Intrepid - EM	Bt-EM
Southern	2 nd 8/5-7, 3 rd 8/10-12	1 st past, 2 nd 8/13-16	1 st 8/4-7, 2 nd 8/13-16	1 st 8/4-7, 2 nd 8/13-16
Central	2 nd 8/7-8, 3 rd 8/13-14	1 st past, 2 nd 8/15-19	1 st 8/6-9, 2 nd 8/15-19	1 st 8/6-9, 2 nd 8/15-19
Northern	1 st 8/7-8, 2 nd 8/13-14	1 st 8/10-12	1 st 8/10-12	1 st 8/10-12

✓ **Catfacing Insects:** Fresh injury was observed in weedy blocks in northern counties. Intrepid or Spintor will not control catfacing insects so an effective plant bug material should be included. There may still be time on late maturing varieties for O.P.s or Pyrethroids. In blocks less than 2-3 two weeks to harvest, Lannate will provide some control.

Apple

✓ **Tufted Apple Budmoth (TABM):** See peach section above.

✓ **European Red Mite:** Mites have been problematic in a number of orchards. While in most cases, the newer materials have worked well, growers should be aware that Envidor may take several days to reduce mite populations. Do not use any one miticide or the same class of miticide more than once during the season.

✓ **Summer Diseases:** Sooty blotch has been observed at very low levels in both southern and northern regions. With infections now beginning to appear summer disease pressure will begin to increase. Regular applications should be applied throughout mid to late summer with a Captan/Topsin mix or other material such as Sovran, Flint, Pristine, or Ziram. Be sure to maintain coverage and renew with effective materials after 1.5-2" rain, depending on the material used. Summer pruning and keeping the groundcover mowed will also help to prevent new infections by allowing the canopy to dry out quickly, and provide good air drainage.

Editor's Note: Note: There is no Blueberry information this week.

SEE PAGE 5 FOR TRAP COUNTS

Trap Counts Tree Fruit Southern Counties

Week End	STLM	TABM-A	CM	OFM-A	DWB	OFM-P	TABM-P	LPTB	PTB
7/7	126	2	1	3	58	1	2	68	1
7/14	70	0	1	4	9	1	1	75	2
7/21	415	1	2	1	6	2	2	54	1
7/28	502	3	4	3	13	1	4	32	3
8/4	790	2	2	6	28	1	4	10	3

Tree Fruit Northern Counties

Week End	STLM	TABM-A	CM	DWB	OFM-P	TABM-P	LPTB	PTB	OBLR
7/7	453.1	3.6	0.8	0.0	10.1	4.3	18.0	2.0	
7/14	635.7	0.9	0.2	1.2	6.9	1.0	21.8	1.9	0.0
7/21	513	0.5	0.9	0.0	6.5	0.8	13.8	1.4	0.5
7/28	849.3	1.1	1.3	0.0	3.1	1.1	8.1	0.7	0.3
8/4	645.7	0.3	0.8	0.0	4.4	0.4	6.3	0.9	0.5

Note: There is no new Blueberry information this week.

Blueberry

Atlantic County

Week End	CBFW	RBLR	OBLR	SNLH	OR BEET	BBM
7/7	0.02	13.59	1.94	0.59	569.80	0.31
7/14	0.07	5.70	0.63	0.40	613.88	0.36
7/21	0.09	1.45	1.88	0.13	329.44	0.31
7/28	0.00	1.64	3.7	0.19	62.11	0.31

Burlington County

Week End	CBFW	RBLR	OBLR	SNLH	OR BEET	BBM
7/7	0.31	3.04	1.79	0.76	605.00	0.24
7/14	0.00	0.75	1.21	0.68	628.50	0.36
7/21	0.00	0.00	1.93	0.41	128.89	0.79
7/28	0.00	0.00	1.00	0.78	55.00	0.73

WATER TESTING FROM PAGE 3

For example, if greens are grown in the spring and fall the spring audit can also apply for the fall crops. However, if summer crops are grown (i.e. tomatoes, peppers, eggplant, etc.) and the operation/buyer would like those audited, then two audits would be required. With the second audit, generally it only would be the packing and field operations related to those crops. The general question section would not be revisited unless the auditors see a health and safety issue. This also will help reduce the cost of the second audit.

Q – Why are we being asked to have more than one audit by buyers?

A – It depends on who is purchasing the produce. Most buyers will accept the USDA audit, but there are exceptions. If two different buyers ask a grower to use different auditing firms talk to the buyers to see which auditing firm would be acceptable to both.

Q – Do packing sheds need to be enclosed?

A – No, but there must be some way to exclude birds and rodents from the open shed. This can be done by covering the eaves with mesh screens, using distress signals, bird guards, etc. Remember the presence

of birds or rodents or signs of either can result in an automatic failure of the audit. If a new packing shed is being built, I would recommend it be enclosed. There is no question that enclosed packing sheds are much better than open sheds. If the packing shed is enclosed, make sure the doors are closed at night. This will help reduce the bird problem.

Q – Do all water sources need to be tested?

A – Yes, the wells that are used for drinking and the packing shed must be potable water. This means the normal test for house wells (drinking water standards) will be carried out. That includes testing for total Coliform.

For irrigation sources, the water does not need to be potable. Those sources must be tested for at least fecal coliform and preferably E. coli. **A total coliform count will not tell the grower whether it is fecal or not.** If surface water is tested, there will be coliform present. Do not waste time and money testing for total coliform and then have to re-test for fecal coliform. □

RUTGERS

New Jersey Agricultural
Experiment Station

Plant & Pest Advisory
Rutgers School of Environmental
and Biological Sciences
ASB II, 57 US Hwy. 1
New Brunswick, N.J. 08901

FIRST CLASS
POSTAGE PAID
PERMIT #576
MILLTOWN, NJ 08850

PLANT & PEST ADVISORY FRUIT EDITION - CONTRIBUTORS

Rutgers Cooperative Extension (RCE) Specialists and Program Associate

George Hamilton, Ph.D., Pest Management
Norman Lalancette, Ph.D., Plant Pathology
Bradley A. Majek, Ph.D., Weed Science
Peter Oudemans, Ph.D., Small Fruit Plant Pathology
Cesar Rodriguez-Saona, Ph.D., Cranberry/Blueberry Entomology
Peter W. Shearer, Ph.D., Entomology
Daniel Ward, Ph.D., Pomology
Gail Lokaj, Program Associate in Pomology

Rutgers NJAES

Joseph Goffreda, Ph.D., Breeding

RCE Agricultural Agents and Program Associates

Atlantic County, Gary C. Pavlis, Ph.D. (609-625-0056)
Gloucester County, Jerome L. Frecon (856-307-6450)
Hunterdon County, Winfred P. Cowgill, Jr. (908-788-1338)
Morris County, Peter J. Nitzsche (973-285-8300)
Passaic, Elaine F. Barbour, Agric. Assistant (973-305-5740)
Warren County, William H. Tietjen (908-475-6505)
Fruit IPM, Dean Polk (609-758-7311)
Atanas Atanassov, Ph.D., Program Associate (908-788-1338)
Gene Rizio, Program Associate (856-566-2900)
David Schmitt, Program Associate (856-307-6450)

Newsletter Production

Jack Rabin, Associate Director for Farm Services, NJAES
Cindy Rovins, Agricultural Communications Editor

Pesticide User Responsibility: Use pesticides safely and follow instructions on labels. The pesticide user is responsible for proper use, storage and disposal, residues on crops, and damage caused by drift. For specific labels, special local-needs label 24(c) registration, or section 18 exemption, contact RCE in your County.

Use of Trade Names: No discrimination or endorsement is intended in the use of trade names in this publication. In some instances a compound may be sold under different trade names and may vary as to label clearances.

Reproduction of Articles: RCE invites reproduction of individual articles, source cited with complete article name, author name, followed by Rutgers Cooperative Extension, Plant & Pest Advisory Newsletter.

For back issues, visit our web site at:
www.rce.rutgers.edu/pubs/plantandpestadvisory