PSU Battles Gray Mold

UNIVERSITY PARK (Centre Co.) — Gray mold is the major factor keeping inexpensive, long lasting black and red raspberries out of supermarket produce areas, according to a Penn State researcher.

"Raspberries are extremely perishable," said Dr. Barbara L. Goulart, assistant professor of horticulture.

"They have loosely connected drupelets, a very high rate of post harvest respiration and when picked, removal of the green receptacle leaves a cavity that is perfect for mold growth and makes the berries very crushable."

"Raspberry production for fresh market consumption is severely limited by the rapid deterioration of the fruit," Goulart told attendees at the annual meeting of the American Society of Horticulture Science, on Penn State's campus in University Park.

"The most common cause of post harvest decline is gray mold fruit rot, caused by Botrytis cinerea. Even if the mold is controlled, after a week the fruit discolors and is unsalable," Goulart said.

"There are commercial fungicides available to deal with gray mold, but we are losing fungicides continuously either because manufacturers find it unprofitable to keep the fruit listed on the labels or the fungus becomes resistant to the chemicals."

The U.S. Environmental Protection Agency, which regulates fungicides for use on consumable crops, requires that manufacturers list on their labels the crops for which the chemicals have been approved. If a fruit or vegetable is not listed, the chemical cannot be used on a commercial crop.

Goulart and a team of researchers have been working on a potential fungicide, Pyrrolnitrin, which is derived from a bacteria and is currently used in Japan to treat human fungal infections of the skin.

"We are interested because it is probably a relatively safe chemical," said Goulart. "Initial tests, dipping strawberries after harvest, also showed excellent fungal control."

The researchers — who include Goulart; Philip Hammer, graduate student in horticulture; and Dr. Kathleen Evensen, associate professor of post harvest physiology, from Penn State; and Wojciech Janisiewicz and Fumiomi Takeda, Appalachian Fruit Research Station, U.S. Department of Agriculture, Kearneysville, W.V. — tested both red and black raspberries in field tests using pyrrolnitrin.

Berries were treated in the field with either commercially available fungicides, sterile water or pyrrolnitrin; picked one, four or six days after treatment, and stored at 32 or 64 degrees Fahrenheit.

Some of the berries were also stored in a high carbon dioxide environment to determine if carbon dioxide could prevent the growth of gray mold.

"Unfortunately, the effects for the pyrrolnitrin have been intermediate between no treatment at all and the standard commercial fungicides," said Goulart.

The Penn State researcher said he believes that the poor results are due to methodological problems rather than an inherent problem with Pyrrolnitrin as a fungicide.

"Commercial fungicides have a surfactant — a chemical that makes the liquid spread and stick — combined in their formulation," said Goulart. "We did mix an off-the-shelf surfactant with the pyrrolnitrin, but it's not the same as something that is designed for a particular chemical.

"We would like to find a chemical company to formulate a pyrrolnitrin fungicide for us, but in these tight money times we are not sure anyone will be willing to take the risk."

Until a formulation exists, the researchers have suspended their field studies.

Experimentation with carbon dioxide had mixed results, according to the researchers. While the high carbon dioxide environment did prevent gray mold from forming, the berries degraded unacceptabley after eight days.

"Even if we extend shfl like using high carbon dioxide and fungicides, after a week the berries discolor and look very unattractive," Goulart said. "The red berries turn dark red and the black berries get dull and turn light pink around the drupelets."

Blair Co. DHIA dhia Monthly Report

Pennsylvania Dairy Herd Improvement Association

BREED CODES:

1 Ayrshire
2 Guernsey
3 Holstein
4 Jersey
5 Brown Swiss
8 More Than One Breed
G Grade
B Grade and Registered

May 1991
Rolling Herd Averages

Owner	No. Cows	% Cow Days In Milk	Milk Lbs.	Fat Lbs.	Protein Lbs.
Thomas W. Kelly	81.1	88.1	23,542	846	730
Mike + Carol Hoover	104.9	89.5	22,765	838	729
Dennis A. Smith	76.4	86.6	23,798	893	727
Clover Will Farms	135.5	88.8	22,632	880	708
Over Lane Farms	104.2	89.1	22,008	845	694
Smith Hollow Farms	121.1	88.3	22,065	819	686
Hilecrest Farm	246.5	88.6	21,291	803	686
Steven E. Pheasant	49.9	97.1	21,078	815	684
Marcove Farm	76.9	88.0	21,781	799	679
Martin Stayduhar	53.3	87.5	22,123	784	678
Sparkling Springs Farm	261.8	88.1	21,686	822	676
PA Fair Valley Farm	79.6	88.7	20,783	780	671
William-Susan Baker	100.8	88.4	21,281	822	667
Emile Dilling	122.4	87.7	21,546	825	666
Lar Ann Farm	154.1	87.2	21,056	811	665
Kenneth + Debra Bush	49.3	85.9	20,913	750	664
Fred + Gary Bechtel	95.0	87.9	20,548	739	661
David Nancy Bishop	53.4	89.2	21,591	831	657
Frederick Farms	101.6	85.3	20,607	728	655
Gor Da Farm	83.4	90.1	20,491	732	655

Lactation Report

Over Lane Farms						
396	GH	4/3	22,745		4.1	943
Smith Hollow Farms						
564	RH	2/6	25,702	753	3.6	949
Clover Will Farms						
153	RH	3/6	27,702	828	3.4	961
Pleasant View Farm 3						
529	GH	3/2	18,190		4.8	877
Mil-Ber Farms						
Jackie	RH	5/5	25,592	766	3.7	952
Marcove Farm						
Janet	RH	6/3	25,275	782		
Isabel	RH	3/7	20,984		4.0	852
Jani	RH	3/4	24,443	760	3.9	974
Emile Dilling						
498	RH	4/6	21,864		4.1	911
510	RH	4/3	25,164	779	4.0	1022
Dennis A. Smith						
110	RH	3/9	24,010		3.9	951
145	RH	2/9	28,220	806	3.3	950
184	RH	1/11	20,478		4.7	969
Fred + Gary Bechtel						
Reba	GH	3/3	21,661		3.9	859
William-Susan Baker						
728	GH	3/3	23,890		3.9	948
762	GH	3/0	21,548		4.0	875
873	GH	2/0	23,309		4.1	956
Blackcrest Farms						
Nanette	RH	6/7	27,645	815	3.6	998
Gor Da Farm						
42	GH	5/2	27,258	869	3.4	928
Bradley + James Baker						
719	GH	3/0	21,527		4.0	863
Pleasant View Farms 1						
335	RH	3/6	23,050	752		
Lar Ann Farm						
Cupid	RH	6/0	23,529		3.7	885
Thomas W. Kelly						
Charm	RH	7/0	22,912	756	4.1	955
Misleto	RH	6/6	28,621	897	3.9	1131
Willa	RH	3/4	23,512		3.6	853
No-El Farm						
Pepsi	GH	3/10	27,800	817	3.5	981
Bernie	GH	3/2	23,566	751	3.7	887
Rock City Farm						
Space	RH	3/11	22,084		4.3	952
Cross Country Farms						
256	GH	3/6	25,218	834	3.8	978
Mike + Carol Hoover						
185	GH	6/5	26,482	802	3.5	939
Wanda	RH	6/6	25,236	770	3.7	936
Sparkling Springs Farm						
386	GH	7/1	26,001	827	3.5	910
427	GH	6/7	27,675	792	3.4	947
592	GH	4/10	28,391	816	3.4	989
535	GH	5/6	25,628	771	3.8	982
529	GH	5/6	22,286		3.8	850
693	GH	3/6	28,156	918	3.8	1087
704	GH	3/7	21,667		3.9	863
631	GH	3/4	21,928		4.0	884
726	GH	3/3	21,355		4.0	858
862	GH	2/1	28,431	798		
861	GH	2/2	23,110		3.7	864
Penn-England						
Pepe	GH	3/3	22,431		4.4	989
Miriam	RH	2/7	23,502	800	4.2	992
PA Fair Valley Farm						
303	GH	3/2	21,886		3.9	872
Fidelity Holsteins						
Princes	RH	5/0	24,771	788		
Rodrick & Trudy Hinish						
62	GH	5/3	22,757		4 0	920
159	GH	4/3	25,711	764	3 4	876
101	GH	4/0	23,275		3 7	865
Jerry+ Joan Bechtel						
11	RH	6/0	24,954	781	4 1	1036
John T. Hileman Jr.						
44	GH	4/1	26,231	768		
486	GH	3/8	25,511	797		
D.E. Hileman Farms						
110	GH	5/1	20,682		4.3	903
Frederick Farms						
17	GH	5/7	36,379	1111	3.8	1414
36	RH	7/0	22,878		4.3	989
Hilecrest Farm						
228	RH	5/9	26,368	817	4.0	1073
312	RH	3/8	26,824	826	3 6	991
142	RH	2/10	24,683	777		
Durrell + Dawn Delp						
Juniper	RH	6/5	23,054	777	3 6	851
Steven E. Pheasant						
190	RH	3/10	22,914		3.8	882
James + Debra Byler						
493	RH	3/2	21,440		4.2	914