

PLANT & PEST ADVISORY

CRANBERRY EDITION \$1.50

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Yields and Hot Weather

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Growers throughout Wisconsin have been wondering how this hot weather in June and July will affect yields in October. Since weather patterns are unique from year to year, it is impossible to look at individual cases and draw broad conclusions. However, a little research has been done relating weather and yield. A study in New Jersey examined the relationship between weather and yields for the period of 1906 to 1984 and two subsets within that time. These researchers found that temperature and sunshine are two important variables. In general, warm temperatures from mid-May to late June, mid-October to mid-November and cold temperatures in early-February through March corresponded to good yields. Sunny weather in early May through mid-June also corresponded to high yields. On the other hand, hot temperatures (above 90°F) during the immediate pre-bloom period (400 to 530 GDD) or during July corresponded to lower yields.

In a two year study of hybrid cranberry cultivars in the five cranberry growing states, we found that the rate of growth of cranberry fruit was best predicted by the number of moderate temperature days, between 60 and 85°F. This accounted for more than 80% of the variation in rate of fruit growth across states. One cool year in Wisconsin slowed fruit growth by 11 days compared to a more average year the year following. Including sunlight intensity improved the prediction above 90% accuracy.

A recent study of berry scald in New Jersey found that a severe scald event in 1990 included clear skies, air temperatures above 80°F, canopy temperatures up to 106°F, soil temperatures at 1 inch at about 80°F, dry soils from lack of rainfall AND dry air (dewpoints <54°F). However, growers who sprinkle irrigated during the heat of the day reported much lower incidence of scald (<0.5%) than on unirrigated beds (»25%). The rule of thumb used by New Jersey growers is to begin irrigation when air temperatures reach 84°F. Irrigation replaces lost soil moisture and serves to cool the vines from the cooler water temperatures and from evaporative cooling.

Extreme heat is stressful to cranberry vines. Since cranberries have a rudimentary root system, replacing water lost to the air is critical.

SEE HOT WEATHER ON PAGE 2

HOT WEATHER FROM PAGE 1

Cranberries don't have good control of the openings in the leaves that allow water to evaporate, so when the plant is having a hard time keeping up with the demand for water they can't simply "close the holes". The optimal temperature for photosynthesis in cranberries is about 75°F and the rate of photosynthesis declines as temperatures are warmer or cooler than this.

One common symptom seen during hot weather is vine yellowing. The leaves may turn yellowish between the leaf veins. This usually appears in patches. These symptoms are rarely seen during cool years. I don't know of a remedy for vine yellowing except more moderate weather. Experience suggests that yellow leaves are less productive than green ones, thus fruit number or size may be reduced.

What can growers do to alleviate the detrimental effects of extremely hot weather? Four suggestions follow:

1. Make sure soil moisture is adequate and continuous. Irrigate in the mornings to saturate the root zone. Morning or evening irrigation minimizes evaporation.

2. Check soil temperatures. Unvined areas on sand may be very hot and will lose soil moisture quickly.

3. Irrigate during the heat of the day. Vine and soil temperatures will be reduced from the cooler water temperatures as well as from evaporation (although with dew points near 70 evaporation is very slow). Cycle irrigation on for 20 to 30 minutes to conserve water. Water droplets remaining on vines **DO NOT** act like little magnifying glasses leading to scald spots on vines. This has no basis in fact!

4. Consider draining mainlines if you plan to irrigate during the heat of the day. Water sitting in aluminum pipe heats up quickly and will scald vines when it is pumped through the sprinklers.

Careful thought and good management practices will allow you to beat the heat and still produce good yields. □

Editor's Note: This is the last issue of the Cranberry edition of the Plant & Pest Advisory for the 2005 season. Thank you for subscribing.

Weekly Weather Summary

Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged above normal, averaging 76 degrees north, 78 degrees central and 78 degrees south. Extremes were 99 degrees at Canoe Brook and Pomona on the 28th, and 57 degrees at Newton on the 30th. Weekly rainfall averaged 0.32 inches north, 0.25 inches central, and 0.95 inches south. The heaviest 24 hour total reported was 1.59 inches at Cape May Courthouse on the 30th to 31st. Estimated soil moisture, in percent of field capacity, this past week averaged 64 percent north, 50 percent central and 47 percent south. Four inch soil temperatures averaged 75 degrees north, 77 degrees central and 78 degrees south.

Weather Summary for the Week Ending 8 am Monday 8/ 1/ 5											
WEATHER STATIONS	R A I N F A L L			TEMPERATURE				GDD BASE50		MON %FC	
	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP		
BELVIDERE BRIDGE	missing										
CANOE BROOK	.23	17.94	-2.87	99	62	78.	4	1967	396	59	
CHARLOTTEBURG	.31	20.30	-.67	92	59	75.	3	1617	405	54	
FLEMINGTON	.25	22.72	2.56	96	61	77.	3	1854	237	57	
NEWTON	.49	17.29	-1.95	91	57	74.	1	1743	317	64	
FREEHOLD	.11	22.46	2.92	97	62	77.	2	1859	125	52	
LONG BRANCH	.40	21.56	2.14	92	64	76.	1	1824	168	44	
NEW BRUNSWICK	.14	22.50	2.98	97	62	78.	3	1943	121	64	
TOMS RIVER	.58	22.63	2.57	97	64	78.	3	1798	136	39	
TRENTON	.00	20.62	1.93	98	62	80.	3	1976	79	22	
CAPE MAY COURT HOUSE	2.26	20.70	3.43	95	66	77.	1	1615	-155	93	
DOWNSTOWN	.53	17.21	-1.04	96	64	78.	1	1864	-45	44	
GLASSBORO	.00	18.05	-1.18	98	65	79.	3	2100	217	26	
HAMMONTON	.54	19.35	.05	97	62	76.	0	1923	41	37	
POMONA	1.76	19.50	2.11	99	64	77.	2	1831	76	87	
SEABROOK	.61	18.55	.89	98	67	79.	2	2126	210	45	
SOUTH HARRISON	.60	22.77	3.32	95	66	78	NA	1992	NA	NA	

*SOME CUMULATIVE VALUES ESTIMATED DUE TO MISSING PAST DATA
WES KLINE — GDD BASE 40 PINEY HOLLOW Last Week* 277 (Ending 7/25/05) This Week 265 (Ending 8/1/05)
* February total base 40 equals 32 units

Field Update

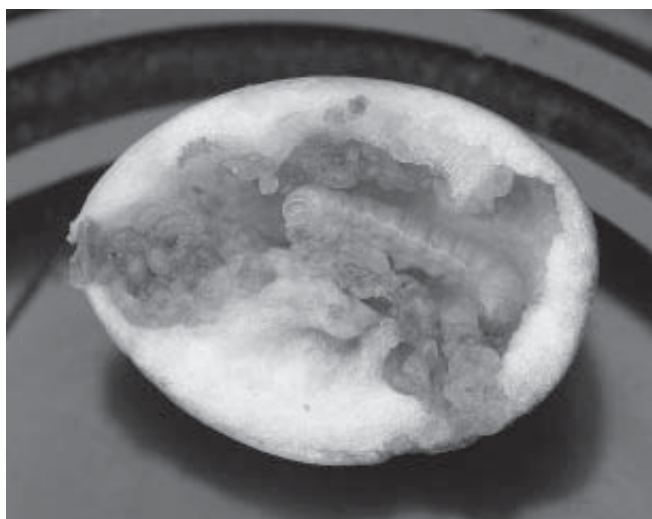
Dan Schiffhauer, Agricultural Specialist, Ocean Spray Cranberries

Bloom is well behind us and fruit size looks very good. Fruit size was below average last year and my guess is this was due to the cooler than average temperatures. New Jersey has the largest average fruit size and the hottest summer temperatures of any growing region. Anyone who has been outside during the last month or so knows that heat is not a problem this year.

Fruit feeding insect damage usually begins to show up about now and to date I have found very few *Sparganothis* larvae in fruit. This fits with the very low pheromone trap catch, but it is still too early to claim victory. The insect that is by far the most commonly found in fruit this year is the **cranberry fruitworm**. This is very unusual for New Jersey. Cranberry fruitworm is the major fruit pest in Massachusetts, and is a problem in Wisconsin as well. I normally find cranberry fruitworm damage only on beds that are very early. Blueberry research colleagues tell me that this insect is important on New Jersey blueberries. I don't think that the exact reason for cranberry fruitworm scarcity as a pest on New Jersey cranberry beds has ever been demonstrated, but I am convinced that it is a case of non-overlapping phenology. Cranberry fruitworm has one generation per year and they overwinter as pupae. The adult moths emerge in the spring and females go searching for fruit. Females lay single eggs on the calyx end of cranberries (or blueberries) and the resulting larvae enter the fruit and begin feeding. Individual larvae will feed on multiple fruit in the course of development. The key to this picture is the presence of suitable sized fruit at the time that the female moths are flying around laying eggs. It seems that most years the moths are looking for fruit before many cranberries have developed; the cranberries are out of synch with the cranberry fruitworm females. This year things apparently were a bit different. The abnormally cold weather in May probably retarded the development of cranberry fruitworm. Cranberries were also behind by the end of May, but with the hot weather in June they quickly caught up and by the end of bloom most cranberry beds were back on track. I suspect that the cranberry fruitworm emergence did not catch up as much, and thus the moth flight occurred when there were cranberries of sufficient size for egg laying. I expect this to be a one-time phenomenon. New Jersey growers certainly do not need or want this insect as a regular pest. It is very difficult to control and scouting requires sampling fruit and examining the calyx end under a stereomicroscope for eggs. Very, very labor intensive.



Cranberry damaged by fruitworm feeding. Note entrance hole near stem.



Cranberry fruitworm larva inside fruit. Fruitworm larvae typically leave frass inside fruit.

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