

May 4, 2000

## Strawberry Information

### Strawberry Evaporative Cooling (from Gina Fernandez)

#### EVAPORATIVE COOLING Q&A, JUST IN CASE.....

What happens to the plant/fruit when it gets too hot?

Hot dry weather during flowering and fruiting can reduce fruit set, fruit size and quality. In May of 1996, just as many fields in North Carolina were coming into peak production, temperatures soared into the 90's and fruit turned white, a condition called sunscald. This whitening occurred on the side of fruit exposed to the sun. We observed berries with sunscald on strawberry plantings that were in both black and white plastic mulch.

What is evaporative cooling?

Evaporative cooling can help to overcome these problems. Evaporative cooling involves the use of water to absorb heat. When heat is absorbed, water evaporates. This results in the cooling of the plant surface, and the temperature of the plant (including fruit) is lowered.

What weather conditions can result in damage?

Daytime temperatures, relative humidity and wind speed need to be considered. We suggest that you consider using evaporative cooling when the temperatures exceed 85o F, there is low humidity, and wind speeds are over ten miles per hour. As temperatures increase over 90o F., seriously consider using evaporative cooling regardless of humidity and wind speed. In addition, very low humidity and higher winds at 80o F. may require evaporative cooling. These are just suggestions and just like frost protection there are no concrete rules on when to turn water on and off. Your objective should be to reduce the rate of evapotranspiration and the temperature of the plants and fruit to a level that will allow for normal growth and development. Evaporative cooling can lower bud and fruit temperature as much as 15o F.

How should I monitor flower and fruit temperatures?

Here is your opportunity to use that digital thermometer again. Insert the sensors in a blossom and/or fruit on days that temperatures are expected to exceed 85°F. Continue to monitor the temperature throughout the day. If temperatures exceed 85°F and the plants are dry, start the water. Run for one hour or less and never past 4:00 p.m. The plants must dry out before sunset or they will not dry until the next day. Short, frequent running times, are better than one or two long running times. The short running times during hot and dry periods will generally provide more effective cooling. If the plant is wet, evaporation is occurring. Once the plant is wet (15 minutes or less), no more water is needed until it dries off again.

What rate of water application is best?

Smaller size nozzles are best. Application rates of 1/10th inch/hour should be adequate.

Will I increase the likelihood of disease?

Yes! The application of water at this time can also increase disease problems. The diseases can result in as many unmarketable fruit as hot, dry weather. Proper water application procedures can maintain berry size and quality without disease problems. It is important to let the plants dry out as early each day as possible and never allow them to be wet going into the night. Also, as always, it is important to have an effective fungicide program to help control diseases, but more so if you are using evaporative cooling.

Gina Fernandez, PhD  
Assistant Professor/Fruit Specialist  
North Carolina State University  
Vernon G. James Research and Extension Center  
207 Research Station Rd.  
Plymouth, NC 27962

Tel: 252-793-4428 ext. 167

Fax: 252-793-5142

Email:Gina\_Fernandez@ncsu.edu

p.s. At the research station at Clayton we are planning on doing evaporative cooling today (Thur) and probably right through the weekend. Forecast showing real potential problems with higher temperatures! We are concerned more for the smaller plants (which many growers have this year) that do not have enough leaf canopy shading fruit. We will try to post photos of this problem on the web on Friday. It is likely that we'll start sometime after noon each day and sprinkle lightly for an hour or more. We need to do some work on this technique and I believe Dr. Miner (who will run the system for us at Clayton this weekend) will do some experimenting with how long to run. Get those digital thermometers back out as Gina suggests, and monitor pulp temps to see how you are doing.

Barclay Poling

Weather Data for Clayton (courtesy of SkyBit)

#### E-WEATHER FORECAST AND SUMMARY

For: NC-JOHNSTON-CENTRAL CROPS RES STN Date: THU MAY 4, 2000

#### <----- 0-48 HOUR FORECAST----->

DATE May 4 May 5

HOUR (EDT) 8a 11a 2p 5p 8p 11p 2a 5a 8a 11a 2p 5p 8p 11p

TEMP (F) 58 71 79 82 75 66 62 60 62 75 82 83 76 69

2"- SOIL TEMP (F) 64 70 76 79 77 72 66 63 64 70 77 80 78 73

REL HUM (%) 83 55 39 35 50 69 80 88 87 57 43 42 56 72

6HR PRECIP(in) .00/ .00/ .00/ .00/ .00/ .00/ .00/

6HR PRECIP PROB(%) 1/ 3/ 3/ 0/ 4/ 4/ 1/

3HR EVAP (in) .00 .07 .12 .10 .03 .01 .00 .00 .00 .07 .12 .10 .03 .01

3HR WETNESS (hrs) 0 0 0 0 0 0 0 0 0 0 0 0 0 0

WIND DIR (pt) SE SSE SSE SSE SSE SSE SSE SSW SSW WSW W SSW SSE SSE

WIND SPEED (mph) 3 6 6 6 3 4 3 3 3 4 5 4 2 2

CLOUD COVER CLR CLR SCT SCT CLR CLR CLR SCT CLR CLR SCT SCT SCT CLR

3HR RADIATION (ly) 18 151 230 197 69 0 0 0 18 150 229 196 69 0

PCT RADIATION (%) 100 100 95 94 94 0 --- --- 99 100 95 94 94 0

DRYING (key) 2 7 8 9 7 5 4 2 3 6 8 8 6 5

SPRAYING (key) 8 7 7 8 10 8 8 8 8 8 8 8 9 9 9

#### <----- 1-7 DAY FORECAST -----> <8-10 DAY OUTLOOK>

DATE May 4 5 6 7 8 9 10 11 12 13

DAY THU FRI SAT SUN MON TUE WED THU FRI SAT

-----  
MAX AIR TEMP (F) 83 85 89 89 86 82 79 85 82 79  
MIN AIR TEMP (F) 58 58 60 63 64 62 59 58 56 55  
PRECIP PROB (%) 6 6 15 18 28 35 38 31 31 32  
AVG DAILY RH (%) 62 65 65 66 69 70 70 62 64 65  
AVG WND SPD (mph) 4 4 4 6 7 7 7 8 7 7  
DRYING (key) 6 5 5 6 5 5 5 6 6 6  
SPRAYING (key) 8 8 9 7 6 6 6 6 6 6  
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<----- 1-7 DAY SUMMARY ----->

DATE Apr 27 Apr 28 Apr 29 Apr 30 May 1 May 2 May 3  
DAY THU FRI SAT SUN MON TUE WED  
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MAX AIR TEMP (F) 64 57 67 77 80 77 79  
MIN AIR TEMP (F) 48 50 46 47 48 57 57  
MAX 2" SOIL TMP (F) 64 57 66 76 79 77 78  
MIN 2" SOIL TMP (F) 49 51 50 51 56 60 57  
AVG DAILY RH (%) 79 97 77 62 56 73 63  
PRECIP (in) 0.22 0.70 0.26 0.00 0.00 0.00 0.00  
EVAP (in) 0.14 0.10 0.17 0.21 0.24 0.20 0.23  
WETNESS (hrs) 13 20 19 9 0 2 9  
WIND SPEED (mph) 5 6 4 4 9 7 6  
RADIATION (ly) 389 213 567 674 639 524 686  
PCT RADIATION (%) 57 31 82 97 92 76 98  
DRYING (key) 4 2 4 6 7 5 6  
SPRAYING (key) 8 6 8 8 5 6 7  
=====

key: 0..1..2..3..4..5..6..7..8..9..10  
LESS FAVORABLE MORE FAVORABLE

Note: Key for drying and spraying assumes no precipitation.  
Local precipitation may result in unfavorable conditions.

Delivery Problems: 1-877-273-7363 (1-877-2-RE-SEND)  
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Contributed by:  
E. Barclay Poling, Director  
SRSFC  
Campus Box 7533, 1017 Main Campus Dr., Suite 1100  
Raleigh, North Carolina 27695-7553  
919.515.5365

The Southern Region Small Fruit Consortium

Campus Box 7533  
1017 Main Campus Drive / Suite 1100  
NCSU Centennial Campus  
Raleigh, North Carolina 27695-7553

919.515.5365