Anthocyanin Development

Since fruit color is so important to the cranberry industry, I thought I would take a little space and describe a little about fruit color development in cranberry. The red color of mature cranberries is caused by the development of anthocyanin pigments in the few outermost cell layers. This is also associated with a dilution of chlorophyll as the berries enlarge. Anthocyanins are fairly complex molecules which require significant amounts of energy to create. Anthocyanin production is broadly regulated at two levels: environment and genetics.

Development of fruit color is usually associated with bright sunny days and cool nights. Research has clearly shown that the greatest amount of color develops with the coolest weather and that in the immediate pre-harvest period warm temperatures lead to poor fruit color. The most intense color is also formed where sunlight strikes the fruit directly. Growers have long noted that fruit in the top of the canopy is better colored than fruit deep in the canopy and that the tops of the fruit tend to have better color than the bottoms. The effect of light on fruit color development has been studied extensively for apples (which also must have light directly striking fruit for optimal color development). In apples, light intensity of less than 30% of full sun is ineffective in developing fruit color. Apparently light is critical for two reasons. First, to induce formation of color; and second to provide carbohydrates that are subsequently formed into anthocyanins. Unfortunately, we can do little about the environment on cranberry marshes. We are at the mercy of the weather.

Different cultivars develop more anthocyanin than others do and some develop color earlier. These are genetic differences which can be exploited in breeding programs. There seems to be a negative relationship between fruit size and fruit color, with larger berries having less anthocyanin per volume than small berries. There are also qualitative differences with cultivars such as Budd's Blues producing more blue and less red pigment than other cultivars. Most of the newer hybrid cultivars produce better color than older selections from the wild.

In many fruit crops, including cranberry, there is a negative relationship between nitrogen fertilization and fruit color. The exact mechanism is not known, but the speculation is that too much nitrogen forces vegetative growth which takes resources that may otherwise have gone to color production. Alternatively, substantial vegetative growth may provide additional shade that prevents color development.

In the past several pesticides were used to enhance color development in cranberry. To my knowledge these practices have been abandoned. Good overall management accompanied by cooperative weather is what is needed for good color development today.

Teryl Roper, UW-Extension Horticulturist

The art of progress is to preserve order amid change and to preserve change amid order.

Author Unknown

Crop Forecasting

For the past three years, square foot samples have been harvested from our marshes during the same calendar timing, the end of August and the first week of September. These fruit samples have been counted and weighed in an attempt to forecast the crop in designated beds.

The following table highlights average number of berries per square foot and the average berry weights. For an added measure, I felt that the ranges were important as well. Just look at the average berry weights from one year to another!

In 1991 the table represents 144 square foot samples. 1992 represents 196 samples and 1993 represents 304 square foot samples.

The 1993 crop does not show a great deal of color, yet. Therefore, at this time sizing is still continuing. Ben Lear is usually the first to show brown seeds in the seed cavity, which is an indication that maturity is coming quickly, but we have to search for brown seeds this year. With this beautiful growing weather, our plants are still allowing the crop to size. Harvest is but a month away and who knows where our per berry weight will end up!

Jayne Sojka, Lady Bug IPM

Lady Bug Integrated Pest Management

Crop Forecast Comparison
1991, 1992, 1993 berry counts and weights.

Cultivar	Mean fruit per sq. ft. (no.)	Range	Mean wt per berry (g)	Range	Mean wt. per sq. ft. (g)	Mean bbl per acre	Range
1991							
Stevens	153	67-219	1.38	1.05-1.63	213	205	88-308
Searles	138	85-238	1.13	0.89-1.28	158	152	76-266
Ben Lear	177	100-319	1.2	1.07-1.32	212	204	112-341
Crowley	173	99-200	1.0	0.88-1.18	173	166	100-209
McFarlin	134	97-157	1.13	1.06-1.24	153	147	103-194
1992							
Stevens	156	52-251	1.12	0.95-1.32	175	168	52-277
Searles	130	75-167	0.92	0.76-1.1	118	113	57-155
Ben Lear	137	101-199	0.97	0.83-1.17	133	12847	94-189
Crowley	61	17-101	0.84	0.75-0.99	49	47	16-76
McFarlin	183	141-223	0.80	0.58-0.95	147	141	106-189
LeMunyon	112	23-200	1.2	1.06-1.3	134	129	25-239
1993							
Stevens	120	57-252	1.18	0.92-1.57	139	134	63-312
Searles	106	38-161	0.93	0.65-1.21	100	96	30-171
Ben Lear	137	66-239	1.08	0.89-1.21	147	141	71-259
Crowley	86	42-121	0.99	0.76-1.24	84	81	67-94
McFarlin	109	27-174	0.83	0.69-1.17	86	83	32-124
LeMunyon	89	36-166	1.33	1.25-1.4	124	23	39-233

Pre-harvest Pesticide Application Intervals

The final residue of any pesticide applied to a crop is determined by the total amount applied and the time elapsed since application. Weather and management practices also affect final residue amounts. The amount of residue allowed at harvest for any labeled pesticide for any crop must be below tolerances set by the US Food and Drug Administration. Preharvest intervals will soon be listed on every pesticide label along with a prescribed re-entry interval. With harvest approaching growers should be very cautious of not encroaching on preharvest intervals. The table below lists reentry and preharvest intervals for common cranberry pesticides.

Trade name	**Reentry interval**	**PHI (**days)
2,4-D	When Dry	NA
Orthene	24 hours	90; only 1 application per season
Guthion	24 hours	21
Sevin	When Dry	1
Bravo	24 hours	50
Lorsban	24 hours	60
Diazinon	24 hours	7
Copper	When Dry	exempt
Casoron/ Norosac	NA	NA
Carbamate	When Dry	Do not apply later than 28 days after mid bloom
Fusilade 2000	When Dry	365
Roundup	When Dry	30
Dithane Manzate Penncozeb	24 hours	30
Marlate	When Dry	14
Devrinol	NA	NA
Evital	NA	NA
Poast	When Dry	365
Funginex	When Dry	60

The Wisconsin Cranberry IPM Newsletter is published twice a month between May and September and is a cooperative effort of the University of Wisconsin-Extension, Ocean Spray Cranberries, Inc., The Wisconsin Cranberry Board, Inc., Cliffstar, Inc. and private crop consulting services. Editorial office is 1575 Linden Drive, Madison, WI 53706-1590. (608) 262-9751.

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Education is what a fellow gets reading the fine print and experience is what he gets by not reading it

Author unknown

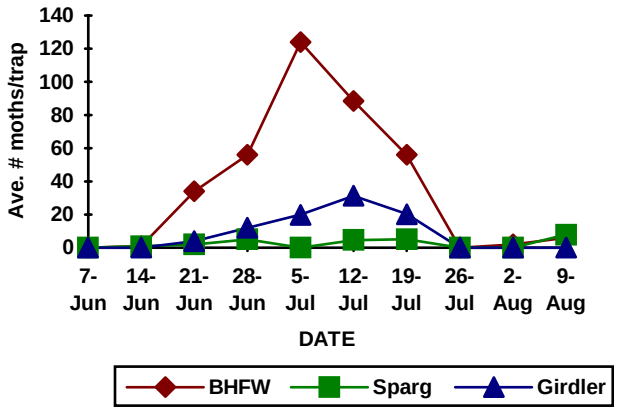
1993 PHEROMONE TRAP COUNTS

Cranmoor area includes:	Wood, Portage and Adams
Warrens area includes:	Jackson, Monroe, and Juneau
Northeast area includes:	Vilas, Forest, Oneida, Lincoln and Price
Northwest area includes:	Douglas, Burnett, Washburn, Sawyer, Barron and Rusk

Please note that different regions may have different scales on the left axis. Doing this allows greater accuracy in determining actual values within a region. However, comparisons between regions are more difficult. Please use caution in making comparisons of these averages to trap counts on your marsh.

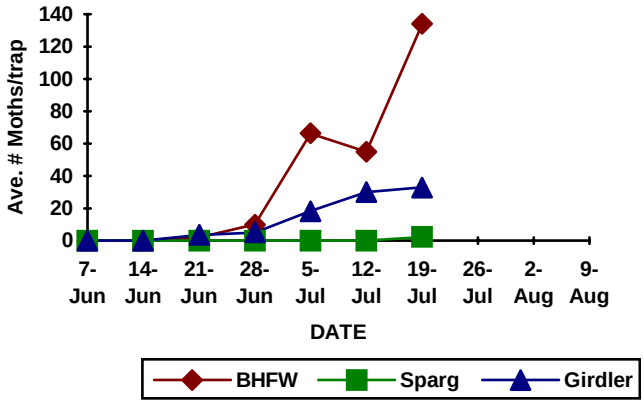
Means from 25 growers

Northwest Area



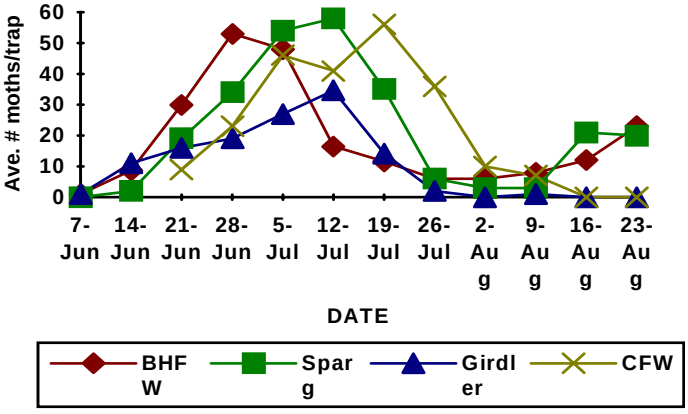
Means from 9 growers

Northeast Area

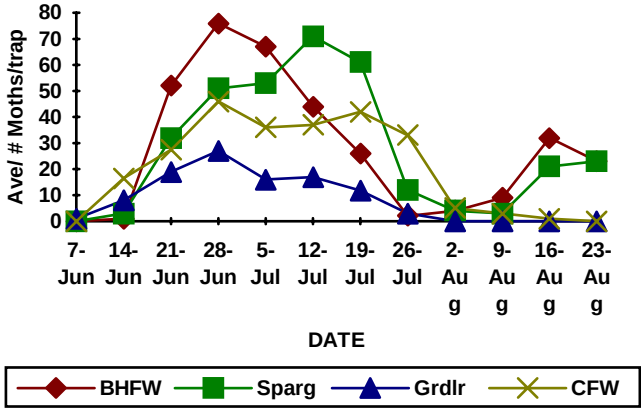


Means from 8 growers

Warrens Area



Cranmoor Area



Means from 26 growers

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