

A newsletter for the cranberry growers of Clement Pappas & Co., Inc.

Keeping Quality Forecast



Frank Caruso.

The following is an article on "The History of the Cranberry Keeping Quality Forecast" by Dr. Frank Caruso, plant pathologist at the UMASS Cranberry Experiment Station in Wareham, MA. Each year at this time of year, growers and others begin speculation on the rot potential and potential keeping quality of the crop and reference is often made to the "Keeping Quality Forecast". In the following article, Dr. Frank Caruso describes the history of the model and how it works, so the next time we refer to the "Keeping Quality Forecast", we'll know exactly what we're talking about!! B. Peterson

Prior to the 1920's, all cranberries were dry harvested, primarily with hand-held scoops or rakes of various designs. The practice of water-raking (removal of the berries while the bed is flooded) was initiated in Wisconsin at this time, and this led to discussion on the keeping quality of the berries after harvest. Except for Wisconsin, cranberries were dry harvested in all other areas until the late 1960's. In the early 1920's, Neil Stevens and Henry Franklin devoted considerable time to the rots that developed after picking, and to the various factors that affected the keeping quality of the fruit in Massachusetts. They noted that the cranberry had much better keeping quality in certain years; the 1920 crop was of unusual excellence whereas the 1914 crop was of terrible quality. Using the reports of H.S. Griffith, Chairman of the Board of Inspectors of the New England Cranberry Sales Company and exhaustive weather records held at the Mass. Cranberry Experiment Station, they concluded that weather conditions were closely linked to keeping quality. The conditions that favored good quality were a cool May and June followed by a warm July and August. Conversely, the conditions that favored poor quality were a warm May and June followed by a cool July and August. Stevens and Franklin made their first tentative forecasts of the crop's keeping quality in 1923, based on the weather during the months of May through August and on incubator tests of berry samples. The incubator test consisted of holding a pint of sound cranberries at a temperature of 32°C for one week and then noting the percentage of decayed berries in each sample. The rot that developed in this test was found to closely correlate with the rot that developed

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Upcoming Events:

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| June 21 | UMASS Lab Workshop on Sparganothis Fruitworm. | |
| | UMASS Cranberry Experiment Station | Wareham, MA |
| Aug. 22 | CCCG's Summer Meeting and Bog Tour | |
| | UMASS Cranberry Experiment Station | Wareham, MA |
| Aug. 28-29 | CMC Summer Meeting | La Crosse, WI |
| Aug. 29 | Cranberry Institute Meeting | La Crosse, WI |

Important Pesticide Information from The Cranberry Institute

Jere Downing

Important changes from last year:

United States:

Guthion products will be cancelled for cranberry use at the end of the 2006 crop year. Plan to buy no more Guthion than you can use this season, and plan to use all that you have in your possession. Guthion will not be allowed for use on cranberry after September, 2006. The same is true for **Sniper** products, which are also Guthion formulation.

Orthene will only be available in the "97" formulation; the old "75" formulations have been discontinued. You may and should use up the "75" formulations that you may have on hand. A state label in **New Jersey only** allows for the shorter 75 day PHI, but you are limited to only one application whether you choose the 75 or 90 day PHI.

Bravo 500 has been discontinued, but you can use up existing stocks (still listed on the chart). **Bravo Ultrex** and other chlorothalonil products including **Equus** are still registered and available for use on cranberries.

New for 2006:

Smolder bioherbicide for dodder control is recently registered, but the registrant wants to conduct demonstration field trials in 2006 before the product will become widely available. *(Continued on page 2)*

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in the common storage facilities. He concluded that the same methods used in Massachusetts could not be used in New Jersey because more rot was found in the incubator tests than was found in the storage facilities and that fungi growing at high temperatures were more prevalent. Although it was originally thought that rainfall might play a significant role in the keeping quality, Stevens found no direct correlation between the total rainfall and the number of rainy days.

In 1943, Stevens noted that there was a constant trend toward better handling of the fruit, primarily due to the general use of trucks in hauling cranberries from the bog to the screenhouse (where they were cleaned of leaves and weeds) and from the screenhouse to the handler's facility. In addition, the introduction of belt screens, the improvement of ventilation and temperature control when the berries were in storage also helped to prolong the fruit quality. In the field, the increased use of fungicides and floods held in the spring by the growers also contributed to better quality. On the basis of decades of observations, Stevens concluded that the worst possible combination of circumstances leading to poor keeping quality were (1) high temperatures in May and June, (2) a greater than normal number of days with 0.01 inch or more rain in July and August, and (3) an unusually large crop. This was the exact scenario in two "poor" years, 1914 and 1931. Of these three factors, the early-season temperatures were deemed the most critical factor. From 1923 to 1928, a general forecast was made between September 10 and 15, but in 1927 separate forecasts were issued for early and late varieties, those occurring between September 10 and 15 and October 10 and 15, respectively. These predictions were more useful to the handlers than they were to the growers. Such forecasts continued until 1935 when Stevens took another position outside the cranberry industry. The general interest in the keeping quality also decreased due to the increased importance of canning that offered an alternative to fresh fruit. However, the 1942 crop was an especially poor crop and the interest in putting out a forecast returned.

Using data developed by Franklin and Cross, beginning in 1949 a preliminary keeping quality forecast (KQF) was issued in early April and a final KQF was issued in early June. This was possible because many of the

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Important Pesticide Information from The Cranberry Institute

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Northeast:

Devrinol 50 DF (MA only) is now available.

Diazinon 14G SLN in MA expires on July 1, but efforts are underway to renew that state label. We will notify you once the label is approved.

3M Sprayable Sparganthis mating disruption pheromone product has been discontinued and deleted from the chart. If it becomes available, or if you have the material on hand, it can be used.

Wisconsin:

Weedar 64 has been deleted from the chart, but the SLN application for renewal is in process. You will be notified when the SLN has been approved.

Ferbam Granuflo has been deleted from the chart, and the registrant will not register in WI.

Canada:

The 3M Sprayable Pheromone Mating Disruption product (Code 120) for Blackheaded Fireworm control remains on the chart for 2006, but the product may be difficult to source. 3M Canada has not formulated any product in recent years, but if the product is available, it is approved for use.

Guthion and Sniper products (azinphos methyl)(Codes 230, 231) are expected to be phased out in Canada by the end of 2007. If you own or purchase these products, plan to use up your inventory by the end of the 2007 crop year. Any remaining Guthion or Sniper product will not be allowed for use on cranberry after that date.


There may be other minor but important label changes on other products, such as rate or REI changes from 2005. Be sure to read the label before using any pesticide. The Pesticide Chart is meant only as a reference guide. 

Table 1. Keeping quality forecasting system developed for and currently used in MA.

Factor	Question	Decision, Points	Cum. Points
a) Sunshine during the previous crop year ¹	Sunshine above average, Y/N	if N, 4 points	
b) Sunshine in Feb. ²	Sunshine below average, Y/N?	if Y, 1 points	
c) Sunshine in Mar. ³	Sunshine above average, Y/N?	if Y, 2 points	
d) Temperature in Mar. ⁴	Temp. below average, Y/N?	if Y, 2 points	
e) Precipitation in Mar. ⁵	Rainfall below average, Y/N?	if Y, 1 point	
Preliminary total			10 points
f) Temperature in Apr. ⁴	Temp. below average, Y/N?	if Y, 2 points	
g) Precipitation in Apr. ⁵	Rainfall below average, Y/N?	if Y, 1 point	
h) Temp. in May ⁴	Temp below average, Y/N?	if Y, 2 points	
i) Precipitation in May ⁵	Rainfall below average, Y/N?	if Y, 1 point	
Final total			16 points

¹Sunshine for the previous growing season was related to a large crop for the current year and large crops seldom kept well.

²Sunshine could lead to possible oxygen deficiency in the floodwater and result in a crop of smaller berries.

³Abundant sunshine in March was favorable to good quality.

⁴Cool temperatures repress fungal development and contribute to good keeping quality.

⁵Drier than normal conditions promote less favorable conditions for rot fungi.

Grower Profile: The Hannula Family, Carver Massachusetts

The Hannula's have been growing cranberries in Southeastern Massachusetts and adapting, as needed, for five generations. The current Hannula's growing cranberries include brothers, Wayne and Ward and Wayne's son, Scott. Scott's son, Craig, is also now working on the farm, and if he decides that cranberry growing is agreeable with him, will be the fifth generation to grow cranberries in Southeastern Massachusetts.

Cranberry Growing, especially in Massachusetts where older less productive bogs are more common, has seen its share of challenges, especially during the early part of this decade, as market prices responded to increasing national supply. The Hannula's reacted and diversified by putting their cranberry equipment to work doing sand and gravel and excavating work. When cranberry growing was more profitable, the Hannula's reinvested in newer, better earth moving and excavating equipment. Today, this equipment is more than paying for itself. Scott spends the majority of his time running the sand and gravel business while Wayne and Ward concentrate on



Craig, Scott, Wayne and Ward Hannula from So. Carver, Massachusetts

the cranberries. Scott also serves as a Massachusetts Independent member on the Cranberry Marketing Committee.


Wayne and Ward's official corporate farming relationship began in 1976 when they and their father formed Oiva Hannula and Sons, Inc. The family history in cranberry growing however goes back further than that. Their step-grandfather started bogs in the 1920's. Their father, Oiva, started farming cranberries in Massachusetts after WWII. Oiva managed bogs for his step-father, and supplemented his income by doing custom work with a bulldozer that he bought. During the 1950's, Oiva began buying and selling bogs, doing more buying than selling. Oiva also had good mechanical

aptitude and a knack for fabricating. Oiva made 39 self propelled sanders from milk trucks. He later bought old motorcycles and made 3-wheeled "wheel-off rigs" which were used to transport dry-picked fruit off the bogs. A November 1960 cover article in the Cranberries Magazine highlighted Oiva's mechanical skill as he applied it to cranberry equipment and also mentions him as a person eager to help others.

Oiva was also one of the pioneers in using underground irrigation systems on bogs. In more recent years, Wayne and Scott have flown materials on and off the bogs by helicopter, but still maintain some of the farming practices established by Oiva.

Wayne and Ward describe their father as a man who was readily available to lend a helping hand. He had a desire to help other growers. The current Hannulas are also people who are well liked and respected in the community. In visiting with the Hannula's it is apparent that they generally assume the best about other people. The Hannula's long term relationship with their employees shows that they value people and friendships. Wayne Shaw, Don Hitchcock ("Knucky"), and Miguel Sandel have 19, 27, and 30 years respectively working with the family.

Today, the Hannula's farm about 220 acres of cranberries and split their deliveries between Decas Cranberry and Clement Pappas & Co. They grow Early Blacks, Howes, Ben Lear and Stevens as well as a smaller amount of some other varieties. The Hannula's have also embarked on a long-term renovation project to transition some of their older bogs to higher yielding varieties.

For the Hannula's, cranberry farming is not only a family history and way of life, it's a tradition that they hope continues for generations to come. 



Julio Vazquez and Ken Bragdon are getting an early start on bin repair at the Massachusetts Receiving Station.

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factors that bore a close relationship to the keeping quality of a crop occurred well in advance of the harvest of the crop. The preliminary forecast was issued early enough for growers to consider the use of late water, a flood utilized solely in Massachusetts wherein the bed is flooded from mid-April until mid-May. The flood disrupts the life cycle of many of the fruit rot fungi, leading to better fruit quality and fewer fungicide applications. The final forecast was issued two weeks prior to the time of the first fungicide applications for fruit rot management. The forecast involved a point system, with 10 potential preliminary points and a final total of 16 points. The weather factors involved in the preliminary and final forecasts are presented in Table 1. (See page 2) The forecast was issued by C.E. Cross from 1949 until 1970, by I.E. Demoranville from 1971 until 1996, and by F.L. Caruso from 1997 until the present.

The success rate of the keeping quality forecast has reportedly been better than average throughout its history. In those years where the forecast was erroneous, these factors may have been responsible: cloudy, humid, rainy

weather during bloom (resulting in poor pollination); extensive periods of cloudy weather in July and August; hot, humid conditions in August and September. The final quality of the berries may also be much better in the end due to the increased use of fungicides for fruit rot control, as growers compensate in those years wherein there is a forecast for below average quality. Because cranberry cultivation is very different than it was in the 1940's, the accuracy of the KQF during its existence and particularly during the past 15 years is currently being evaluated. The KQF is also trying to be adapted for its use in New Jersey, Wisconsin, Washington and Oregon. These other growing areas have significant differences to Massachusetts; *e.g.*, beds are not winter-flooded in Washington and Oregon, beds are flooded into late April with minimal ice during many winters in New Jersey, and beds in Wisconsin have very thick ice layers that take long durations to thaw in order to expose the vines. There are many other differences in cultural practices used in each area that may impact the feasibility of effectively using the KQF as used in Massachusetts. 