

# Cranberry Crop Management Journal

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Editor:

**MATTHEW LIPPERT**

Agriculture Agent  
Wood County UW-Extension  
400 Market Street  
Wisconsin Rapids, WI  
54494  
(715) 421-8440  
[mlippert@co.wood.wi.us](mailto:mlippert@co.wood.wi.us)

## REFLECTING ON THE 2017 GROWING SEASON IN WISCONSIN

by Lindsay Wells-Hansen  
Ocean Spray Cranberries

I recently came across an article in the December 1963 issue of Cranberries Magazine that was written by G.C. Klingbeil who served as an extension horticulturalist at UW-Madison at the time. The article (*page 2*) titled *Recent Developments in Cranberry Production in Wisconsin*, reflects upon the state of the WI cranberry industry in 1963 compared to the early 1900's. What struck me about this article was this: if I were tasked with writing an article of similar nature today, the numbers and names would change, but the overarching themes would remain the same.

That is to say, many of the topics mentioned in the original article remain pertinent in 2017. Klingbeil discusses the trends of increasing and subsequent leveling off of yields, the introduction of new cultivars, advances in harvest methods and machinery, and refinement and improvement of weather forecasting techniques. Weeds, insects, and diseases were considered among the leading field challenges at the time, and although we have more targeted and effective tools to manage these pests in 2017 than we did in the 1960's, these pests remain at the forefront of growers' and researchers' thoughts each year.

Today, production and marketing remain high on the list of challenges currently facing the industry, just as they did over a century ago. Yield continues to increase as new cultivars are introduced and management practices improve, despite Klingbeil's observation that yields seemed to be leveling off in the 1960's. With an average yield of 90 barrels per acre produced in WI in 1960, it would have been difficult to imagine a time in which some beds would yield over 600 barrels per acre! It is remarkable to think about the many changes and advances that have been made in the last several decades, but it is also remarkable to realize how many things have remained the same.

The 2017 Cranberry Research Roundtable, recently held on the UW-Madison campus, provided researchers, growers, and crop consultants with the opportunity to discuss successes and challenges that arose in the 2017 Wisconsin growing season. As the group reflected on prior growing seasons, the topics covered included some of those mentioned above, but the importance and management of fruit quality attributes, including fruit color and size topped the list.

Cultivar plays an important role in fruit quality attributes, especially color and size, but weather events that are beyond our control affect quality substantially. Because fruit color plays such an important role in the processing of cranberries, it is often one of the leading

(continued on page 3)

# Recent Developments In Cranberry Production In Wisconsin

G. C. Klingbeil, Extension Horticulturist  
University of Wisconsin

Seventy-six years ago (January 5, 1887) a group of cranberry growers established the Wisconsin State Cranberry Growers' Association. J. H. Treat was elected president.

The first article of organization was as follows: "To advance the interest of all engaged in the cultivation of cranberries in this state by obtaining statistics and information of the condition of the crop in this and other states, from time to time; by establishing and taking measures to insure the confidence of dealers and purchasers by this evidence of fair and honorable dealings; to enlarge the area of the market for this fruit through definite and direct action; and generally, by all legitimate and honorable means to advance the interests of the cranberry cultivator."

It would appear that three quarters of a century ago the problems of the industry were little different than the problems of today: production and marketing. It is obvious that the industry has progressed. No obstacle has been insurmountable; the drought and fires of the thirties, war and ridiculously high prices of the forties, change to mechanization and "Black Monday" in the fifties are but a few. We know there will be new developments in the sixties. Dr. George Peltier, association historian, is compiling documents that tell of the many developments that have occurred in this industry. My purpose is to briefly look at the past, review recent developments, and attempt to look into the future.

I would like to remind that in Chapter 94 of the Wisconsin Statutes 94.26 through 94.35 there are several paragraphs that are not new but should be familiar to every Wisconsin cranberry grower. To my knowledge cranberry growers are the only one privileged to build dams and ditches on waterway. With public interests in water today; guard this privilege zealously.

Let's first look at the acreage in Wisconsin: 1928, 2,200 acres; 1948,

2,800 acres; 1952, 3,700 acres; 1957, 4,000 acres; 1962, 4,500? acres (5,100 + total bearing and nonbearing)

Cranberry yields per acre: 1900, 15 bbl. per acre; 1920, 18 bbl. per acre; 1930, 16 bbl. per acre; 1940, 48 bbl. per acre; 1950, 63 bbl. per acre; 1960, 90 bbl. per acre.

Cranberry varieties and per cent of total acreage for 1962: Searles, 62-65 %; McFarlins, 20-23 %; Natives, Less than 10 %.

## Yield Leveling Off?

These figures indicate that acreage is continuing to increase. The acreage could double by developing lands now in the hands of growers. Yields per acre have increased markedly in the past decade but appear to be leveling off. The major variety being planted is Searles, probably because it is the best yielding variety. There is considerable interest in the early maturing variety, Ben Lear, and likely within the next few years there may be 75-100 acres planted. The variety ripens early and yields reasonably well. The Stevens variety, because of its quality, is being planted as vines become available.

Weeds, insects, and diseases continue to be major field problems. Insects have been controlled by the phosphate poisons largely in the form of dusts. Dr. John Libby, Extension Entomologist, recently appointed, will be working with us on insect control problems. Application methods of pesticides are not uniform. The most effective method of applying solvents is the undervine boom; other herbicides are applied in low gallonage sprays and some as granules. The Chemi-Caster made by the Noble Manufacturing Company is being used quite widely for applying granules. As in all methods of pesticide application proper calibration is important.

Harvesting methods have changed greatly. About 1910 handraking on the flood became established and for 40 years was the standard method of harvesting. Machine raking was

introduced in the 1950's and today over 95 % of the crop is machine raked. The Case picker modified into a self-propelled unit and the Getsinger Retracto tooth picker are the most commonly used. The Getsinger picker will probably soon be self-propelled. Field air drying accompanied wet raking until the event of machine raking. Today probably 95 % of the crop is mechanically dried by modified crop driers.

Cranberries have long been stored in drying crates. Today there is much interest in bulk storage. Bob Gattchalk and Winnebago Cranberry Corporation both in the Cranmoor area are testing the method in volume. In my opinion we will see in the next few years a larger volume of berries stored either in pallet boxes holding five barrels or more or in bins holding 1000 barrels or more.

Weather forecasting techniques have certainly been refined to provide more accurate frost forecasts. There is not a complete agreement on how to financially support the frost warning services, but this is a minor problem. Several growers are using net radiometers to forecast temperatures with great accuracy. Newell Jaspersen at Cranmoor and Al Amundson of Babcock are using this valuable tool with confidence. Several more growers established these instruments in 1962.

Flooding is still the standard means of frost protection but the use of sprinklers for frost protection is increasing.

Since 1910 growers are sanding on a regular schedule. There is no change in this practice. Most growers are using either nitrogen or a complete fertilizer to obtain the desired annual vine growth. No blanket fertilizer recommendations are made due to the great physical variations between marshes.

## To Reduce Shrinkage

I look forward to changes in grading and storage procedures and positive action to reduce the amount of shrinkage due in part incurred to rough handling and poor storage conditions. These are but a few of the developments in the Wisconsin cranberry industry. I am certain of more improvements in production methods in this decade.

determinants in when growers harvest their fruit. Although all factors that contribute to cranberry color development are not well known, cool temperatures are believed to be one of the primary environmental drivers of color development. Lower than normal temperatures throughout August in central and northern Wisconsin contributed to berries beginning to redden early, leading many in the industry to believe this would be a “good” color year. However, above-average temperatures in September and October slowed color development in several varieties, namely ‘Stevens’, and many growers delayed harvest of some beds to wait for color development. Alternatively, early-maturing varieties such as ‘HyRed’, ‘Ruby Star’, and ‘Crimson Queen’ reached peak color in early to mid-September. Not all receiving stations were open at that time, and fruit was overripe upon delivery for some growers.

While some growers experienced average berry size and good yields in 2017, many in Wisconsin saw a different trend. On some marshes, a higher than average number of berries were set, but the fruit remained small in size. Alternatively, fruit size was average or above average on marshes on which fewer berries were set. Cool spring and summer temperatures affected fruit size across the state. Cell division occurs during early fruit set; cool temperatures during this period of growth can slow the rate of cell division, resulting in fewer cells. Thus, even if temperatures increase later in the season, there are fewer cells to enlarge, and berries are ultimately smaller. As such, applying more fertilizer in an attempt to increase fruit size later in the season is often a fruitless effort, as many growers have seen.

As ‘unusual’ weather patterns become the new ‘normal’, it will become increasingly important for growers, researchers, and crop consultants to continue to adapt and innovate as new challenges arise. I hope reading Klingbeil’s article provides you with the opportunity to positively reflect on the numerous changes and advancements that have been made in the industry over the years and encourages all of us to continue to improve.

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## **SUPPRESSION OF CRANBERRIES GROWN FROM SEED BY PRE-EMERGENT HERBICIDES**

by Jed Colquhoun and Rich Rittmeyer  
University of Wisconsin-Madison

*\*Preliminary Results-as always, read and follow the pesticide label!*

Earlier this year, there was a discussion among cranberry consultants, university cranberry specialists and cranberry growers about the potential for "genetic drift" in a cranberry variety within a bed. In other words, could the cranberries that move among beds in flood water or on equipment then germinate as seed, become established and result in a varietal

"mutt" among vines within a bed? Furthermore, has a shift in herbicide use toward more mesotrione (i.e. Callisto and other labeled products) and less Casoron or Devrinol potentially increased the risk of varietal impurities?

In response, we conducted a study to first see if the herbicides mentioned above affected cranberry emergence from seed. We didn't address the likelihood that these seedlings become established in a bed, but the results of this first step were very interesting.

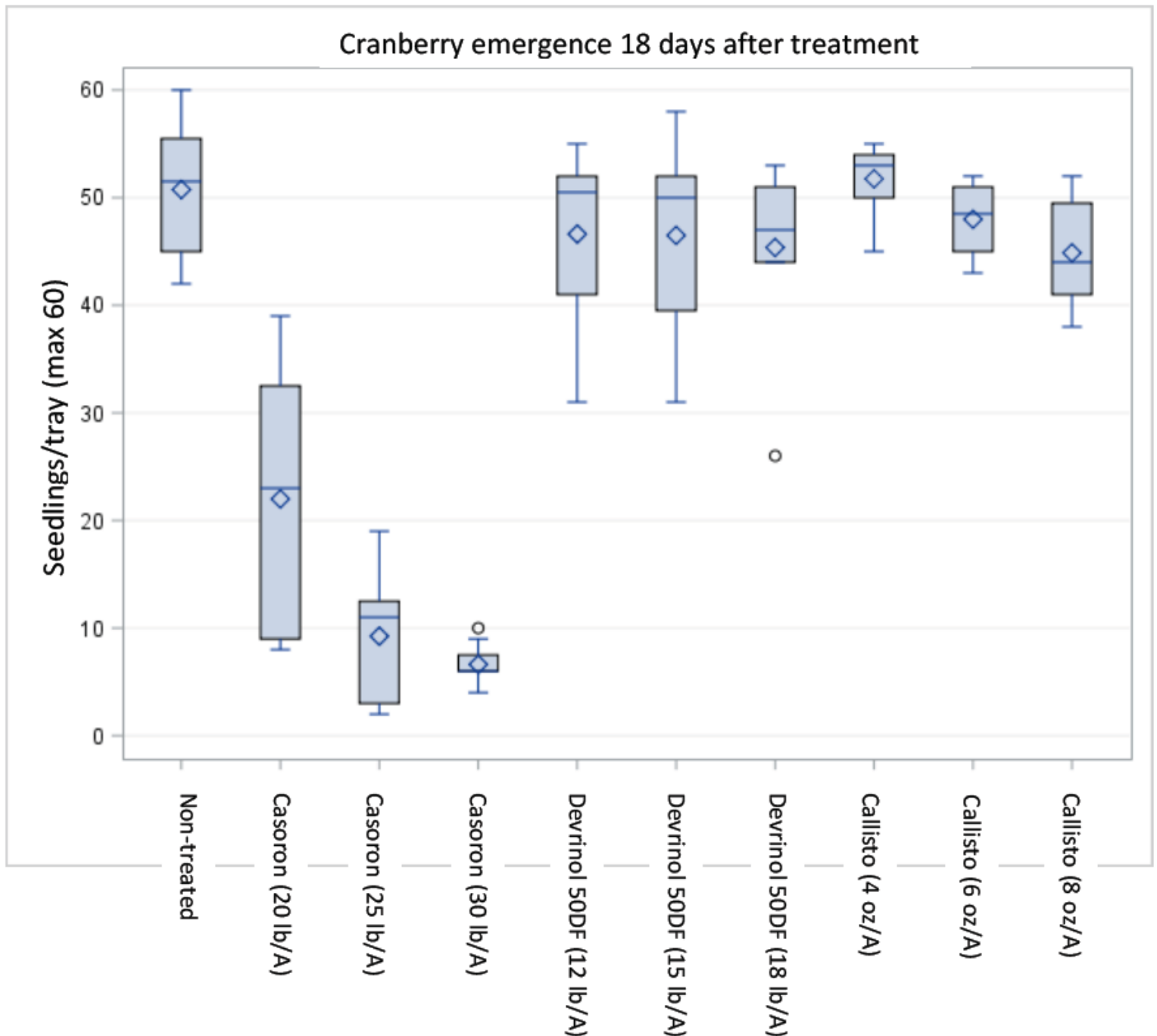
**Methods overview:** seed was collected from 'Stevens' cranberry and dried at ambient temperature. Three seeds were placed in a Jiffy peat plug, with 20 plugs per treatment replicate in greenhouse



trays filled with potting mix (see photos to the right). Four replicate trays were included for each treatment. Treated trays were sprayed with pre-emergent herbicides applied at 20 GPA. Each tray was overhead-irrigated with the same amount of water on a daily basis. Cranberry emergence was quantified 18 and 28 days after treatment. The study was then repeated, with the combined results presented here.

**Results summary:** Casoron herbicide reduced seedling cranberry emergence compared to the non-treated plugs (see figure below). Cranberry emergence was similar among the non-treated plugs and where Devrinol or Callisto were applied. A rate response within the Casoron treatments was also observed, where seedling emergence and the variability in control both lessened as the rate increased.

These results provide another great example of why all of the tools in our pest management tool box have value, and not only from the standpoint of selecting for resistant pests through over-reliance on individual active ingredients. A balanced weed management program that includes multiple active ingredients with different modes of action in rotation enhances the control spectrum, including seedling cranberries that could potentially affect varietal purity and the costly investment associated with bed planting.



## 2017 CROP REVIEW AND OBSERVATIONS

by Suzanne Arendt  
RedForest Crop Consulting, LLC

The 2017 cranberry harvest was characterized by two major components, overall decrease in grams per berry (lower yields) for some growers and delayed start up due to poor color development for most. Berry size has consumed my thoughts as a grower. Some beds had average-to-good size and others were well below my expectations. When I last visited growers in mid August, it was apparent on some marshes that berry size was down and on others berry size looked to be on track. Efforts to increase berry size through more irrigation, more Potassium (K) and more Nitrogen (N) were pretty much futile, as they have been in past years when this happened. Also, waiting to harvest until the third week in October did not yield statistically significant improvements to berry size either. Nothing is ever black and white in farming and we are always at the mercy of mother-nature. However, we are also limited by our known or unknown mistakes we make in growing cranberries as well as the genetics of the variety and the surrounding environment.

There are many factors that contribute to a bumper crop or one much less desirable, but in general, there are external and internal cues which influence the size of berries at harvest time. External cues would be environmental (growing degree days, rainfall, drought), fertilization, irrigation, pollination and other grower inputs. Internal cues have to do with genetics, mineral limitations, hormones and cell formation, division and expansion. External cues can sometimes be easily identifiable when looking back on a season, but internal cues are ones that are difficult to understand and the plant itself can change a hormonal response based on an external cue or stimuli. There are a vast amount of variables to consider when reflecting on a crop, and this year proved that all these factors and possibly more affected individual grower yields.

Environmental conditions for the growing season were generally cool and wet. The spring was cool and cloudy. Weather conditions during bloom have to be observed more specifically on a geographical level. In the Mather area for example, early bloom was moderate-to-cool with rain. During mid bloom, we saw moderate temperatures also with rain. Late bloom was characterized by moderate to some days over 80 degrees with higher humidity. In early sizing, we saw moderate temps with a mix of sun, rain, and clouds and by August, we had cooler days and nights along with more clouds. Temperatures didn't start to warm up again until September where we probably saw the warmest daily temperatures of the season. I think the cool and cloudy spring along with the cool August were two significant contributors to crops being down and to smaller berry size.

Over the next few months, I plan to look deeper into berry size versus yield versus inputs and environmental factors from the 2017 growing season. I hope to be able to sit down with a handful of growers to talk about the season and their experiences. In general, a larger average sized berry usually correlates with higher yields. Pollination and fertilization timing at set are two critical components to yield, but I hope to find more insight on determining and possibly manipulating berry size.

*INTEGRITY is choosing your thoughts  
and actions based on values rather than  
on personal gain.*

# GROWER UPDATES

## DUBAY CRANBERRY

Hope everyone had a chance to relax with family and friends to celebrate Thanksgiving. For those who enjoy hunting, I hope you had a safe and successful time in the woods. As the year winds down and daylight hours start to wane, activities around the marsh do also. Roads have been repaired and leveled, bulkheads replaced, harvest equipment stored away, and jobs that were pushed off till after harvest are slowly getting done. With the cold temps that we had at the end of harvest, I thought maybe we would be able to make some ice early. But this is Wisconsin and temps have warmed again above normal, hopefully not for long. With the end of the year fast approaching I would to thank you for the opportunity to contribute to the cranberry journal. I wish everyone a blessed Christmas and a Happy New Year.

**Dave Hansen**

## SARATOGA CRANBERRY COMPANY

Not much to report here in Saratoga. Like all the growers in Central Wisconsin, we are patiently waiting on the weather to freeze. Looks like the second week of December might have the winning temperatures to start the process. Thanks for reading my journal entries in the newsletter, good luck on the winter flooding, and hope to see everyone at the WSCGA winter school!

**Russell Sawyer**



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### UW-Extension Cranberry Specialists

**Jed Colquhoun**

*UWEX Fruit Crops Weed Scientist*  
1575 Linden Drive  
Madison, WI 53706  
(608) 852-4513  
jed.colquhoun@ces.uwex.edu

**Patty McManus**

*UWEX Fruit Crops Specialist & Plant Pathologist*  
319B Russell Labs  
1630 Linden Drive  
Madison WI 53706  
(608) 265-2047  
pmmcmanus@wisc.edu

**Christelle Guédot**

*Fruit Crops Entomologist/  
Pollination Ecologist*  
Department of Entomology  
546 Russell Laboratories  
1630 Linden Drive  
Madison WI 53706  
(608) 262-0899  
guedot@wisc.edu

**Amaya Atucha**

*Extension Fruit Crop Specialist*  
UW-Madison  
297 Horticulture Building  
1575 Linden Drive  
Madison, WI 53706  
(608) 262-6452  
atucha@wisc.edu

**Shawn Steffan**

*Research Entomologist*  
USDA-ARS  
UW Madison, Department of Entomology  
1630 Linden Drive  
Madison, WI 53706-1598  
(608) 262-1598  
steffan2@wisc.edu

**Juan E. Zalapa**

*Research Geneticist*  
299 Horticulture  
1575 Linden Drive  
USDA-ARS Vegetable Crops Research  
Madison, WI 53706  
(608) 890-3997  
jezalapa@wisc.edu