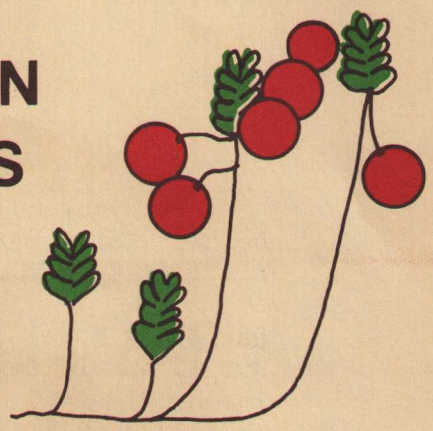
WISCONSIN CRAN TIPS



July, 1986

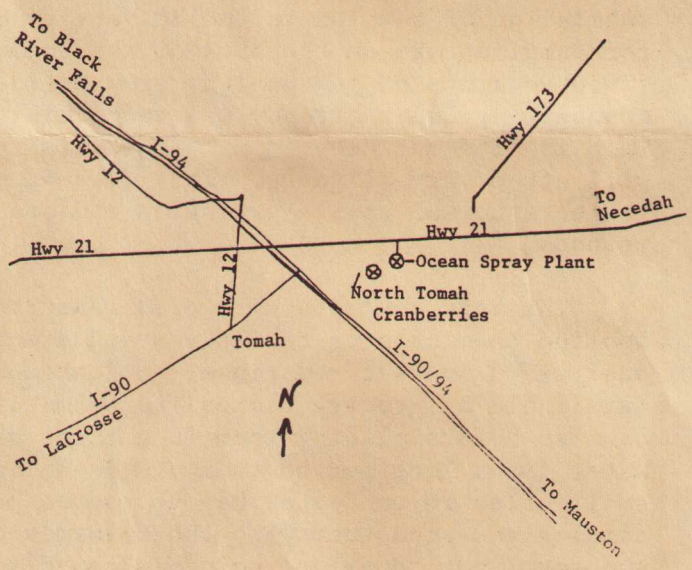
Dear Wisconsin Cranberry Grower:

Post bloom indications are for a good to excellent cranberry crop statewide. Fruit set is about normal with very good early berry size. Growing degree days (GDD) for central and northern Wisconsin as of July 16 were 13 to 20% ahead of the long term average and just slightly ahead of 1985 GDD on the same date. Recent high temps should raise the 1986 GDD even further ahead of normal. This results in excellent potential for good berry size, top fruit quality, strong upright growth and bud set for 1987. Water management, good pest control and to a lesser degree, late season fertilizer (nitrogen) management will determine your impact on this and next year's crop.

1986 WISCONSIN CRANBERRY FIELD DAY - AUGUST 6

Thanks to John Rezin and his family, the Ocean Spray folks, Dave Olson, Monroe County Extension, Larry Rezin and the rest of the WCGA program committee, plans for the Cranberry Field Day, August 6 appear to be complete. The field day promises to be another in the series of excellent educational and social activity. We hope you're planning to attend.

Headquarters for the field day is the new Ocean Spray receiving plant near Tomah (see map). The program begins at 9 am with registration and morning bus tours of Rezin's North Tomah Cranberry marsh nearby, guided tours of the cranberry receiving stations, helicopter rides (for a fee) and industry exhibits. More than 70 commercial exhibitors have already reserved space at the field day.



Luncheon tickets must be purchased at registration. The afternoon program includes a brief WCGA business meeting followed by a brief discussion on cranberry dam construction and safety by Will Lee, professional engineer.

continued . . .

For your convenience a list of some motels in the Tomah area is given below. For a list of campgrounds or other information concerning local facilities contact the Monroe County Extension office (Tel: 608-269-8722)

Day Break Motel
Hwy 12 and 16 East
Tomah, WI 54660
(608) 372-5946

Hillside Motel
Hwy 16 West
Tomah, WI 54660
(608) 372-5569

Holiday Inn
Jct I-94 & Hwy 21
Tomah, WI 54660
(608) 372-3211

Holiday Lodge
Wyeville, WI 54671
(608) 372-2671

Lake Tomah Lodge
Lake Tomah
Tomah, WI 54660
(608) 372-2358

Lark Inn
229 N. Superior Ave.
Tomah, WI 54660
(608) 372-5981

Park Motel
1515 Kilbourn Ave.
Tomah, WI 54660
(608) 372-4655

Pleasant Acres
Hwy 12 North
Tomah, WI 54660
(608) 372-9343

Red Gables
Route 2, Box 29
Hwy 12
Tomah, WI 54660
(608) 372-6868

Rest Well Motel
Hwy 12 & 16 East
Tomah, WI 54660
(608) 372-2471

Super 8 Motel
Hwy 21 & I-94
Tomah, WI 54660
(608) 372-3901

Tomah Courts
1509 Superior Ave.
Tomah, WI 54660
(608) 372-4174

We look forward to seeing you on August 6!

TIME FOR LEAF ANALYSIS

Mid July - early August is the proper time for foliar (leaf analysis) in cranberries. Enclosed is a plant tissue sample information sheet for submission of samples to the University of Wisconsin laboratory. Details for sampling are on the back of the form. A cranberry sample should include 35-50 segments of new upright growth (leaves and stems intact). Many cranberry growers already use commercial laboratory analysis services. This is fine but keep in mind analysis results from different laboratories will often vary slightly. This doesn't make them incorrect - it merely reflects normal sample variation and possible differences in analytical methods.

The leaf analysis will also measure nutrients or other externally applied chemicals on the leaves and stems. To avoid getting a misleading analysis I suggest you rinse the leaf and stem samples in distilled water (available at grocery stores) for 2 minutes, remove, drain and air dry the samples before placing them in a paper bag. Don't let the samples sit in water for a long period to avoid leaching nutrients out of the leaves. Make small holes in the paper bag to reduce possibilities for fungal growth on the samples and send them with the information sheet to the address indicated on the form (not to us). Include a check for $15 for each sample submitted. You'll receive a computer printout with the analysis results within several weeks.

PLANT TISSUE — SAMPLE INFORMATION SHEET

(Use a Separate Sheet for Each Field and Crop)

DATE _____

FARMER'S NAME AND ADDRESS

1. Name _____
2. Street, Route No. _____
3. City, State, Zip Code _____
4. Charge to account number: _____

If an account number is indicated, the results will be mailed to the account holder. If no number is indicated, prepayment is necessary and the results will be returned to the name and address indicated.

	OFFICE USE
Amount Enclosed $ _____	County Code _____

5. Field designation: _____
6. Crop: _____
7. Date planted: _____
8. Date sampled: _____
9. Stage of growth: _____
10. If abnormal plants are included as one of the samples, what percent of the total plants in the field are affected? _____
11. Plant part sampled *(check one)*: Leaves ☐ Stems ☐ Petioles ☐ Whole plant ☐ Top 6 inches ☐ Grain ☐
12. Position of plant part sampled:
    for corn *(check one)* Ear leaf ☐ Leaf below whorl ☐
    for fruit trees Current season growth ☐
    for vine fruit crops Mid-shoot leaves ☐
    for other crops *(check one)* Top ☐ Middle ☐ Bottom ☐

13. Sample location: County _____ State _____

14.

Sample number:	Plant appearance: Normal	Abnormal
	☐	☐
	☐	☐
	☐	☐

15. ADDITIONAL SOIL TESTS REQUESTED
    ☐ Calcium & Magnesium ☐ Zinc
    ☐ Boron ☐ Sulfur
    ☐ Manganese

SOIL SAMPLE INFORMATION

16. Soil type: _____
17. Drainage: Poor ☐ Fair ☐ Good ☐
18. Has drainage been provided? Yes ☐ No ☐
19. If yes, *check one:* Tiled ☐ Ditched ☐ Surface drained ☐
20. Is the field irrigated? Yes ☐ No ☐

CROPPING HISTORY INFORMATION

21. Previous crop: _____
22. Condition of previous crop: _____
23. Weather: Rainfall last 30 days:
    Below normal ☐ Normal ☐ Above normal ☐
24. Air temperature last 10 days:
    Below normal ☐ Normal ☐ Above normal ☐
25. Spray or dust applied to crop being sampled:
    Weed chemicals: Yes ☐ No ☐
    Insecticides: Yes ☐ No ☐
    Fungicides: Yes ☐ No ☐

FERTILIZATION HISTORY

26. For each nutrient applied indicate the method(s) of applicaton and amount of nutrient applied.

Nutrient	Broadcast	Row	Sidedressed	Amt. lbs/a
Nitrogen (N)	☐	☐	☐	_____
Phosphate (P_2O_5)	☐	☐	☐	_____
Potash (K_2O)	☐	☐	☐	_____

27. If any of the following secondary nutrients were applied, *check the appropriate box(es)*
    Calcium ☐ Magnesium ☐ Sulfur ☐
28. If any of the following micronutrients were applied, *check the appropriate box(es)*
    Boron ☐ Zinc ☐ Manganese ☐ Copper ☐

SOIL AND PLANT ANALYSIS LABORATORY
Soils Department, University of Wisconsin
5711 Mineral Point Road
Madison, Wisconsin 53705
(608) 262-4364

INSTRUCTIONS FOR PLANT SAMPLING

PLANT TISSUE SAMPLING:

(1) General Instructions:

Crop	Stage of Growth[1]	Plant Part	Number of Plants to Sample
Corn, sweet corn[2]	(a) prior to tasseling (b) at silk initiation	(a) fully developed leaf (b) ear leaf	(a) 15 to 20 (b) 15 to 20
Soybeans, snapbeans, lima beans[3]	prior to or during initial flowering	upper fully open trifoliate	20 to 25
Grains, forage, grasses	prior to heading	upper-most leaves	30 to 40
Alfalfa, other legumes	prior to flowering	top 6 inches	25 to 35
Potatoes	prior to and during flowering	recently developed leaves (petioles and leaflets)	40 to 50
Apples, cherries, pears, plums	current season's shoots taken July 1-15	fully developed leaves at midpoint on new shoots	4 leaves from each of 10-20 trees
Cranberries	current season's growth	newest terminal growth	35 to 50
Strawberries	current season's shoots	mature, fully developed leaves and petioles	5 leaves and petioles from each of 10-20 plants

[1]If plants are developing abnormally in the initial stages of growth, take the whole plant, remove the roots and submit the tops of the plants for analysis. Plants which have entered the reproductive stage are not suitable for sampling and analysis. *See instructions in (2) below.*

[2]Samples should not be taken after pollination.

[3]Samples should not be taken after pod set.

(2) For a plant ABNORMAL in appearance:
Take that portion of the plant exhibiting the abnormality and check the proper plant part selection on questionnaire. A better evaluation can be obtained when a comparison is made between samples taken from normal and abnormal plants in the same general area. Plants showing any abnormality should be sampled early since element accumulation usually continues even though the plant is showing abnormal growth.

(3) Do not sample or include diseased or insect damaged plants as a part of the composite sample.

PLANT TISSUE SAMPLE PREPARATION

(1) Dust off plant material to remove soil particles. DO NOT WASH.

(2) Remove roots or other foreign material.

(3) Allow samples to air dry at least one day but not more than 2 days before placing in mailing envelope for immediate mailing.

(4) Place sample in a large paper envelope. Do not place plant sample in plastic or polyethylene bags. Mail or deliver this information sheet and plant sample together to the address overleaf.

SOIL SAMPLING:

Take a soil sample, consisting of 5 or more cores, from the same area where the plant samples were collected. For row crops, avoid the fertilizer band by sampling from the middle of the row. Label the soil sample with the same field and sample number as that assigned to the tissue sample and write "PLANT ANALYSIS" on the container. Package corresponding plant and soil samples together and mail to the address at the bottom of the other side of this form. Make certain soil sample bags do not open in transit as spilled soil will contaminate plants.

WHAT THE ANALYSIS REPORT WILL INCLUDE:

For all plant samples the report will show the content of Nitrogen (N), Phosphorus (P), Potassium (K), Calcium (Ca), Magnesium (Mg), Sulfur (S), Zinc (Zn), Manganese (Mn), Boron (B), Copper (Cu), Iron (Fe), Aluminum (Al) and Sodium (Na). The report will also include the results of the soil analysis for pH, organic matter, available Phosphorus (P) and available Potassium (K) and any special tests requested. The results and their interpretation will be mailed to you within 15 days after receipt of the samples at the laboratory.

INSTRUCTIONS FOR COMPLETING PLANT TISSUE QUESTIONNAIRE

FILL IN ONE SHEET FOR EACH FIELD AND CROP. PREPARE CARBON COPY FOR YOUR FILES. SUBMIT ORIGINAL WITH SAMPLE. USE ADDITIONAL SHEETS IF MORE THAN 3 SAMPLES ARE TAKEN FROM ONE FIELD.

1- 3. Give name and complete mailing address.

4. Enter the account number to which the cost of tissue testing is to be charged. The same account number used for soil testing will be used.

Items 5-8 and 11-13 are self-explanatory. Fill in as requested.

9. Describe by indicating either height, number of leaves emerged, silking or tasseling as in corn, flowering stage, milk stage, boot stage, etc.

10. Check visual appearance. If abnormal, indicate percentage of plants in the field affected.

14. For each sample taken from the same crop in the same field, indicate the identification of the sample or samples and the appearance of the samples.

15. All soil samples are analyzed for pH, organic matter, phosphorus and potassium. Check any additional soil tests requested.

16. If soil type is known, enter the name (Fayette, Maimi, Elba, etc.); otherwise, specify texture (sandy, silt loam, muck, clay, etc.).

17-20. Check the appropriate box.

21-22. Indicate what the previous crop was and your estimation of whether the yield of that crop on this field was above average, average or below average when compared to similiar field of the same crop in the immediate fields surrounding this field.

23-25. Check the appropriate box.

26. Check the appropriate box(es) indicating the method of application of N, P_2O_5 and K_2O and indicate the total amount (lbs/a) of actual N, P_2O_5 and K_2O applied.

27-28. Check the appropriate boxes if any of these nutrients were applied.

Tentative standards for leaf analysis were prepared by Dr. M. N. Dana and provided to participants at the Cranberry School over the past several years. If you didn't receive this or need another copy, please contact me at the address given below. If you have specific questions on the analysis results, please contact Dr. Lloyd Peterson (608-262-1879) or me at 608-262-1268.

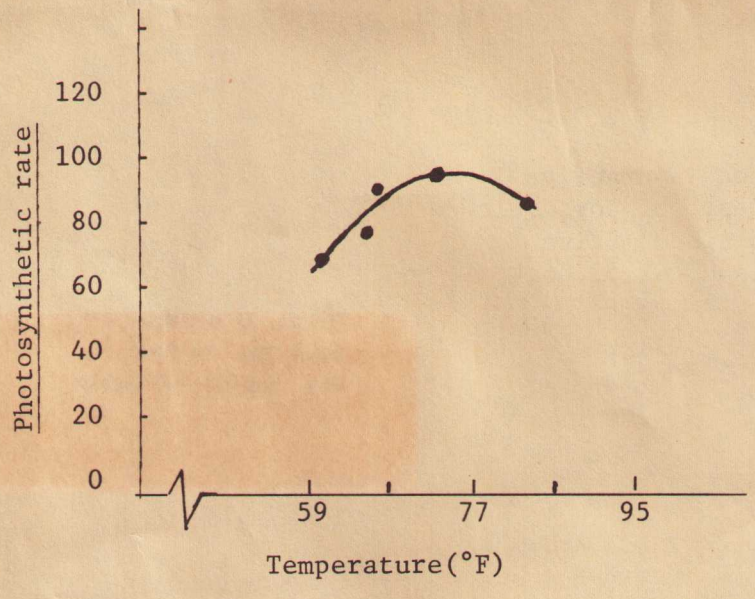
MAKING A CASE FOR "AIR CONDITIONING" (CROP COOLING)

Recent high temperatures for an extended period again raise the question, what happens to plants under these conditions? Cranberries, like other higher plants depend on photosynthesis as the very basic process whereby light energy is converted to chemical energy for growth, flowering and fruiting. In photosynthesis, carbon dioxide and water in the presence of light energy is converted to carbohydrate (sugars) and water and oxygen are given off into the air. The sugar (glucose) is the basic building block for growth and fruiting of the plant.

Some basic factors which determine the rate of photosynthesis include of course the presence of carbon dioxide, water, adequate light, and temperature. In general, photosynthesis increases with temperature in plants until an optimum is reached. Beyond that temperature, the photosynthetic rate levels off or begins to decline, largely because the plants transpiration (water loss) exceeds the capacity of the plant roots to restore moisture. Temporarily, water can be moved from the fruit to the leaves increasing water stress and slowing the growth rate, especially under conditions of low relative humidity. In effect the "factory" slows down substantially.

Although effects of extended high temperatures on photosynthesis and ultimately, growth and yield in cranberry have not been thoroughly researched, work on other crops has shown that temperature modification by plant cooling with irrigation can have dramatic beneficial effects. Several decades ago, Dr. R. L. Carolus, Michigan State University and others demonstrated that plant cooling by mist irrigation at temperatures above 80°F and relative humidity below 70% increased marketable yield in tomatoes by 31 to 50%, 33% in muskmelon and 70% in cucumbers.

Several years ago, Dr. Jerry Edwards and I did a brief experiment to assess the effects of temperature on photosynthesis in 'Searles' cranberry. A simple graph of the results is shown at right.



As noted, photosynthetic rate, measured by carbon dioxide use, reached a peak at about 73°F and began to decline measurably at 81°F. The results of

course could vary depending on light intensity, oxygen and carbon dioxide levels or other factors. At any given level of these factors however it appears that photosynthesis may be suppressed at high temperatures.

The bottom line? Dr. M. N. Dana has often noted the beneficial effects of frequent, light irrigation on the establishment of new plantings. Cranberry growers have repeatedly demonstrated the effectiveness of this practice on rapid vining over of new beds in summer.

On bearing beds, at temperatures exceeding 80°F and low relative humidity, plant cooling by intermittent irrigation would seem to provide a beneficial effect, and is in fact practiced by some growers. Although adequate guidelines are not established, application of just enough water to thoroughly wet leaves at 3 to 4 hour intervals (one might refer to this as the "Dr. Pepper timing," at 10, 2 and 4) might be appropriate under prolonged periods of high temperature stress. A caution - with frequent wetting of foliage and fruit, attention to adequate disease control would be essential!

SMILE . . . .

From Murphy's Laws: In any bureaucracy, paperwork increases as you spend more and more time reporting and as a result, doing less and less. Stability is achieved when you spend all of your time reporting on the nothing you are doing.

Prepared by:

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