PLANT ANALYSIS

How can you tell if the fertility in your marsh is adequate or if addition of fertilizer is warranted? One of the best techniques is through plant analysis. Plant analysis provides a "snapshot" view at the nutrient content of particular diagnostic tissues that can be interpreted for the crop. Growers should remember, however, that mineral nutrients are only one potential limiting factor. Yields can also be limited by soil moisture, temperatures, shading, cloudy weather, weed competition or herbicide injury.

There are three essential point in collecting samples for plant analysis:

1. **Sample at the right time**
2. **Sample the right plant part**
3. **Take a representative sample**

Timing. **NOW** is the correct time to collect cranberry tissue samples for plant analysis. During August the concentrations of most important nutrients are stable in cranberry uprights. This allows a fairly broad window within which samples can be taken without timing affecting the results. If samples are taken too early or too late the sampling date may unduly affect the tissue concentration of some elements. Further, in order for comparisons to be made with University standards the samples and standards must be taken at about the same time.

Plant part. The correct plant part to collect for a plant analysis is new upright growth that was produced this year. You don't need to separate fruiting and nonfruiting uprights, but you should remove any fruit from the samples. If you collect both current season growth and one-year-old growth your samples may show a deficiency even though concentrations are adequate in new growth since concentrations are lower on one-year-old growth.

Representative sample. Since only a few handfuls of uprights are taken from a bed for later analysis, it is critical that the few uprights collected are representative of the millions of uprights per bed. A representative sample cannot be taken from one corner or even along one edge of a bed. Start in one corner and walk towards the opposite corner collecting 4 or 5 samples along the way. Better yet, walk in a zigzag pattern across each bed. Don't sample from overly vigorous nor poor unthrifty vines.

Once the sample has been collected, prepare it for shipment to the lab. Remove any soil, etc. from the uprights, but **DO NOT WASH** the uprights. Washing may leach out soluble nutrients and will give a false analysis. Place the sample in a paper bag or large envelope. If you are going to mail your sample, allow the uprights to air dry overnight to discourage molding during shipment. Don't use plastic or cellophane bags. You can also deliver samples to your count Extension office for shipment to the University lab.

In a week to 10 days you should get a report back from the lab with an interpretation telling you if the concentration was deficient, low, sufficient, high or excessive. Use this information to gauge the effectiveness of your current fertility program and to plan your fertilizer program for 1994.

While it costs $15.00 per plant analysis sample, eliminating a single fertilizer application per year will more than pay for the cost of the analysis, not to mention keeping additional fertilizers out of the environment.

Teryl Roper, UW-Extension Horticulturist

I wonder if ever you change human beings with arguments alone: either by peppering them with little sharp facts or by blowing them up with great guns of truth. You scare 'em, but do you change 'em?

David Grayson

PLANT ANALYSIS-- an essential nutrient management tool!

Most farmers view plant analysis as a diagnostic technique useful for identifying a nutrient insufficiency. They fail to recognize its most significant aspect--a means of assuring nutrient sufficiency for any soil/crop management system.

However, plant analysis is not new. Tree-fruit growers have been using plant analysis for many years as a means of determining fertilizer needs. A technique known as "crop logging" has been successfully used in the production of sugar cane. In addition, petiole analysis has a fairly substantial history for the monitoring of the nutrient-element status in the production of grapes and sugar beets.

Plant analysis has been used to a considerable degree in the production of some vegetables, primarily tomato. The application of plant analysis to field crops such as corn, soybeans, small grains, pasture crops, etc. has been little used other than for diagnostic purposes when a nutrient insufficiency is suspected.

Farmers who follow a carefully drafted nutrient management plan find that plant analysis answers their question regarding sufficiency--that is, "was the soil fertility level plus added fertilizer sufficient to satisfy the crop requirement for all the essential elements, major ones plus micronutrients?"

In summary, plant analysis can be viewed as the ultimate test for determining nutrient sufficiency as the plant itself serves as the integrator of all factors that influence crop growth and yield.

At the 1959 Plant Analysis and Fertilizer Problems Colloquium, questions were raised regarding plant analysis as to the reliability of interpretive data, the utilization of ratio and balance concepts, hybrid influences, and changing physiological processes occurring at varying elemental concentrations in the plant. Much progress has been made since that time, and today a plant analysis can be reliably applied to most soil/crop situations for solving diagnostic problems as well as for nutrient monitoring. In addition, significant advances have been made in the laboratory analysis of plant tissue and there is interpretation information available for a wide range of crops.

Laboratory Analysis

The reliability of analytical results obtained from most plant analysis laboratories is probably unquestionable as the techniques and requirements for analysis have been well established. Most laboratories are using multi-element analyzers, like the inductively coupled plasma emission spectrometer (frequently referred by its acronym ICP) for the determination of the mineral elements, and automated N and S analyzers for these two essential elements. The only questionable element is iron, mainly due to problems associated with its unique plant chemistry, and the potential of contamination from dust that readily adheres to plant tissue.

Interpretation

Interpretation of a plant analysis result is still very much a skill that comes from experience, although there are various well-established methods for making interpretations. Initially, and particularly for use with fruit crops, "standard values" were used for comparison with unknowns. A standard value was the mean concentration generated from many analyses of leaves taken from normal growing and producing trees. In addition, "critical values" were developed for many major crops, values that are still in use today for interpretation. Both standard and critical values are single point concentrations, the interpretations being that an element concentration for an unknown below either value would be considered deficient.

The more commonly used interpretation today is based on "sufficiency range values" obtained from the relationship between element concentration and plant growth/yield.

With the demand for high efficiency in the use of fertilizers and other nutrient supplying

materials, it is becoming essential to continuously monitor the soil and crop to determine their nutrient status. For most perennial crops, plant analysis is the primary basis for fertilizer recommendations. For annual crops, plant analysis provides a means for identifying nutrient sufficiency. Therefore, plant analysis use has developed beyond its role as just a diagnostic tool of confirming nutrient-element insufficiencies to an essential management tool to ensure that the proper soil/crop nutrient condition exists and is being maintained.

*Summarized from **Solutions**, March/April 1993*

FERTILIZER DEFINITIONS

Grade. Minimum guarantee of the percentage of total nitrogen, available phosphoric acid and water-soluble potash in fertilizer. Wisconsin law has a minimum guarantee of 24 units of nutrient in order for a product to be called fertilizer.

Example:	6-24-24
total N=	6 lbs N/100 lbs material
available P_2O_5=	24 lbs P_2O_5/ 100 lbs
water sol. K_2O=	24 lbs K_2O/100 lbs

Ratio. Grade reduced to its simples terms. Putting the grade in its simples terms allows easy comparison between different grades.

Example: 6-24-24 has a ratio of 1-4-4

Carrier. Material in which a given plant nutrient is supplied.

Example: ammonium nitrate and urea are carriers that supply N.

Unit. Means 1% of 1 ton or 20 pounds. On a ton basis, the units per ton are equal to the pounds of nutrient per 100 lbs material.

Example: urea contains 45% N or 45 lbs N/100 lbs material or 45 units in a ton.

Primary Nutrient. Refers to N, P, and K. These nutrients are used in considerable quantities by crops. Optimum crop production usually requires supplementation with these nutrients.

Secondary nutrient. Refers to Ca, Mg, and S. These are used in moderate quantities by; crops. They are usually contained in other primary nutrient products and ag limestone.

Micronutrient, trace or minor element. Refers to essential plant nutrients used in relatively small amounts. Most soils supply adequate amounts of trace elements for most crops.

Sherry Combs, UW-Extension Soil Specialist

TIME LINES AND THE CALENDAR OF EVENTS

In comparing 1993 and 1994 time-lines and the calendar of events, many of us are at least two weeks ahead of last year. Early bud development started mid-July, and our fruit has been blushing for some time now. The fruit size is what it was at harvest time last year! Receiving stations: Be ready for a healthy crabapple sized harvest!

FLIGHT GRAPHING

Our flight graphs have been colorful this year. These indicators have been very useful in predicting 2nd generation. Unfortunately, the Blackheaded fireworm flights are climbing again. This may indicate a third generation of this pest. in “hot spots” we are already finding BHFW eggs. Keep in mind that most of these will over-winter, but it is my belief that because of this early egg laying period, we may very well see some hatch. We are pleased to report that the cranberry fruitworm experimental lure has proven itself to us again. It is ideal to be able to distinguish between the sparganothis and cranberry fruitworm flight. I value the insight that this generation of flight activity gives us for next years’ potential problems.

CRANBERRY FLEA BEETLE

Even the flea beetles have arrived early. We have seen the adults working on the weeds on several marshes the week of July 12th. These adults are 1/8 to 1/4 inch in length, they are shiny black with reddish heads. When placed in the hand the beetles actually jump and can readily fly. The adults feed on both upper and lower leaf surfaces in a skeletonizing manner. Feeding on some epidermal layers of the leaf causes the leaf to turn brown, and may result in upright die-back. The beetles lay their eggs in the soil. The eggs are pale yellow, irregularly shaped, about 3/4 mm long. They over-winter in this egg stage. In the spring larvae are very difficult to find because they are very tiny. They are creamy white in color with a brownish head. A fleshy projection or "tubercle" extends from the back end. High larval infestations result in girdled roots and vine death, similar to the damage caused by cranberry girdler. The pest is easily controlled in the adult stage.

WHAT HAS BEEN HAPPENING IN THE LADY BUG REGION?

During the season we have had some new intruders challenge us. One such critter we found 1 to 2 inches down in the soil. Dr. Dan Mahr has identified it as the black cutworm. Dr. Mahr shares that it is interesting in that it does not survive Wisconsin winters and repopulates each year from the South. The black cutworm prefers tall grass and herbaceous vegetation, so it is unusual to find it in cranberry. He indicated that it has more than one generation, thus we are presently monitoring its flight.

Another cutworm species had been attacking cranberry blossoms. The problem was that we could not find it readily in our sweeps, but the damage was easily seen from the dike. Upon further investigation we discovered it on the bed floor in the trash layer. It is a nocturnal feeder, so I guess this means that we'll be "Moon Scouting" next season!!!

We are pleased to share that 96 gypsy moth traps have been in place since the first week of July. It is my belief that it is advantageous for us to know first hand if our forests are infested. This will give us a "head-start" in strategically planning our defense. Thus far we have found no activity in any of the locations.

We commend those growers who are willing to try different means of control on the pest tipworm. Early spring with the onset of the first generation of tipworm we had a grower that tried flooding as a control. Keep in mind that this first activity was flight and some first instar larvae. The female flight in our 20 sweeps was a high count of 27. Flooding in this case stopped the flight. This adult is "wimpy", she had no place to land, thus didn't have a location to lay eggs or rest awhile. As a result, we assume she died. When we came back to the same location we found nothing. Another grower tried this means of control for the third generation. At this time of the year we had overlap. Adults, 1st, 2nd, 3rd and pupated tipworm were easily found. In testing the area after the flood we found no adults, no 1st instar, but 2nd, 3rd instar and pupated tipworm were readily found. Flooding at this time of the year was not as beneficial as for the first generation because of the overlap. *(It is also more dangerous to flood vines later in the season.)* The larvae that had been 1st instar prior to the flood were probably 2nd instar already. However, because we controlled the adults, there were no first instar. Keep in mind that in doing such a study, the crop was set back, but presently it has caught up. In the second study, fruit set was injured, and there will not be a recovery of that kind of set back. Always experiment on a small scale, one bed at a time.

Jayne Sojka, Lady Bug IPM

You never stub your toe standing still. The faster you go, the more chance there is of stubbing your toe, but the more chance you have of getting somewhere.

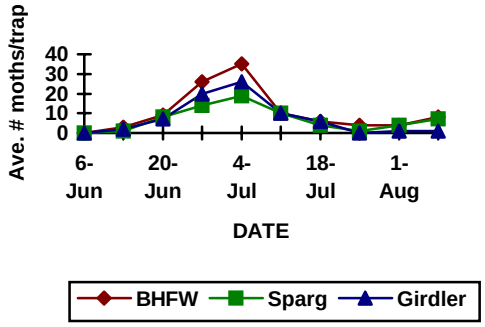
Charles F. Kettering

1994 Pheromone trap counts

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

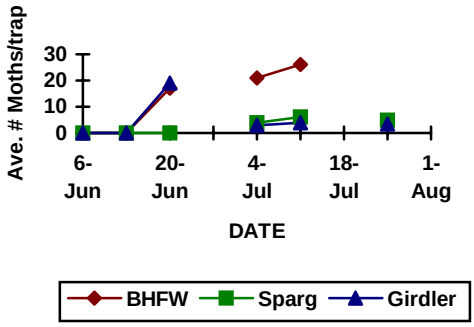
Please note that different regions may have different scales on the left axis. Doing this allows greater accuracy in determining actual values within a region. However, comparisons between regions are more difficult. Please use caution in making comparisons of these averages to trap counts on your marsh.

Northwest Area



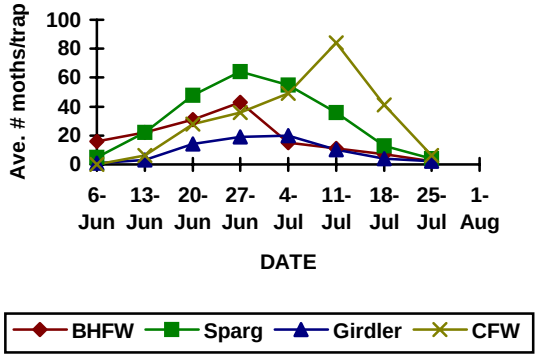
Means from 8 growers

Northeast Area



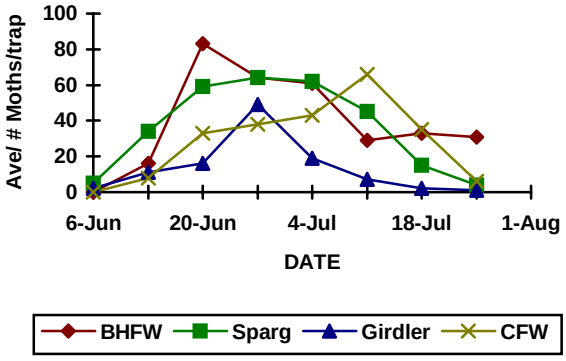
Means from 2 growers

Warrens Area



Means from 39 growers

Cranmoor Area



Means from 29 growers

1994 Cranberry Field Day

The 1994 Cranberry Field Day will be held on Wednesday August 10 at Brockman's Owl Creek Marsh on highway 80 north of Dexterville. Activities planned for the day include marsh tours, exhibits and the summer business meeting of the Wisconsin State Cranberry Growers Association. This is a wonderful time for growers to visit with suppliers and each other to get "up-to-date" on what's new. Lunch tickets are available, but should be purchased by August 8 so an appropriate number of lunches can be prepared.

Parking for the field day will be at Lake Dexter Park. Shuttle buses will take people to the marsh directly across highway 80 to the east. WSCGA asks that all use the buses to protect the safety of attendees and the general public.

Wisconsin Cranberry IPM Newsletter
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