



NITROGEN AND THE STRAWBERRY

Research has shown that Nitrogen is one of the most critical nutrients in Strawberry production. Using routine plant analysis to determine the nutritional status plus the in field Nitrogen test helps us maintain adequate N levels from planting, over wintering, during spring growth, blooming, fruit development, ripening, harvest and on into dormancy. It has been concluded that the earlier in the growing season that a nitrogen deficiency occurs, and the longer it lasts, the greater is the loss of harvestable fruit.

Over fertilization of Nitrogen however can be detrimental. Often a grower will apply Nitrogen as cheap insurance and this may only create quality problems and in some cases promote excessive leaf growth that depresses yields.

The critical level of 500 ppm of Nitrate in the petiole of young mature leaves has been established as the point at which rates of growth and fruit production

start to decrease. However Nitrate values well above 500 ppm do not necessarily increase yield. Moderately high values Nitrates are referred to as safe reserves and can be used by the plant at a later time for best fruit production. Excessive values of Nitrates will however reduce yields. Sufficient levels of 500 – 1500 ppm of Nitrates or greater than 2.9% total Nitrogen are required by the plant during rapid growth, vegetative growth, blooming, and fruit set.

In conclusion therefore we must understand that Petiole N levels must be in the 1,000's during these times and not allowed to drop below or even get close to the critical value of 500 ppm. It is therefore critical to be able to respond immediately if Nitrate levels drop below this critical level. If during these high N demand times, Nitrate levels drop below this point we must apply Nitrogen as soon as possible to avoid fruit loss. Use of the field kit allows us to monitor this closer and not overdo Nitrogen application.

This critical level does not differ with variety of strawberry. Variety does however, play a role in demand for Nitrogen. Some varieties will forage for Nitrogen better than others and therefore, not require as much nitrogen to be applied to maintain the optimum levels. Some varieties will start to grow earlier and need more than others and will require available Nitrogen much earlier than others. Therefore since these critical levels that we have

established for strawberries change very little from year to year or variety to variety; we can determine the nitrogen status of the strawberry plant anytime during the growing season and apply fertilizer accordingly.

Soil levels of Nitrogen and the soils ability to contribute N to the crop will vary depending on mineral content and organic matter. Amount of rainfall and/or irrigation and water movement through the soil will also have an affect on Nitrogen carryover and soil contribution.

Application of Manure for a nitrogen source is not always beneficial because we cannot control the time of release of the nitrogen. Tests shown in trials where 10 tons of manure per acre were applied contributing over 220 pounds total Nitrogen was not as effective as 150 pounds of Nitrogen from a soluble fertilizer applied at more precise demand times. Manure does however contribute to the long-term fertility of the soil and build organic matter, which is very beneficial. We should give credit to the Nitrogen from manure but also be prepared to add additional N at critical times if required.

On new plantings where we remove the blossoms we must be very careful of reducing petiole N levels. Unlike most crops where there is a smaller fruit load, it lowers the plants needs for nutrient, This is not true for the Nitrogen needs of Strawberry. Removing the blossoms greatly increases leaf growth, and this causes a large decrease in petiole nitrate N, therefore indicating a need for more N; again illustrating another critical time we must monitor N levels in the strawberry.

Disease and insect damage will reduce plant growth and also the strawberries need for Nitrogen. Therefore, if we are to benefit from the full effect of Nitrogen application, disease and insect control are a must.

In summary, the only time we can allow N levels to drop in a strawberry crop is just after harvest during renovation and in late fall as the crop goes into dormancy. More complete plant analysis and the use of in field kits will give us a better control of N application.

A&L Canada can turn around a tissue analysis in 24 hours after we receive the tissue. Take a sample in the morning to monitor N, and courier it to the Laboratory. We will fax the results to you within 24 hours. Make sure you include your fax number on the submission sheet.

The nitrogen kit that I refer to is the one that I make at the lab and can be picked up from A&L Canada at 2136 Jetstream Rd., London for a nominal fee. We can not ship or mail these kits because they contain sulfuric acid.

These kits are accurate and easy to use. I have not calibrated a cardy to these kits but maybe this season I will have better data.



Nitrogen management

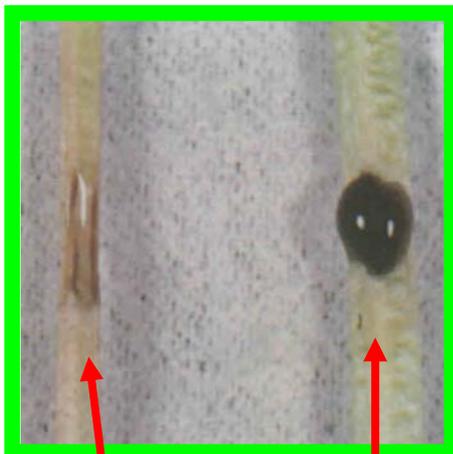


Nitrogen Deficient Leaf

When using this kit if the petiole turns blue, then you have an adequate level of N. If it turns blue slowly you are close to the critical level. If it remains clear and then it gradually turns dark or brown, then you are at the critical level. If it turns brown quickly your crop is deficient of N and you may never catch up.



Nitrogen Deficient calyx



Deficient

Sufficient

As the strawberry begins to produce flowers the demand for N increases quickly.

Begin to monitor Nitrogen as soon as the flower trusses begin to extend. With some varieties such as V-star or Earliglow, if you get behind you will never catch up.

If the Nitrogen levels drop below the critical level at this time, berry size will

drop very quickly and the plant will not send out anymore flower trusses.

Low nitrogen levels at this time with a heavy crop will drain reserves from the crown and may lead to severe crown damage or collapse.

If the Nitrogen kit or your tissue analysis indicates that you are running short of N, an application of 5 pounds of Urea per acre through the irrigation as a foliar will bring up levels.

In season it is not uncommon to be applying an N treatment every 4 days.

With this type of aggressive Nitrogen application disease and fruit quality can be a problem. Alternating Nitrogen applications with a Calcium treatment keeps disease in check and increases fruit firmness.

An example of this program would be if you apply 5 pounds of urea on Monday and then on Wednesday apply 4 pounds per acre of Calcium Chloride through the irrigation as a foliar. What I mean by as a foliar is that you put the Calcium Chloride on at the end of the irrigation so that it remains on the leaf and is not washed off.

If not applying it through the irrigation than apply with 30 – 40 gals of water with the sprayer at 1 gram per gallon of water.

This program has been effective and is inexpensive.

Calendar of Nitrogen Management on Strawberry

