

Crop Information

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Starting an Orchard

Orchard management today has become a very complex business with the advent of new pesticides, rootstocks and storage systems. However, we have generally forgotten some of the basics in fruit production. Plant nutrition still plays a major role in disease resistance, pest resistance, yield and more importantly of late the quality of the finished product.

Planning a new orchard should start with a soil survey of the field to be planted into an orchard. This will give a reading of where the nutrient levels are, and allow you to develop a program to bring levels to ideal prior to orchard establishment. This may include the use of a cover crop for a few years prior to establishment to allow the grower to build fertility levels. If done this way it is much easier to maintain a nutrient balance in the future.

Soil tilth and nutrient balance not only increase your chances for establishment, it also plays a major role in longevity of the orchard. Good nutrient levels should be established before planting to ensure optimum growth and quality. Some nutrients are difficult to place in the root zone after the orchard is established, for example Phosphorus that doesn't move readily in the soil and is more difficult to build in the root zone after establishment.

Phosphorus is perhaps the most overlooked nutrient in orchard production today primarily because it is so difficult to work into the soil after establishment. However, Phosphorus plays a major role in root development, fruit colour, and yield and quality that often we don't relate to Phosphorus.

Established orchards are more difficult to work with when trying to balance the nutrient status because of placement of some of the nutrients, However, a grower still requires an up to date reliable soil survey to begin and correct nutrient imbalances. This survey may include both top soil and sub soil tests depending on the age of the orchard.

In Ontario, orchards that I have worked with that have major disease, and or production problems usually show up as having an imbalance of nutrients or pH problem when the soil was tested. Depending on age and severity of disease most of these problems can be resolved with proper nutrient management.

A soil survey should include all the essential elements, organic matter, pH, and most importantly C.E.C. and percent saturation of K, Mg, and Ca. The balance between these cations is most critical in fruit production when trying to achieve the quality we require.

After the orchard is established, a maintenance fertility program ensures that all elements will be available during critical time. Weather conditions affect soil properties during the season and some elements may become tied up and unavailable to the plant. A balance of nutrients and proper placement will lessen the problem. In addition, a grower must also continue a tissue-monitoring program to make sure all of these critical levels are met during the season.

Although some people don't believe that a soil test is beneficial in orchard management, I find that it completes the picture when trying to develop a complete fertility program using a tissue test. For best results, I would recommend the use of a soil test as a base, along with a yearly timely tissue and fruit analysis to complete the job.

Nutrient Management During The Season

A general practice in fruit production has been to apply all of the nutrient requirements in the spring based on last season tissue analysis. Last season tissue tests do help design a program for the next season but are not as accurate as in season monitoring. Tissue tests done at certain growing stages help us to correct in season problems before they affect yield and quality.

An example of this would be elements such as Boron and Zinc that may not be readily available in some cold spring soils but are required in early stages of growth more than later.

A late season tissue test might indicate an adequate level but doesn't necessarily suggest that levels were adequate when required.

In past seasons I noticed N and P were a limiting factor in early season because of the dry weather, which in most cases went undetected. Early season tissue analysis would allow us to treat the problem before it created yield and quality problems.

Increased application of soil applied N and P was not the answer because it was not available, but a foliar program would have corrected this temporary problem.

Application of all of our N to the soil in the spring before we know how big the crop is can sometimes cause problems such as quality or increased pre harvest drop. Applying N in split applications in the spring will avoid this using a tissue analysis to help bring N levels to ideal.

The general program that we have been working with is, that instead of an all in one fertilizer application we have adopted a spoon-feed program. Using tissue and fruit analysis to monitor the crop throughout the season we are developing programs to spoon feed the crop nutrients depending on variety and region.

Fruit Analysis

Combining soil and tissue analysis helps to develop an ideal fertility program to better our yield and quality and overcome some environmental interactions from season to season.

Fruit analysis takes this one step further by analyzing the quality of the fruit in season. An early season test is done so that we can treat problems before harvest and a pre harvest test is done to determine which fruit can be stored and which should go to the market first.

Although this is not an answer to all of our problems it will become another tool such as tissue and soil analysis to help the grower make valuable management decisions.

At the present time critical levels have been developed all across Canada and across varieties and in most cases support work that has been done in other countries.

All of this may sound complex and management intensive, however once perfected and put into place an orchard manager will rely on this to ensure top production and quality. We must keep in mind that Soil, Tissue and Fruit analysis are only management tools and at no time solve all the problems that a grower is faced with in a production year.