



The Berry Patch is a newsletter that focuses on small fruit Strawberries, Raspberries, Blueberries etc., however all of you must grow other crops and if there is an interest in other cropping information such as pumkin, asparagus please drop us a note on aginfo@al-labs-can.com and we will include some of this information in our newsletters.

Water Management of Small Fruit in Season

Water Management in small fruit is important throughout the season and these changes in amount required depending on the temperature and wind. The use of an irrometer will take the guess work out of water management.

I would recommend that you place these at 6 inch and 12 inch depths. These units often times loose their calibration and can be misleading so be aware that they could be wrong. It is good to have more than one set on the farm as a double check in case one loses its calibration.

Although we want to keep the strawberry root dry and away from standing water, it is also important that they get at least $\frac{3}{4}$ of an inch at this stage and when they are in harvest we will need an inch to an inch and a half weekly.

If you are using an irrometer you should irrigate $\frac{1}{4}$ of an inch when the irrometer gets to 25. It is important that we do not apply more than $\frac{1}{4}$ to $\frac{1}{3}$ of an inch at a time and irrigate more frequently if required. Growers on very course textured soils may require watering at $\frac{1}{3}$ to $\frac{1}{2}$ of an inch each time to keep field levels in the proper range. Again irrometers will help with this water management.

In hot dry seasons it may be required to water 1 to 1 $\frac{1}{2}$ inches per week to keep up to the water demand. Again the use of irrometers will help in this decision process.

Another good indicator of adequate watering is the slug. If we do not need to use slug bait in a season then we likely did not water enough.

One mistake that I see often in my travels is that growers often neglect the crop after renovation. Water Management is just as important in July, August and September as it is in May and June.

New plantings of strawberries require water as much as established plantings. This water management applies to them

just as much. In the newsletter on New plantings I recommend that they are watered immediately after planting each and every day. The new plantings will require 1 inch of water each week throughout the season

Raspberries also require this amount of water in season to keep them productive. There are mixed reviews in the literature for water requirements on raspberries some suggesting that it doesn't pay and others suggesting that it does. My experience is that it is very important for not just that crop but the health of the cane and production of fruit for the following season and the overall long term health of the raspberry patch.

Raspberry cane suffers from extreme wind damage in both winter and summer. Raspberries planted next to a wind break of some kind will always produce better and have less winter injury. The main reason for this is that the raspberry is even more sensitive to warm desiccating winds in the summer than it is to the winter winds. Some of this injury can be reduced with proper water management. This type of economical loss is difficult to calculate if you are basing water economics on the crop in that season. I think that this is why there is conflicting information on the practicality of irrigation on Raspberry.

Blueberries are another crop that require good water management. Again because the blueberry is a long term commitment it is cheap insurance for future years production.

The blueberry crop also has a very poor root system and is usually a very shallow

root, therefore its ability to forage for water is even poorer than a raspberry.

When establishing a blueberry crop one of the biggest mistakes that I have seen is that drip irrigation systems are placed too deep. Continuous years of growth and mulching the crop will push the drip system lower as we train the blueberry root system to grow up with the mulch.

Evaporative Cooling

A question I often get from growers that are looking to expand their operation or a new grower, is what is the most practical method of supplying water. Although drip irrigation systems use less water, in the case of strawberries and raspberries I would prefer overhead systems. In blueberries I would tend to go with a drip system.

The reason for this is that in strawberries and raspberries I will recommend application of nutrients by irrigation which is a much more efficient system as far as timely application than if we always had to rely on the sprayer.

Irrigation should also be to control the temperature in the strawberry field. If the canopy temperature reaches 85 degrees F or above it is important to turn on the irrigation to lower the canopy temperatures. If let go the strawberry will go into stress and begin to shut down. This program alone can lengthen your picking season and increase the quality of your fruit by maintaining size.

Irrigation should be cycled so that evapo-cooling is taking place somewhere in the field if temperatures are at extremes. This will increase the productivity of the strawberry and

reduce the amount of fruit scald in these extreme conditions.

Water required for evapo-cooling should not be considered as part of the weekly water requirement. This application is usually done in small quantities during times of the day when evaporation is extreme.

Irrigation should be done in the morning not at night and, if using irrigation for frost protection, it is important that we cycle this application so as not to overdo the water standing in the field.

It is important before starting the irrigation program that we make sure that all the surface drainage is operational and clear of debris. At no time should there be standing water in the field for any length of time.

In the spring we have a tendency to not water enough and the berries can dry out. Make sure that they are getting at least $\frac{3}{4}$ of an inch weekly.

It is often said by strawberry growers that I visit, that in years when we do a lot of frost protecting we have the best crops. This is due to the fact that the strawberry crop is receiving enough water.

Evapo-transpiration where water supply in the soil and to the crop is not limiting may range up to 0.60 inches or more per day depending on sunlight, and air temperature, humidity and wind velocity. When the ability of the soil to supply the water required to meet the demands of the net solar radiation heating a leaf canopy cannot be met, then water is first translocated to the leaves and other actively transpiring

tissue. Those of lower osmotic value ie. developing buds, flowers, fruits etc., supply the deficiency. With continuing water stress the stomates close, photosynthesis stops, plant tissue temperatures increase, and the leaf or certain areas become desiccated and finally necrotic under prolonged stress.

These phenomena are a frequent occurrence during late spring and summer in areas where ambient air temperatures rise above 85 degree F at relative humidity below 50%, and if they occur during some critical stage in crop development may result in reduced productivity and quality. This situation may even occur when the soils moisture is maintained near field capacity under extreme water stress conditions.

The application of water to the crop canopy during the peak periods of incoming radiation (10 a.m. to 3 p.m.) at the rate of .03 to .05 inches per hour will help alleviate the plant's water stress by reducing its transpiration through an increase in the relative humidity of the ambient atmosphere.

The change in phase of the irrigation water from liquid to vapour on the leaf surfaces will reduce leaf temperature and further reduce plant water stress. In humid areas a few days to a few weeks of this practice will generally be adequate to insure seedling emergence, pollination or initial fruit development during a period of temporary water stress.

In fields that have lower Potassium levels (levels less than 3% saturation) water stress becomes even more apparent. If during periods of the day when heat is at extremes and you notice

the strawberry leaf turning over, more undersides of the leaves turned up, the crop is under stress. Fields that I have visited that exhibit this condition after the water is turned on you can visually see the leaves roll back.

Often growers will ask "How can I accomplish this evapo-cooling when I have pickers in the field?" The answer to this is that evapo-cooling does not take the entire irrigation system running. Turning on a lateral in a field will effectively cool the entire field.

If managed properly, and fields are set up properly, throughout the day a grower will be able to rotate the laterals and maintain the cooling effect without using a lot of water and still having access to the field.

Another benefit from this program is that in a U-Pick operation your customers enjoy the cooling effect themselves while they are in the field. In a couple of cases where a producer was evapo-cooling an area they have had pickers actually go under the irrigation system to pick because it was refreshing.

Evapo-cooling is effective and if planned out can extend your season and improve the overall health of your crop.