

EBSN & BSN

What can be done?

EBSN can occur from when the inflorescence is 2cm long and may result in severe loss of yield. Stressed vines release ammonia, which is converted to ethylene, which is generally a plant growth hormone, but during this stage of development it stimulates the shedding of flowers. Vines experiencing nutritional, water and carbohydrate stress may shed flowers before fruit set in this way.

Bunch Stem Necrosis however can occur also during ripening of the grapes. Vines which are severely stressed, in very wet and cold conditions and very hot and dry conditions (environmental extremes) as well as nutritional stress may result in BSN.

This disorder has a severe impact in certain viticulture regions in New Zealand. Environmental conditions are difficult to have control over, water and draught stress may be controlled via irrigation and it has long been the belief of some consultants that proper Balanced Nutrition plays an important role in alleviating the disorder.

Roots Shoots & Fruits Ltd. in conjunction with a leading corporate studied the impact of balanced nutrition on a block of BSN affected grapes in the Hawkes Bay Region over two seasons. The first season looked at whether a foliar Potassium fertilizer K-Forte (0-5-20) had any detrimental effect on BSN and the second year looked at a nutritional balanced fertilizer program on the affects of BSN. The results for these two trials are documented below.



2003-2004 Cabernet Sauvignon

The concept of applying a foliar Potassium spray to vineyards in an effort to increase Brix and colour has been looked at with much scepticism over the last couple of seasons, particularly on soils that are already high in Potassium. Historically, the wine makers perspective on the application of potassium both foliar or as a soil application has definitely been discouraged. There has also been scepticism with regards to how the use of K-Forte 0-5-20 as a foliar application would affect bunch stem necrosis incidence in wine grapes.

In the 2003-2004 growing season, a Cabernet Sauvignon block renowned for being affected by the high incidence of BSN was treated with K-Forte® as a foliar spray and assessed to see if there would be any impact on BSN. The grower's regular nutrient regime was followed on the control and treated blocks with the addition of K-Forte applied @ 6 L / ha to only the treated areas. This application was done twice, once at veraison and the second application being 2 weeks before estimated harvest.

Bunch Stem Necrosis (BSN) was observed during the ripening stages of this crop and an evaluation of BSN was taken at harvest. Using a typical incidence and severity module, 5 full bays of fruit at regular intervals were chosen both within treated and control blocks to give replication to the BSN incidence and severity data. All bunches within those bays were individually evaluated to determine the level of BSN and given a rating as a percentage. The total

infection percentage was then calculated showing that K-Forte treated areas had 20.81% less infection than the control, thus dispelling the myth that foliar applications of K-Forte will further increase the incidence of Bunch Stem Necrosis.

RESULTS

BSN Total Infection % Percentage

BAY NO.	K Forte	Control
Bay 3	21.1	24.9
Bay 6	20.1	14.3
Bay 9	11.6	31.4
Bay 12	21	12.4
Bay 15	12.2	25.6
Average	17.2	21.72

The difference between the K-Forte treated block and the Control block was a 20.81% reduction in the incidence of Bunch stem necrosis where K-Forte was applied versus where K-Forte was not applied.

2004-2005 Cabernet

2004 – 2005 has seen further work carried out with nutrition on the incidence and impact of Bunch Stem Necrosis.

A block of Cabernet, renowned for the severity of bunch stem necrosis observed in this block was chosen. Soil structure, plant age, root stock, orientation, vine spacings were all consistent over the whole area. The block was then divided into treated and control areas, all of which had 6 replicates of each. Nutrient levels were assessed prior to flowering via leaf analysis and from that information a balanced nutrient program was designed and implemented for the treated blocks. The control block consisted of the growers' normal fertiliser regime. All vineyard management practices were the same across treated and control areas. Prior to harvest the trial and control blocks were assessed for total infection, incidence and severity data for Bunch Stem Necrosis.

RESULTS

Control	Total Infection %	Incidence %	Severity %
1	27.8	54.7	50.8
2	20.7	51.2	40.5
3	11.5	30.8	37.5
4	21.8	53.2	40.9
5	12.3	38.2	32.1
6	19.4	50.05	38.5
Ave	18.92%	46.36%	40.05%

Treated	Total Infection %	Incidence %	Severity %
1	16.3	39.4	41.3

2	8.5	25.1	34.0
3	11.8	32.0	36.9
4	12.8	30.3	42.1
5	12.4	35.8	34.6
6	9.3	24.7	37.5
Ave	11.85%	31.22%	37.73%

From the data obtained, it is clear that using a balanced nutrient program incorporating high quality products at critical stages throughout the season was able to attain the following results and alleviate the nutritional stresses which can induce BSN:-

The Incidence of BSN was reduced by 32.66%.

Severity was reduced by 5.79%

Overall total infection reduced by 37.37 %.

There was a significant difference in the results and overall, the quality of the crop was positively improved.

Targeted applications of particular elements may be looked at for further work into alleviating the incidence of Bunch Stem Necrosis in the Hawkes Bay region and further work will be conducted in the 2005 – 2006 season.