What to do when hail hits

It was around 5pm on November 22, 2014, when a storm cell tore a path of destruction through vineyards and orchards at Gol Gol, Curlwaa, Coomealla and Mourquong. It was a day many growers would like to forget. Unfortunately, they can’t forget the once-in-a-lifetime storm event that destroyed an estimated 20,000 tonnes of wine grapes. Vines were stripped of leaves and bunches, and entire rows of vines had collapsed and were lying on the ground.

Monitoring and treatments

The trial sites have thrown up many questions and provided answers along the way. Photographs have been taken on a calendar and phenological stage to show differences regarding crop development.

One grower within days of the storm used three methods to prune: side prune, hedge and barrel prune. The hail fell from a south westerly direction as the winds pushed across the vineyards. East-west row orientation provided no cover from the storm on the western side of the vines. Due to the angle of the storm and intensity, varying degrees of damage to canes was evident.

Growers affected reached out to industry for information. Due to the late season storm event, industry had very little current research or findings on the best-case scenario for these growers. Murray Valley Winegrowers (MVW), with assistance from NSW Local Land Services (LLS) Officer Greg Moulds, are continuing to monitor the hail affected vineyards (all Shiraz) in the Gol Gol region after the November 2014 storm event.

Monitoring of trials conducted by two growers, with assistance from MVW and LLS, have provided valuable information on the best treatment of hail-damaged vines, particularly those at an advanced stage of maturity.

Table 1: Fertiliser treatments per block
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The initial response after the event had two blocks treated as follows: block 378 was box-pruned and block 16B had the top and one side pruned, which was the side that was not affected as severely. Products applied were to reduce plant stress and assist with a second induction period.

Block 378 received aminostim shortly after damage to help vines cope with stress and begin to regrow. Citogrower was applied when the vines started to flower again. On block 16B, Seasol was applied shortly after damage and again when flowering occurred. All products were applied at label rates. Observations from the growers included: vines should have received more water post damage, the seasol seemed to assist with relieving stress quickly, but the aminostim/citogrower combination had produced better results. The following season will give an indication of lignification and suitable scenarios for pruning.
The late season pruning affected the ripening of the vines from fully ripe bunches to second crop green bunches as noted in Photo 4. The fruit was then left on the vine as there were concerns with harvesting and downgrades.

Pruning in 2015 used the same method as in previous years (Photo 6). The effect of the storm event in late 2014 was evident; scar tissue was visible and there was a lack of fruiting wood on the south western side of the vines.

The vines all showed the same effects, even with the pruning carried out to rejuvenate new growth soon after the storm.
No apparent loss or significant decrease in yield noted from budburst to flowering. Vines have progressed without any major problems.

**Photo 6: August 2015 budburst**
Budburst was normal for the affected vines, with no major problems noted. The scar tissue had callused, allowing sap flow to terminal buds. Spurs were left longer than normal to check on possible yield decreases. These canes would be monitored over the growing period to see if any adverse effects to the fruit were noted.

**Photo 7: August 2015 budburst to flowering**
No apparent loss or significant decrease in yield noted from budburst to flowering. Vines have progressed without any major problems.

**Photo 8: November 2015 bunch closure**
Vines showed no signs of stress at bunch closure. Growth was vigorous as noted in the photos above.
Discussion

Information and advice on what to do after a late season hail event is scarce. Most literature is centred on early season damage well before flowering, and the Gol Gol incident occurred at a critical time around bunch closure.

The monitoring of trials by MVW and LLS in conjunction with growers has added to our understanding of the most appropriate follow-up treatment.

It was noted in monitored vineyards that basal buds started to burst within days of the hail event, which was a contributing factor to trial pruning to help with new growth. Vines were given a normal irrigation regime with fertiliser to aid in growth. A regime of daily watering and weekly fertilising to generate new shoots provided canes that were thicker and lignified late in the season. This lignification helped with greater cane selection for the coming season. Growers who did not prune and who had scaled-back irrigation found that vines had poorer quality canes going into the next season. Pruning of the trial sites at dormancy found that there was a greater number of lignified canes to choose from compared with other sites that had been left.

The basal buds that re-shot provided evidence that they did not lignify fully, leading to die-back in the blocks not pruned.

Four blocks have been monitored to gauge any differences between fertilisers. Each block consists of 3.5 hectares, with one being a control on which a normal fertiliser regime was maintained. On the others, one treatment consisted of six Seasol applications of 11.5 litres per hectare; another received one application of Stoller’s budfeed at budburst along with six applications of folizyme and ZM2 at label rates, while the remaining block took six applications of a combination of BioGrow products (Biostim, Aminostim and Citigrower). Each site produced similar yields, with no major stand outs.

It is suggested that another year of trials should be conducted to gain further information on yields and vine health two years after the event.

Conclusion

- Valuable information has been obtained. Should such an event occur again at a similar time of the year, growers should look to continue irrigating vines and fertilise to initiate new growth;

- Seasol seems to be the better performer, with canes having longer lignification points or nodes compared with other treatments. Other fertiliser treatments worked, but in the opinion of trial growers Seasol produced better canes;

- The trial sites also highlighted that irrigation should be increased to stimulate the vines vegetative growth;

- Pruning after the event is not advisable to chase a second crop. The cost of a second round of pruning and spray cannot be justified given current grape prices.