

Out, damned spot

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If Lady Macbeth had been an apple orchardist, she wouldn't just be talking about her hand. Apple Blackspot (*Venturia inaequalis*) is the scourge of many apple orchardists. We know a lot about this organism but it is still difficult to control. For those who don't know apple blackspot is a fungus that attacks leaves and fruit. It leaves a blemish on the fruit, which makes them unmarketable and can kill a tree if left unchecked. As with most pests and diseases early control is the key. Ascospores, produced by last years infections, mature and are released to give new infections. Their maturity is temperature dependant and their release is light and rain dependant. Ideal for a weather based model. Once released, growth and infection requires leaf wetness and suitable temperatures. Once again, ideal for a weather based model. This process happens until about mid December. A mature leaf or fruit based infection in the current season can infect further via spore produced that don't depend on light to infect. Therefore early control is critical. After that very brief introduction lets look at Hawkes Bay and Nelson this year.

Hawkes Bay

Early season spore discharge starts on August 23rd and ends about December 15th. From Figure 1 we can see that major releases in Hawkes Bay occurred on 5th October and 17th October. Compare this to Mills periods in this district. A wet early season was followed by a dry period in the middle of the season. Quite a few spores would have been released with no associated Mills period. Exactly what this means I am not sure but the wet early season wouldn't have helped because trees are that their most vulnerable during this period.

| Date | Temp. Sum | Maturity (%) | Spores Available(%) | Discharge (%) |
|------------|-----------|--------------|---------------------|---------------|
| 24/08/2008 | 24.7 | 0.6 | 0.6 | 0.6 |
| 25/08/2008 | 36.9 | 0.7 | 0.1 | 0.1 |
| 26/08/2008 | 48.5 | 0.8 | 0.1 | 0.1 |
| 27/08/2008 | 60.9 | 0.9 | 0.1 | 0.1 |
| 5/09/2008 | 151.8 | 2.1 | 1.3 | 1.3 |
| 6/09/2008 | 160.4 | 2.3 | 0.2 | 0.2 |
| 8/09/2008 | 179.9 | 2.8 | 0.5 | 0.5 |
| 9/09/2008 | 193 | 3.2 | 0.4 | 0.4 |
| 10/09/2008 | 204.1 | 3.6 | 0.4 | 0.4 |
| 11/09/2008 | 217.9 | 4.1 | 0.5 | 0.5 |
| 18/09/2008 | 288.1 | 7.9 | 3.8 | 3.8 |
| 19/09/2008 | 298.2 | 8.6 | 0.8 | 0.8 |
| 5/10/2008 | 494.1 | 40.1 | 31.5 | 31.5 |
| 6/10/2008 | 506.3 | 43.1 | 3 | 3 |
| 7/10/2008 | 523.6 | 47.4 | 4.3 | 4.3 |
| 17/10/2008 | 650.5 | 76.2 | 28.8 | 28.8 |
| 21/10/2008 | 697.9 | 83.7 | 7.5 | 7.5 |
| 23/10/2008 | 728.9 | 87.5 | 3.8 | 2.8 |
| 25/10/2008 | 761 | 90.6 | 4 | 4 |
| 26/10/2008 | 771 | 91.4 | 0.8 | 0.8 |
| 17/11/2008 | 1072.3 | 99.5 | 8.1 | 8.1 |
| 27/11/2008 | 1239.3 | 99.9 | 0.4 | 0.4 |
| 9/12/2008 | 1455.5 | 100 | 0.1 | 0.1 |

Figure 1 : Hawkes Bay Ascospore Discharge

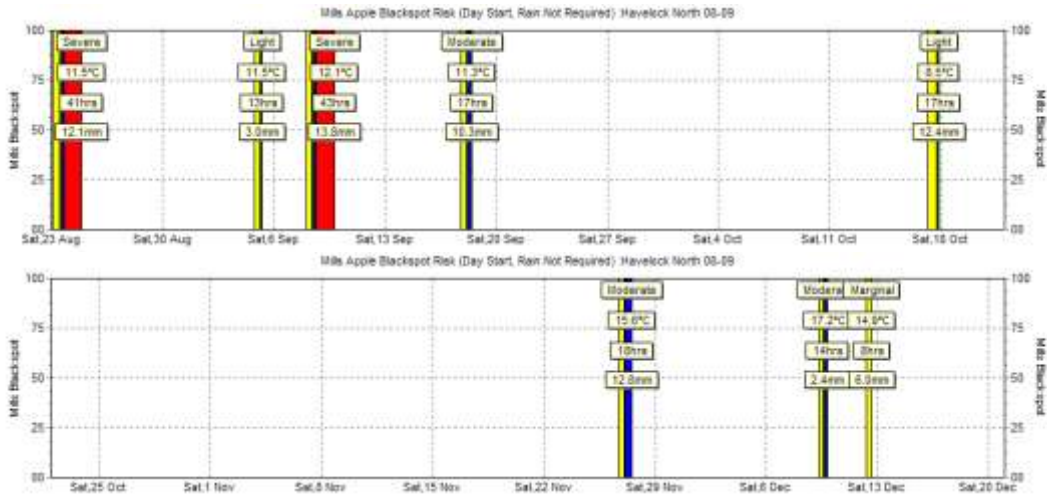


Figure 2 : Mills Periods in Hawkes Bay

Nelson

Nelson in contrast was much wetter with more Mills periods, as shown in Figure 4. The accompanying spore release shown in Figure 3 shows a more or less constant spore release making control much harder. Growers would have to focus on constant fungicide reapplication.

| Date | Temp. Sum | Maturity (%) | Spores Available(%) | Discharge (%) |
|------------|-----------|--------------|---------------------|---------------|
| 24/08/2008 | 18.7 | 0.6 | 0.6 | 0.6 |
| 25/08/2008 | 31.1 | 0.7 | 0.1 | 0.1 |
| 31/08/2008 | 89.7 | 1.2 | 0.5 | 0.5 |
| 2/09/2008 | 112.8 | 1.5 | 0.3 | 0.3 |
| 3/09/2008 | 124.8 | 1.6 | 0.2 | 0.2 |
| 4/09/2008 | 136.4 | 1.8 | 0.2 | 0.2 |
| 8/09/2008 | 174 | 2.7 | 0.8 | 0.8 |
| 9/09/2008 | 186.2 | 3 | 0.3 | 0.3 |
| 10/09/2008 | 195 | 3.3 | 0.3 | 0.3 |
| 12/09/2008 | 215 | 4 | 0.7 | 0.7 |
| 17/09/2008 | 270 | 6.7 | 2.7 | 2.7 |
| 18/09/2008 | 281.3 | 7.4 | 0.7 | 0.7 |
| 21/09/2008 | 316.7 | 10.2 | 2.8 | 2.8 |
| 29/09/2008 | 402.5 | 21.2 | 10.9 | 10.9 |
| 1/10/2008 | 420.1 | 24.2 | 3.1 | 3.1 |
| 7/10/2008 | 497 | 40.8 | 16.6 | 16.6 |
| 8/10/2008 | 507.9 | 43.5 | 2.7 | 2.7 |
| 17/10/2008 | 616.7 | 69.6 | 26.1 | 26.1 |
| 22/10/2008 | 676.1 | 80.5 | 11 | 11 |
| 23/10/2008 | 688.7 | 82.4 | 1.9 | 1.4 |
| 24/10/2008 | 701 | 84.2 | 2.2 | 2.2 |
| 1/11/2008 | 806.2 | 93.8 | 9.7 | 9.7 |
| 4/11/2008 | 845 | 95.7 | 1.9 | 1.9 |
| 5/11/2008 | 856 | 96.2 | 0.4 | 0.4 |
| 6/11/2008 | 864.1 | 96.4 | 0.3 | 0.1 |
| 10/11/2008 | 907.8 | 97.7 | 1.4 | 1 |
| 17/11/2008 | 1015.5 | 99.2 | 1.9 | 1.9 |
| 23/11/2008 | 1096.9 | 99.6 | 0.4 | 0.4 |
| 24/11/2008 | 1113.9 | 99.7 | 0.1 | 0.1 |
| 1/12/2008 | 1227.7 | 99.9 | 0.2 | 0.2 |
| 8/12/2008 | 1345.2 | 100 | 0.1 | 0.1 |

Figure 3 : Nelson Ascospore Discharge

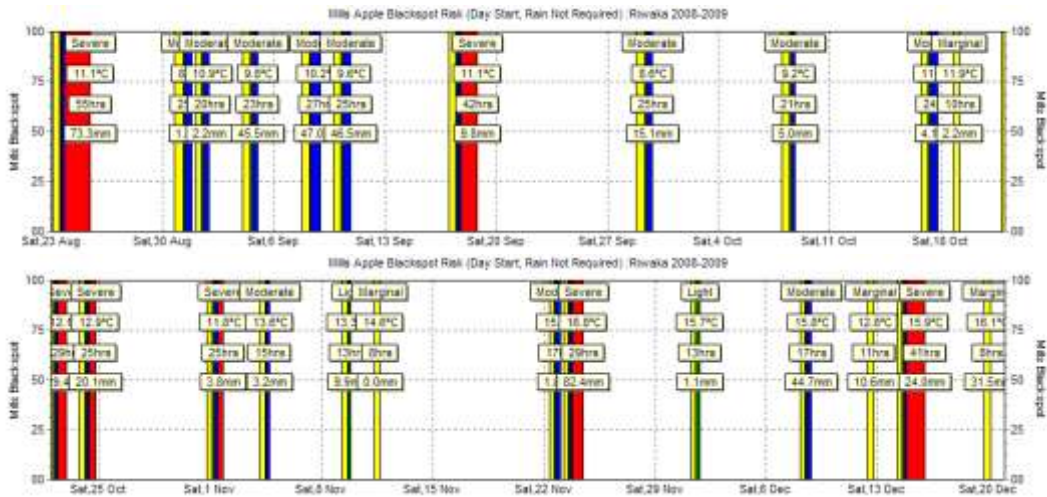


Figure 4 : Mills Periods in Nelson

Conclusion

A season of contrasts in each district. It will be interesting to compare packouts. Over the last few years, Nelson growers have consistently done better than the northern growers. A comparison of performance this year will be revealing.

All of this weather monitoring is done for growers via the HortPlus Metwatch Online service or via the Pipfruit industry website. Hawkes Bay has 15 weather stations and Nelson has 9. These stations are called frequently. The weather information also include a forecast updated 4 times per day. The Hawkes Bay is divided into 6 subregions Nelson into 4 subregions. The interesting thing about the weather forecast is that it is used to forecast spraying conditions to minimize spray drift as shown in Figure 5. Not only can the system show if you need to spray but also the best timing to minimize drift onto non-target areas. As always, feel free to send us an email if you have any questions.

