Copas of N.A.C.M. Writes:

We have plenty of problems with pests and diseases in our cider apple orchards, the worst of these is apple scab which blights the leaves and, if it strikes early in the season, can cause severe russeting on the skin of the fruitlets thus restricting their size and shape. Although we are not worried what the fruit looks like when it goes to the cider factory, we are concerned when a disease affects the crop. Apple scab is a fungal disease that infects by releasing its spores during warm, damp weather. Sometimes the leaf spots are so severe that the leaves begin to dry up prematurely and fall in the middle of summer. If the infection is that bad, then the trees will be weakened to such an extent that the next year's crop will be reduced too. Fortunately, with the aid of our DataHogs we are able to predict when conditions are favourable for scab infection. This gives us some very useful information for the growers to help manage their spray protection programs for their orchards.

A few years ago it would be standard practice to spray the trees every 10 14 days from the unfolding of the first leaves in spring until the end of May, sometimes even to the end of July in rainy summers. This can be an expensive and wasteful practice. For some time the cider industry has been keen to encourage growers to spray less often but more 'intelligently' to reduce the use of chemicals we use as much as possible, ideally only spraying as and when is necessary.

Our DataHogs collect orchard weather data; air and soil temperature, leaf wetness, rainfall and relative humidity; all the parameters that give us insight into how plant diseases will react. We download the data every week in the growing season by dialling up the DataHogs using the GSM/modem facility. This takes a few minutes to record onto the computer and gives an immediate record of the weather day by day. Then we interpret this data using a unique program designed by scientists specialising in fruit trees at East Malling Research Station near Maidstone in Kent. The ADEM program displays the results as infection risk periods and can also tell us how long it will take for the spores to develop to re-infect. This information is then sent by email to around 40 cider apple growers in Herefordshire and the South West to inform them of the high risk days for their scab susceptible varieties. They can then see if their reduced spray program has been adequate and if their trees were securely protected with active chemical at the time of the infection period. Should their protection have been lacking, all is not lost. We do have some specific spray chemicals that can work even after the fungal spores have penetrated the leaves and begun to spread. These chemicals have an activity with a 5 day 'kick-back' and about one weeks further protection . The grower then knows that he must get the spray on as quickly as possible to eradicate the developing mycelium and arrest the production of spores.

With such greater accuracy of prediction, the routine spray practice 'hit-and-miss' approach no longer applies. Providing that the weather cooperates with good spraying opportunities when needed, it is possible to get much better control of the disease, resulting in healthier trees and consistently better, more regular crops. Combined with the strategy of applying a protective spray before even the buds have opened, thus delaying scab development until later in the spring, with all the extra knowledge that the DataHogs give, growers are often able to reduce their spray input by more than 50%. This is also a considerable financial saving as well as good environmental practice.

Scab is not the only disease that cider apples suffer. Outbreaks and infection periods of powdery mildew, a disease that thrives in warm dry weather, can also be predicted in the same way. Growers can limit their sprays to just when the risk of infection is high. Now that our changing climate sometimes brings us unpredictable hot sunny days in early spring we are beginning to see the return of fire blight. Not common since the late 1980s, this bacterial disease revels in hot sunny weather around flowering time followed by warm windy and rainy days in May. The ADAM program can tell us when infection may have occurred and even predict the day on which the fire blight symptoms should arise. There is no cure for this disease and it can be lethal to young trees, so with the weather data, the grower will know exactly when he should be out monitoring his trees with his secateurs in hand to cut out and burn the first signs of blight.

Equipment Used

DataHog is the name for the family of Skye dataloggers. DataHog2 is used in the Cider Apple Orchards. DataHog2 is a versatile datalogger which can be used with a variety of sensors to monitor weather & climate parameters. Skye manufacture a wide range of sensors including the ones used in this application. Data can be offloaded from the DataHog in a number of ways including a remote access link as used here. Communication is made via the cellular phone network making a visit to the site unnecessary.

Further details: http://www.skyeinstruments.com/products/dataloggers/datahogs/