

Integrated Orchard Management and the Reduced Use of Pesticide Chemicals in Cider Orchards

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The close planting of intensive bush cider orchards is designed for a rapid and high yield of fruit, but good management and moderate pesticide inputs are essential to realise their full potential. In the past, the general attitude of cider growers was towards using a regular routine pesticide spray program regardless of need. Also, the widespread use of non-selective insecticides frequently resulted in the destruction of beneficial insects, pest resurgence with intensifies control problems, and the development of resistance to pesticides.

Since the 1990s, reduction of pesticide use in cider orchards has been a major objective of the NACM [National Association of Cider Makers] research, development and advisory service, and considerable advances in orchard practices have been made. Through on-going collaboration with the NACM, entomologists and plant pathologists from East Malling Research [EMR] have established a sustainable strategy for Integrated Pest Management [IPM] in cider orchards. Pest control is based on limited use of carefully timed and selected insecticide sprays to manage key pests with minimal impact on beneficial insects. Most growers now follow this strategy with successful results from only one annual pre-blossom insecticide in most years. One major pest, apple sawfly, is frequently suppressed by using an environmentally safer fungicide as an alternative to an insecticide. EMR work has made growers confident in reducing the rate of chemicals for certain uses. Growers are encouraged to lower spray inputs even more by making use of dual-purpose sprays where possible, for example the use of a scab fungicide which also suppresses rust mites.

Cider growers are now more aware of the influence of useful naturally occurring predatory and parasitic insects on pest control through lectures and demonstrations on pest/predator recognition, how to encourage beneficial insects into the orchard and how to maintain their numbers for successful sustainable biological control through use of well timed, less harmful insecticides. The NACM publication, Growers Update, is circulated in spring and autumn with advice and updates on the latest NACM trial results. The level of understanding of the principle of IPM is generally high as is awareness of the need for biodiversity and sympathetic use of the environment. The two major cider companies who run orchard competitions, judge entrants on the best balance of high commercial standards of fruit production with sensitive environmental management.

The use of fungicides to control diseases is essential for maintaining yields in intensive cider orchards. Although this type of chemical make less impact on the environment, there is scope for reducing their use from regular routine applications. This is a difficult practice in the South West where the climate limits spray opportunity but the introduction of computer models for the prediction of disease risk through monitoring weather conditions has helped to improve disease control, especially of scab, often with fewer, more efficiently used sprays. The NACM has its

own weather data recorders in cider orchards feeding information to a central computer using EMR's patented program ADEM to model apple diseases. Advice on disease risk in each location is then e-mailed to growers, enabling them to improve their spray decision making, to time sprays better using a more informed choice of appropriate fungicide and to with-hold sprays when disease risk is absent or minimal. Many growers now follow EMR's lead in using a pre-blossom protectant fungicide to delay the onset of scab infection and slow down disease build-up, thus reducing later spray input. Further trials show that by accelerating leaf rotting over winter growers can considerably reduce the carry-over of scab inoculum to the following year.

Ongoing research work is exploring the possibilities of using safer alternatives to pesticides such as foliar applied nutrients that have some activity against disease, and by using bio-stimulants to reduce the impact of diseases through improved tree health. Recent trials have shown the health benefits of introducing soil micro-flora at planting which may reduce pesticide inputs in the long-term. The use of parasitic nematode worms to control codling moth is being developed.

A more holistic approach towards general tree health is advocated and followed by many, concentrating on measured cultural practices to avoid tree stress and involving all aspects of orchard management, especially pruning and regulating cropping. Our recent advances and recommendations for Integrated Orchard Management have been published in the NACM booklet, *Growing Cider Apples, A guide to good orchard practice*. 2002, which gives a comprehensive view of our cider orchard best practices and is available to all growers.

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