

## European Organic Apple Production Demonstrates the Value of Pesticides

*International Pesticide Benefits Case Study No. 44, December 2011*

*Leonard Gianessi and Ashley Williams*

Organic apple orchards represent 4-8% of the total apple acreage in Italy, Germany and Switzerland [1]. Organic apple production in Europe is small and unstable due to yield and quality losses from key insects and diseases [2]. Organic apple growers face the same insect and disease problems as conventional and integrated pest management systems: apple scab, sooty blotch, codling moth, and rosy apple aphid. By contrast, the organic farmers have a much more limited range of approved products with which to try and control these pests.

Organic growers are prohibited the use of pesticides containing synthetic chemicals. They are permitted the use of pesticides that have approval by the EU Organic Standing Committee. These include products utilizing sulfur, copper, microorganisms, viruses, clay powders, and plant extracts (pyrethrum, neem). If it were not for these pesticides, it is unlikely that there would be any organic apple acreage in the EU since most apples in untreated orchards are damaged by codling moth and scab well above the zero tolerance for damage from these pests [3].

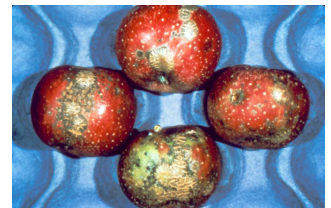
Organically-approved insecticides and fungicides are less efficacious and have limited control spectrums in comparison to synthetic chemical pesticides. As a result, organic apple yields in Europe are 30-50% lower than non-organic yields due to damage from pests [4],[5]. In situations of high disease or insect pressure, organic protection measures frequently fail [6].

The spraying of virus products has been commonly used in the EU for controlling codling moth in organic apple orchards. The virus must be eaten by the codling moth to be effective. The virus degrades in sunlight and heat and must be reapplied frequently: 7-10 times [7]. The virus is specific to codling moth. Thus, 1-2 other insecticides sprays are made (neem, pyrethrum) for rosy apple aphids. However, these products have limited effectiveness and aphids can cause a total harvest loss in organic orchards [8].

Organic apple growers typically make 9-11 applications of sulfur to control diseases [5]. However, since sulfur is rapidly washed off by rain, 20-40 applications are made by organic growers in years with extended rainy periods [9]. Sooty blotch causes heavy losses in organic orchards with low fungicide input [10].



Codling moth



Apple scab



Rosy apple aphid damage at left



Sooty blotch

### References

1. Granatstein, D., E. Kirby and H. Willer. 2010. Current world status of organic temperate fruits. *Acta Horticulturae*. 873:19.
2. Williams, M. 2011. Challenges for Danish organic apple production. FruitGowth. Archived at: <http://orgprints.org/20012>.
3. Jehle, J.A. 2008. The future of *Cydia pomonella* granulovirus in biological control of codling moth. *EcoFruit Proceedings*.
4. Bravin, E., et al. 2010. Economic evaluation of apple production systems. *Acta Horticulturae*. 873:219.
5. Bertschinger, L., et al. 2004. Ecological apple production: a comparison of organic and integrated apple-growing. *Acta Horticulturae*. 638:321.
6. Weibel, F.P., et al. 2007. Organic fruit production in Europe: success in production and marketing in the last decade, perspectives and challenges for the future development. *Acta Horticulturae*. 737:163.
7. Zingg, D. 2008. Madex Plus and Madex 112 overcome virus resistance of codling moth. *EcoFruit Proceedings*.
8. Jönsson, Å.H. 2007. *Organic Apple Production in Sweden: Cultivation and Cultivars*. Doctoral thesis, Swedish University of Agricultural Sciences, Alnarp.
9. Trapman, M. 2010. Copper free production of organic Elstar apples: three years experience in The Netherlands. *EcoFruit Proceedings*.
10. Mayr, U. and S. Späth. 2008. Sooty blotch of apple: Efficacy of different application strategies. *EcoFruit Proceedings*.