



Agriculture & Horticulture  
DEVELOPMENT BOARD



# Grower Summary

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## TF 177

Apples: Long term effects of applied  
composted green waste mulch on the cropping  
of Braeburn and Cox

Annual Report 2011

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## **Headline**

- The use of compost as a mulch can increase fruit number and fruit size.

## **Background and expected deliverables**

Previous work has been carried out to determine the effect of the application of composted green waste as a mulch in apple production. Positive effects on fruiting as well as growth have been observed but work tended to be relatively short term and concentrate on testing the effect in the years following planting. This project is a continuation of previous work funded by WRAP which tested the effect of green waste compost mulch on the growth and fruiting of two varieties of apple (Cox and Braeburn). This project is extending the evaluation of the effect on growth and fruiting of the trees. The final report will also include an economic analysis of the use of composted green waste as a mulch for apple production.

## **Summary of the project and main conclusions**

The trial was conducted on two apple varieties: Cox and Braeburn to which mulch was applied to half the field on two occasions. In 2004 when the trees were planted, a 10cm layer of compost was applied equating to a rate of 30 tonnes per hectare. This was then repeated in 2007. The mulched trees are being compared to those where the herbicide strip was left bare.

Fruit size was measured weekly from June to August and then again at harvest. Fruit number was also recorded at harvest. Fruit maturity tests were conducted on both varieties in September just prior to harvest as an additional measurement. Length of shoot growth was recorded in October. Soil, leaf and fruit nutrient analyses were conducted to determine the effect of mulch on soil nutrient content and uptake by the tree. Enviroscan soil moisture probes were used to determine the effect of compost on soil moisture content.

Fruit size increased by 6.7% in Cox but only by 2.1% in Braeburn. This was important because in addition to fruit size being increased with compost, so fruit number also increased in both varieties. In Braeburn the increase was 30% and in Cox, 23%. There was however significant tree to tree variation, so these differences were not statistically significant. Like last year, there was a difference in the amount of shoot growth between the two treatments with the compost increasing growth by 11% and 18% in Braeburn and Cox respectively. The combined effect of increased growth over the last 6 years has resulted in the compost treated trees filling their spaces whereas trees in the control plots have not. This was the reason the

compost treated trees were able to produce so much more fruit without a detrimental effect on fruit size.

The application of composted green waste increased the fruit nitrogen and decreased fruit phosphate levels. This has implications for fruit storability and may mean that fruit treated with compost will not store for as long as fruit from trees not treated with compost. It will certainly mean that fertilizer and foliar feed applications need to be based on analyses.

In 2009 there was a significant effect of treatment on soil moisture content with compost giving rise to a greater soil moisture content than the control. However, in 2010 there were no differences observed. This difference can be attributed to the overall amount of rainfall, which in 2010 was around 60% higher than in 2009. It is important though that significant differences between treatments were still seen even though the soil moisture content was the same in the two treatments.

## **Financial benefits**

The yield of Braeburn increased by 7.5kg per tree with the addition of compost. Yield of Cox increased by 5.5kg per tree with the addition of compost. Using a farm gate price of £80 for a 330kg bin, these represent increases in return of £1.81 per tree for Braeburn and £1.33 per tree for Cox. At the density of 2300 trees per hectare, these equate to increases of around £4200 and £3100 per hectare respectively.

## **Action points for growers**

- Use mulch to aid establishment and growth of trees.
- Mulch can be used in situations where increased growth is required. This has been shown to result in improved yield as tree volume increases.
- However, where vigour is already adequate or strong, the use of a mulch could lead to problems of excessive vigour.
- Conduct leaf and fruit analyses to determine whether fertilizer and foliar applications are necessary.
- Assess maturity and obtain fruit analysis separately to non-treated blocks of trees as maturity and storability can be affected by compost mulch applications.