Grower Summary

TF 207

Determination of the optimum pruning time for fruit wall orchard systems for Gala apple

Annual 2014

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Project Title:	Determination of the optimum pruning time for fruit wall orchard systems for Gala apple
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Further information

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GROWER SUMMARY

Headline

- Mechanical fruit wall cuts made after blossom reduced yields in comparison to winter hand pruning.

Background and expected deliverables

The fruit wall concept originated in France in 1986 where the system's potential to reduce pruning costs and increase yields was demonstrated. As UK growers consider adopting the fruit wall system, this trial aims to establish the optimum time to make the pruning cut. The timing of the cut determines the amount of vegetative re-growth and also whether the bud behind the cut becomes floral or remains vegetative. Determining the optimum time to perform the pruning cut will help to achieve maximum productivity from the fruit wall system.

The project was designed to test the effect of four timings of pruning a fruit wall mechanically compared to a winter hand pruned control. In addition, a further set of treatments were imposed in order to compare the effect of pruning between the trees by hand during the dormant period. Impacts of the cut timing on the yield, fruit quality and vegetative re-growth will be assessed. The trial will be conducted over five years in order to assess the long-term effects of the treatments.

Summary of the project and main conclusions

The trial was established to determine the optimum time to prune orchards planted as a fruit wall and to establish the effects of inter tree pruning. The five year trial established in 2012 is laid out in an existing commercial orchard of dessert apple variety Gala (clone Galaxy). 2013 was the second year of timed pruning treatments but the first year of inter tree pruning which was carried out in winter 2012/2013.

The pruning timings were based upon different growth stages: pink bud, 6 new leaves, 9 new leaves and 12 new leaves (or when 50% terminal buds were present).

There were significant effects of the time of pruning and inter tree pruning on the yield and fruit size. The winter hand pruning treatment gave the greatest yield and the smallest fruit size. There was no effect of treatment on the percentage red colouration. The maturity of fruit, as determined by percentage starch and fruit firmness at harvest, was not affected. However, differences in the Total Soluble Solids (TSS) were observed, with the pruning cuts made at the 6 and 9 leaf stages leading to lower values. The extension growth and number

of leaves was significantly reduced as pruning after blossom was delayed, confirming the results found in 2012.

In the first year of inter tree pruning, small effects on growth and fruit sugar levels were recorded in the plots pruned at the 9 & 12 leaf stage. Tests during subsequent years will show whether these are transient effects.

Main conclusions

- Mechanical fruit wall cuts made after blossom reduced yields in comparison to winter hand pruning.
- As the timing of the mechanical pruning was progressively delayed, less vegetative re-growth was stimulated.
- Mechanical cuts made at 6 or 9 leaves resulted in lower levels of leaf nitrogen and magnesium. Cutting at the 6 leaf stage also reduced leaf calcium levels to below optimum.
- Pruning cuts made at the 6 and 9 leaf stage reduced the Total Soluble Solids (TSS).
- Inter tree pruned treatments generally gave an increase in fruit size.

Financial benefits

The 2013 growing season was the first season where the combined effects of both the mechanical cuts and inter tree pruning were measured. The financial benefits are yet to be determined.

Action points for growers

- Early indications after two years of the trial are that where the grower's priority is growth control, later cuts are more effective but these can have adverse effects on fruit sugar levels.
- Care needs to be exercised if the system is adopted, as yield reductions compared to conventional pruning have been recorded.