Grower Summary

TF 206

Comparison of different planting material for fruit wall orchard systems for apple

Annual 2015

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Project Number:	TF 206
Project Title:	Comparison of different planting material for fruit wall orchard systems for apple
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GROWER SUMMARY

Headline

- Records and assessments of five different tree types for establishing Fruit Wall orchards commenced in 2014 and showed that the larger two year old tree types yielded most fruit and one year un-feathered trees the least.

Background and expected deliverables

Growers in many countries are actively looking for ways to reduce labour inputs and increase the use of mechanical aids in a range of fruit crops. With a general decline in skilled labour, ease of management is another requirement, but in all these developments it is essential that there is no loss of yield or quality. In fact, an increase in yields will be required to enable growers to maintain profitability.

Following the successful development and commercial uptake of the Concept Orchard (AHDB Horticulture Project TF 151) by many UK growers, further evolution and development of more intensive planting systems is being considered. In TF 151, reference was made to 'Le Mur Fruitier', a newly developed orchard system in France. Further developments of this system have been carried out privately and at the PC Fruit Research Station in Sint Truiden, Belgium. Generally this work has been done in existing orchards that have been adapted to the new pruning regime and generally on varieties not grown in the UK. Results have shown that the principles developed in the work by CTIFL in France can apply in more northern growing areas. However, they need to be adapted to local growing conditions and varieties, as the timing of pruning is critical and specific to individual varieties, whilst the length of the growing season varies in different geographical areas.

Little work has been done on ways of establishing Fruit Wall orchards and which type of tree gives the best results. Conventionally produced trees have a form and structure ideally suited to wider spacings, where a branch framework is necessary, but they can be adapted to be managed in a Fruit Wall planting. However, other tree types may be more suitable, either because they are cheaper and can be planted more intensively at the same cost per hectare, or because they have been specifically grown in the nursery to form a narrow, tall tree potentially giving higher, early yields.

Several specialist nurseries are developing tree types designed and grown especially for Fruit Wall orchards. These include 'grow through trees' from several nurseries, and

Bibaum® trees from Mazzoni nurseries. Other nurseries recommend that using a maiden tree or an 8 month tree at a close planting distance can give better results. This project will provide a comparison of five different tree types using a standard variety/ rootstock and spacing, and provide growers with comparable data to allow them to make informed decisions about the best tree type to use for their own situation.

Summary of the project and main conclusions

The trial was established to compare the performance (yield and grade out) of different nursery tree types when planted in an intensive orchard managed using the Fruit Wall system. Trees were planted and established during 2013.

2014 was the first fruiting season of the trial when records and assessments commenced.

There were statistically significant differences between yields - two year old tree types yielded most fruit and one year un-feathered the least.

A delay in applying one spray for scab resulted in an infection at the fruitlet stage which resulted in a high incidence of fruit scab at harvest. As the infection affected the whole area, the results from 2014 can still be used to compare the different tree types.

Most waste fruit was caused by scab rather than tree type or Fruit Wall pruning effects.

The trees have yet to fill their space and develop lateral branches, but the two year old trees are more advanced in this respect.

Financial benefits

It is too early in the trial to determine any financial benefits.

The trial is responding to the industry's need to shorten payback periods and to produce guidance on the cropping potential of different tree types in the early years.

The cost of establishing an intensive orchard is currently between £22k and £28k per hectare. In particular:

- The differences in cost of the various tree types available is quite small (typically around £0.50 per tree or £1,500 per ha), but a reduction in yield of 5% in each of the first four cropping years can reduce net returns by around £3,000 per ha. Some tree types have the potential to fill their space, vertically and horizontally, much more quickly, leading to increases in early yields, whilst others require more inputs in terms of pruning and thinning in order to achieve successful establishment.

- Although new intensive orchard systems are simpler and easier to prune than lower

density traditional orchards, it can still take between 25 and 40 man hours to prune a 1 hectare orchard. Rates of mechanical pruning are between 1.5 and 2.5 hours per ha depending on planting distance. Some hand pruning will be needed even where mechanical pruning is used but net savings of around £3,000 per ha over a 15 year orchard life are envisaged (net of machinery cost).

- Anecdotal evidence from experimental plots in Northern Europe suggests that annual yields from Fruit Wall plantings can be around 20 tonnes per ha greater than orchards of a similar density managed conventionally. The value to the grower of this increase would be approximately £21,000 net of all post harvest costs over 15 years.

- For growers to implement the system, they would have to rent or buy specialist pruning equipment. Current costs for this type of equipment are in the region of £14,000, but the machine also has the capability of being used for other operations on the farm such as hedge and windbreak cutting.

- There will be a need for good technology and knowledge transfer and possibly further development work. This is because the interaction between the Fruit Wall growing system and other orchard management operations (such as use of growth regulators for fruit setting and thinning) could well be different (possibly due to the effects of late pruning on leaf metabolism at a critical time of year during the early fruit development phase). As the leaf to fruit ratio is altered in the Fruit Wall, more attention to crop nutrition and leaf health will be necessary.

Action points for growers

- The 2014 season was the first fruiting season of the trial.
- The Fruit Wall cut was carried out when 9 new leaves had emerged on the current season's growth. To determine this, growers need to make random leaf counts regularly to establish the growth stage before making the cut.
- Other actions points will be determined in future years when it is established which tree type may be most suitable to Fruit Wall management in terms of early yield build up and highest yield of class 1 fruit.

