
The Best Practice Guide for UK Plum Production

Commercial and Demonstration Orchards for Post Project Research

New commercial and demonstration plum orchards planted at the end of the Innovate UK sustainable intensification of UK plum production project for post project research

Prof Jerry Cross, NIAB EMR

Dr Julien Lecourt, NIAB EMR

Dr Oliver Doubleday, G H Dean & Co.

Tom Hulme, A C Hulme & Sons

Charles Highwood, S W Highwood and Sons

In the Innovate UK sustainable intensification of UK plums project Innovate UK Project (No: 102133 1 February 2015 – 31 March 2019) three new commercial research orchards, one on each of three commercial farms, each of >1 ha in area and two under protection, were established in the last 6 months of the project one on each of the farms of the three grower partners in the project. These will allow ongoing research by growers and researchers beyond the project on three key aspects of UK plum production: 1) very early season production by using very early varieties grown under protection 2) the use of horticultural techniques (root pruning, PGRs) to induce more reliable cropping of very high fruit quality varieties which hitherto have not been profitable because of unreliability 3) very late season production in September and October, including the use of polytunnel protection to protect the fruit and reduce disease incidence. Additionally, a new research and demonstration orchard at NIAB EMR including a replicated comparison trial of the 23 preferred UK varieties, the two newly released very early varieties from the NIAB EMR breeding programme, the use of polytunnels to reduce disease incidence, a rootstock comparison trial and a strategic planting for demonstration of latest plum growing technologies. Details of these and the research objectives to be pursued in them are set out below:

New orchard at G H Dean & Co, Hempstead Farm, Bapchild, Sittingbourne (Led by Dr Oliver Doubleday)

The new orchard was planted in November 2018 on a site close to the farm offices, stores and packhouse at Hempstead Farm. The plan of the new planting is given in Figure 1 and a photo of the orchard in February 2019 in Figure 2. The varieties and the number of trees of each planted are given in Table 1. The rootstock is Wavit. The row spacing is 4.2 m and the tree spacing in the row 2.0 m. With a tree density of 1190 trees per ha, the orchard has an area of 2.31 ha. The research challenge to be addressed is the use modern horticultural techniques to achieve reliable productive cropping in very high fruit quality varieties which have hitherto been unreliable.

Table 1. Varieties and number of trees of each planted in the new commercial research plum orchard at G H Dean & Co., Hempstead Farm.			
Variety	Number of trees planted November 2019	Target number of trees	Trees to be late planted in winter 2019/20
Top Taste	498	500	2
Coe's Golden Drop	249	250	1
Avalon	166	195	29
Victoria	488	500	12
Malling P6-19	0	250	250
Harmona	477	500	23
Reeves	315	315	0
Juna	149	150	1
Hanka	76	90	14
Total		2750	

New orchard at AC Hulme and Sons, Hoaden Court, Ash, Canterbury (Led by Tom Hulme)

The new orchard (Cookhouse Covered Plums) was planted in November 2018 on a site 500 m NE of the farm yard at Hoaden Court. A photo of the orchard shortly after planting is shown in Figure 3 and a plan of the new planting in Figure 4. The varieties and the number of trees of each planted are given in Table 2. The rootstock is Wavit. The orchard comprises 12 zig zag rows of 96 trees. The 5.5 m distance between the centers of the zig-zag beds is determined by existing covering system. The two row beds planted with 0.75m tree spacing and 1.7m between beds i.e. 1.5 m zig zag. With a tree density of ~1988 trees per ha, the orchard has an area of 1.2 ha. The orchard is provided with fertigation. The research challenge to be addressed is very early cropping of very early and early varieties with an intensive system under protection.

Table 2. Varieties and number of trees of each planted in the new commercial research plum orchard at A C Hulme & Sons, Hoaden Court			
Variety	Number of trees planted November 2019	Target number of trees	Trees to be late planted in winter 2019/20
Victoria (maiden Wavit 4+)	96	96	
Juna (maiden Wavit 4+)	170	170	
Juna (maiden Wavit 1 yr RP)	406	406	
Herman (maiden Wavit 4+)	670	750	
Top Five (maiden Wavit 4+)	576	576	
Hanka (maiden Wavit 4+)	100	100	
Malling P7-38	0	192	192
Malling P6-19	0	96	96
Total		2386	

New orchard at S W Highwood, Sheerland Farm, Pluckley (Led Charles Highwood)

The new orchard (Goosemeadow Block 2) was planted in May 2019 on a site of the farm yard at Sheerland Farm. The varieties and the number of trees of each planted are given in Table 3. The rootstock is Wavit. Three planting systems are being compared (see Figure 6) as follows:

3.00 m x 1.75 m Spindle 1633 trees / ha block 1) 0.16 ha block 6) 0.15 ha

3.50m x 1.20 m Spindle 2381 trees / ha block 2) 0.18 ha block 5) 0.20 ha

3.00m x 2.00m Drapeau 1667 trees / ha block 3) 0.15 ha block 4) 0.16 ha

The research challenge to be addressed is late cropping of late varieties with an intensive system under protection versus outdoors. The benefits of protected cropping for yield, time of flowering and ripening on disease incidence and profitability will be investigated.

Variety	Number of trees planted November 2019	Target number of trees	Trees to be late planted in winter 2019/20
Victoria	286	286	0
Top Taste	500	500	0
Haroma	500	500	0
Harganta	500	500	0
Top End	500	500	0
Total		2286	

New experimental plantings and demonstration plots at NIAB EMR

New experimental plantings (see Figure 7) and demonstration plots have been established at NIAB EMR, comprising the following:-

1. *An experimental comparison of very intensive narrow row spacing (2.7 m) under protection versus outdoors of Victoria and the new early varieties Malling P6-19 and Malling P7-38*

The experimental plot comprises 4 tunnels, 73.3 m long x 8 m wide each containing 2 rows of 86 trees, including 1 row of Victoria planted Feb 2019 and 1 row of P6-19 or P7-38 (alternating whole rows of each variety) to be planted February 2020. Rows are spaced 2.7 m apart in the tunnels with trees 0.8 m apart in the rows (tree density 4630 trees/ha). The experimental planting will allow investigation of the benefits of protected cropping on yield, time of flowering and ripening and on disease incidence and profitability of Victoria and P6-19 and P7-38.

2. *An experimental comparison of the 23 preferred varieties for extended season cropping in the UK*

The experimental planting will comprise 4 replicated 5 tree plots of each of the 23 varieties (Herman, Katinka, Malling P7-38, Juna, Malling P6-19, Meritare, Opal, Lancelot, Avalon, Jubileum, Reeves (Savoury), Ferbleue, Top Five, Victoria, Haroma, Seneca, Top Taste, Coes Golden Drop, Laxtons Delicious, (Marjories Seedling, not preferred but late standard), Top Hit, Haganta, Top End) all on the Wavit rootstock propagated by F P Matthews to be planted winter

2019/20. The planting will allow replicated comparisons of the main horticultural characteristics of the varieties including time of flowering, ripening, self-compatibility, disease susceptibility, productivity and fruit quality of the preferred varieties.

3. *Performance of Victoria on 4 different rootstocks*

The experimental planting comprises 4 replicated 5 tree plots of Victoria on the following 4 rootstock on rootstocks of different vigour VVA1, WAGENINGEN, WAVIT and St JULIAN A. The planting will allow replicated comparisons of the performance of Victoria including, vigour/tree size, time of flowering, ripening, disease susceptibility, productivity, fruit size and quality of the preferred varieties.

4. *Replicated demonstration plots of Victoria planted in 4 different rootstocks with 4 different tree architecture systems*

The experimental planting established in 2016 comprises 2 replicated plots of 16 rootstock/tree architecture (all combinations of 4 Rootstocks of differing vigour VVA1, Pixy, Wavit, St Julien A and 4 Tree Structures achieved via husbandry methods Narrow A Frame, Narrow Table Top, Super Spindle , S System

5. *A replicated comparison of the two new Malling varieties P6-19 and P7-38 on Wavit versus St Julian A rootstock.*

The experimental planting (planted spring 2017) comprises 4 replicate 6 tree plots of each of the variety/rootstock combinations.

6. *A strategic planting of 5 rows of 60 trees of Victoria (Wavit rootstock) to provide a site for future experimental work*

Caution

The information contained within this Best Practice Guide is correct to the best of the authors' knowledge at the time of compilation but it must be understood that the biological material/systems and the regulatory framework referred to within these guides are subject to change over time. Anyone looking to make use of the information should check it against prevailing local conditions.

All pesticide recommendations and approvals are subject to change over time and the user of this Guide is reminded that it is his/her responsibility to ensure that any chemical intended for use by them is approved for use at the time of the intended application. The user is reminded that they must carefully read and follow the label on each chemical before applying any treatments.

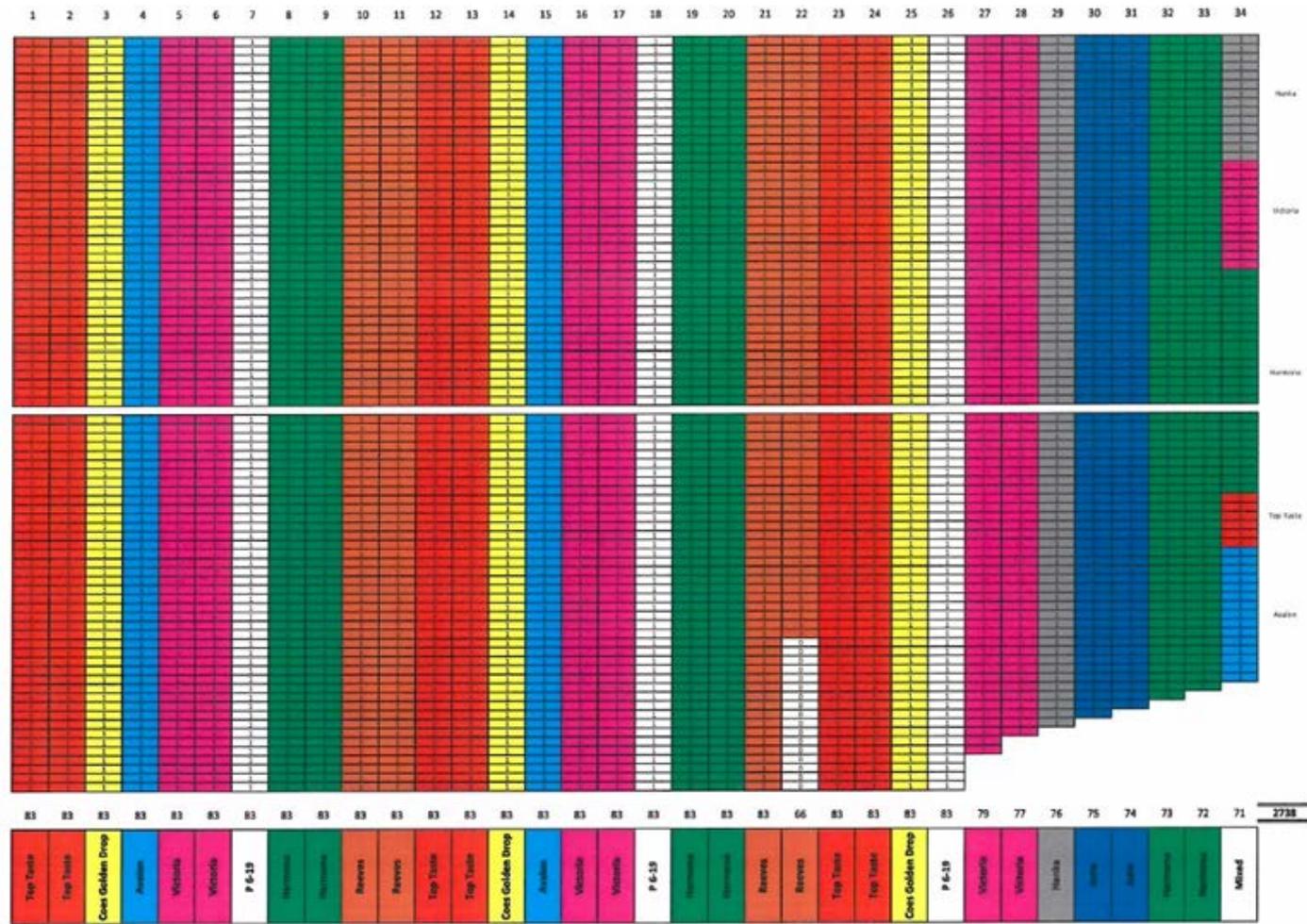


Figure 1. Planting plan of the new commercial research plum orchard at G H Dean & Co. Hempstead Farm



Figure 2. Photo of the new commercial research plum orchard at G H Dean & Co. Hempstead Farm taken 19 February 2019



Figure 3. Photograph of the new commercial research plum orchard at A C Hulme & Sons, Hoaden Court.

Figure 4. Planting plan of the new commercial research plum orchard at A C Hulme & Sons, Hoaden Court.

Row	Row	Variety	TOTAL	Area m2	Fertility
1	1	Hanka	48	0	Self
1	2	Herman/Hanka	48	216	Rated Self
2	3	Herman	48	235	Rated Self
2	4	Juna	48	294	Self
3	5	Juna	48	294	Self
3	6	Herman	48	235	Rated Self
4	7	Herman	48	235	Rated Self
4	8	Juna	48	294	Self
5	9	Juna	48	294	Self
5	10	Herman	48	235	Rated Self
6	11	Herman	48	235	Rated Self
6	12	Juna	48	294	Self
7	13	Juna	48	294	Self
7	14	Herman	48	235	Rated Self
8	15	Herman	48	235	Rated Self
8	16	Juna	48	294	Self
9	17	Juna	48	294	Self
9	18	Herman	48	235	Rated Self
10	19	Herman	48	235	Rated Self
10	20	Juna	48	294	Self
11	21	Juna	48	294	Self
11	22	Vics	48	0	Self
12	23	Vics	48	0	Self
16 rows Colt Cherries					
13	24	Top Five	48	0	Partially
14	25	Top Five	48	0	Partially

THE BEST PRACTICE GUIDE TO UK PLUM PRODUCTION – COMMERCIAL AND DEMONSTRATION ORCHARDS FOR POST PROJECT RESEARCH

14	26	Top Five	48	0	Partially
15	27	Top Five	48	0	Partially
15	28	P7-38	48	0	TBC
16	29	P7-38	48	0	TBC
16	30	P6-19	48	0	TBC
17	31	P6-19	48	0	TBC
17	32	P7-38	48	0	TBC
18	33	P7-38	48	0	TBC
18	34	Top Five	48	0	Partially
19	35	Top Five	48	0	Partially
19	36	Top Five	48	0	Partially
20	37	Top Five	48	0	Partially
20	38	Herman	48	235	Rated Self
21	39	Herman	48	235	Rated Self
21	40	Juna	48	294	Self
22	41	Juna	48	294	Self
22	42	Herman	48	235	Rated Self
23	43	Herman	48	235	Rated Self
23	44	Top Five	48	0	Partially
24	45	Top Five	48	0	Partially
24	46	Top Five	48	0	Partially
25	47	Top Five	48	0	Partially
25	48	Hanka	48	0	Self

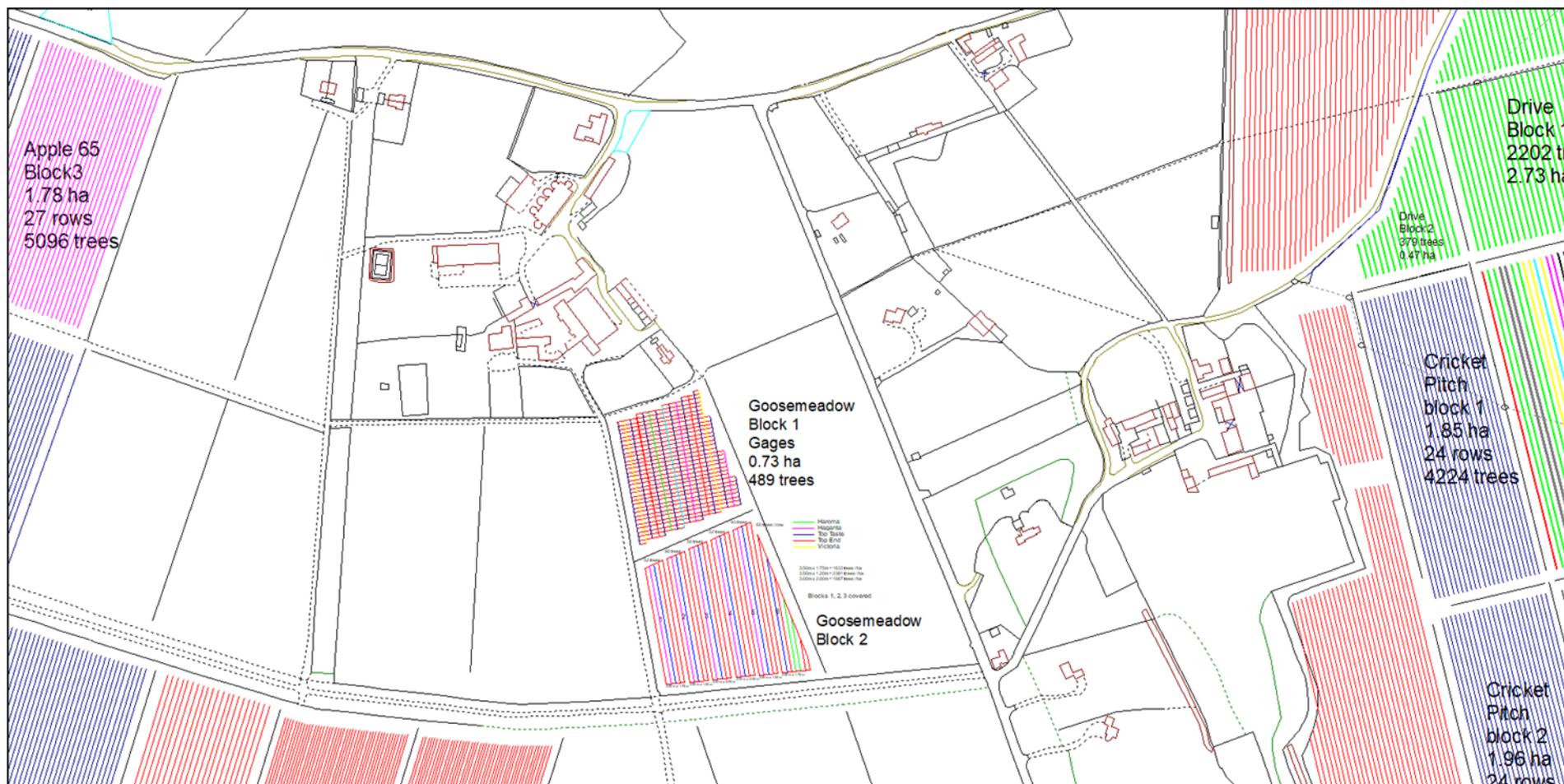


Figure 5. Location of the new commercial research plum orchard ‘Goosemeadow Block 2’ at S W Highwood, Sheerland farm.

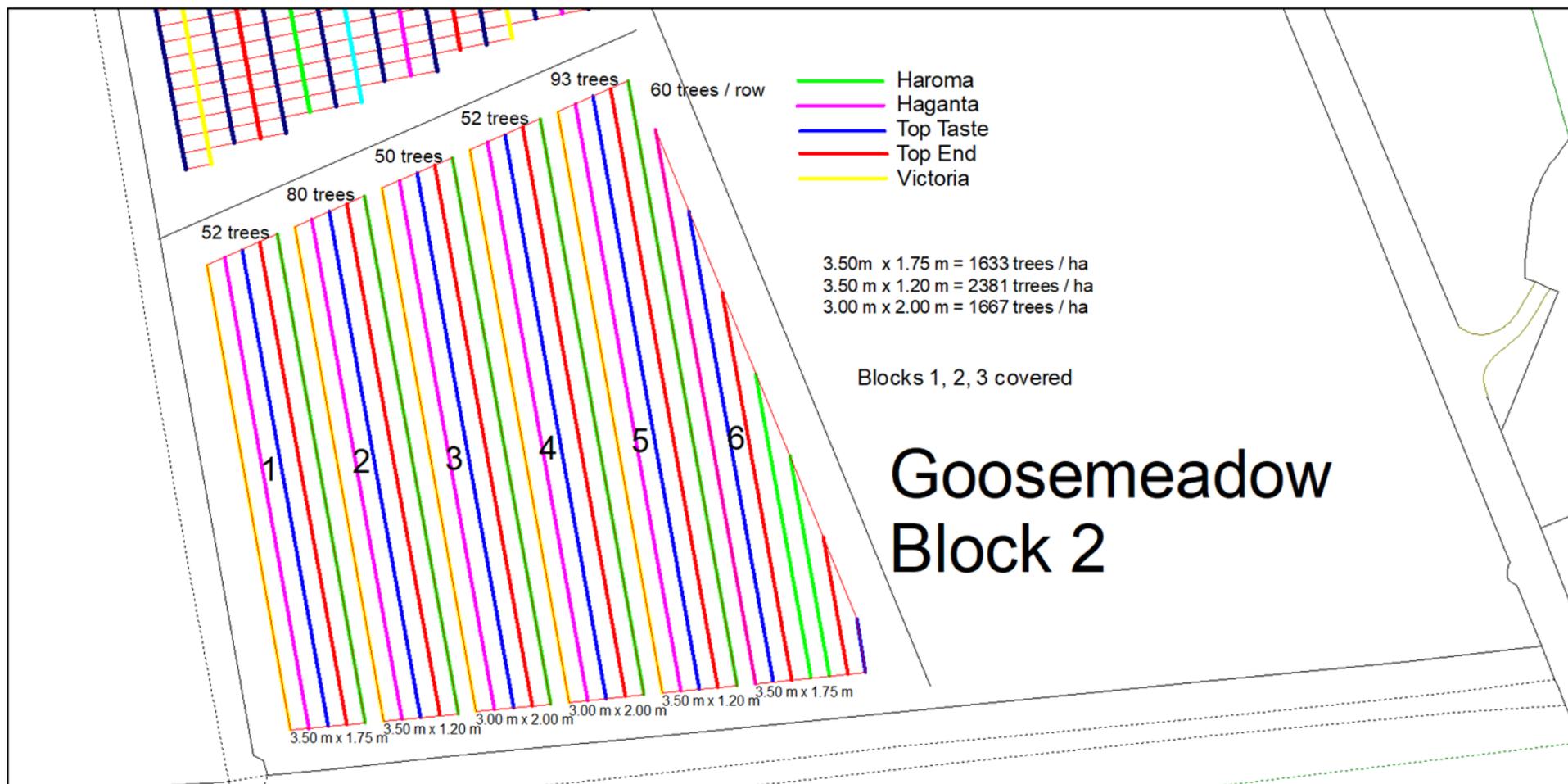


Figure 6. Planting plan of the new commercial research plum orchard 'Goosemeadow Block 2' at S W Highwood, Sheerland farm.

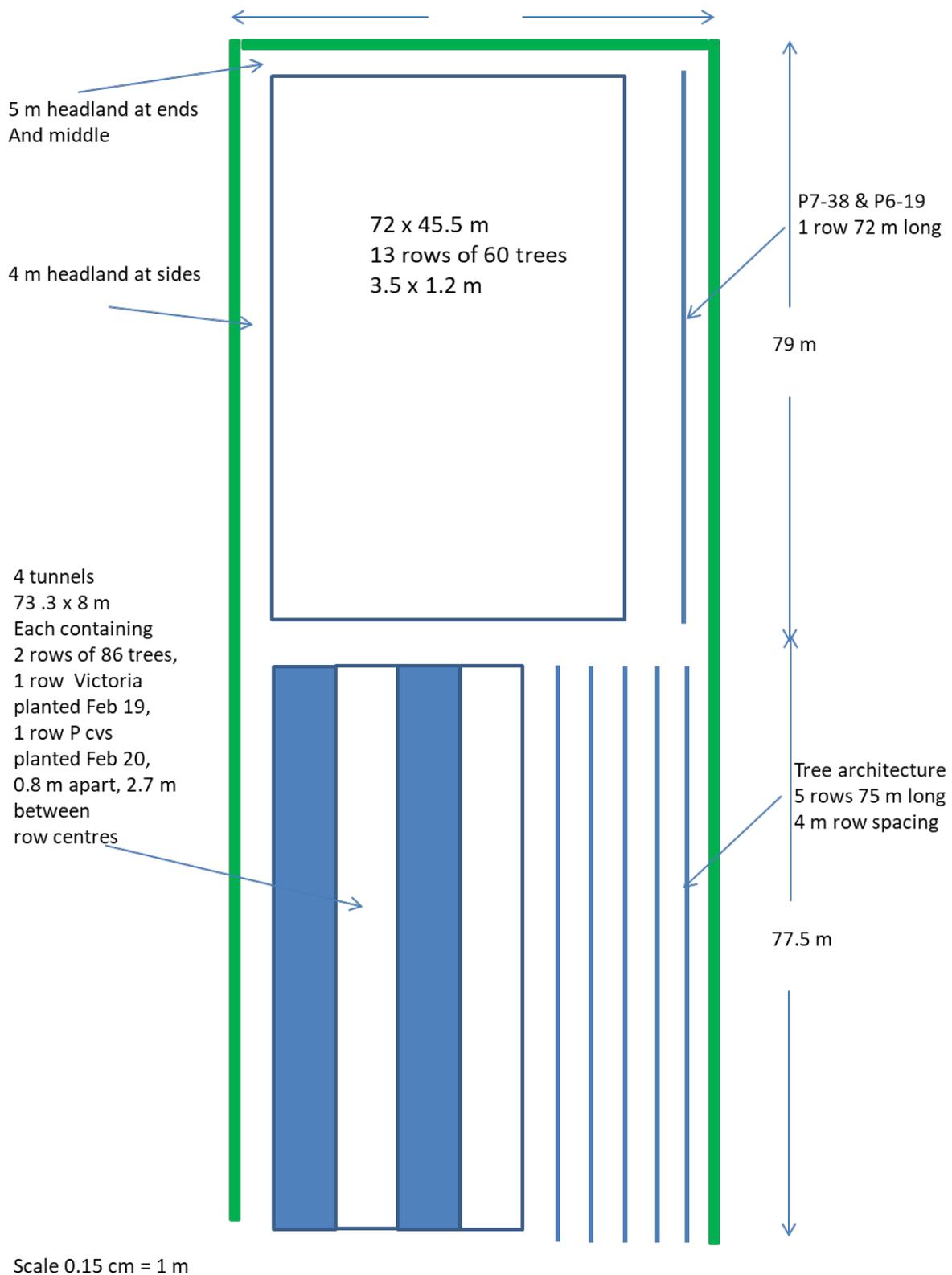


Figure 7. Layout of experiments in NIAB EMR research and demonstration plum orchard