

## Tree Systems at Oxtons



Fig 1. Overview of tree systems.

- A. Mixed fruit & support species. 12m spacings on keyline pattern.
- B. Mixed fuel, biomass, fodder & timber species amongst pasture. 12m spacing, N > S orientation.
- C. Mixed fruit & support species amongst no dig horticulture. 18m spacings on keyline pattern.
- D. Savannah style plantings of Juglan & Castanea species on a 12m isometric isometric spacing.
- E. Hardy fruits & mixed use support species amongst pasture & horticultural crops
- F. Salix windbreaks, alternately coppiced for biomass.
- G. Avenue planting
- H. Castanea in front northern border hedge.
- I. Laid border hedges



**Hedging.**

2287m of hedging. 2 rows at 50cm spacings = 9148 trees.

Hedging	Acer campestre (Field Maple) 25-40cm	1000	0.22	220	<a href="http://www.britishhardwood.co.uk/acer-campestre-field-maple/70/">http://www.britishhardwood.co.uk/acer-campestre-field-maple/70/</a>
	Alnus glutinosa (Common Alder) 25-40cm	1000	0.27	270	<a href="http://www.britishhardwood.co.uk/alnus-glutinosa-common-alder/125/">http://www.britishhardwood.co.uk/alnus-glutinosa-common-alder/125/</a>
	Carpinus betulus (Hornbeam)	1000	0.38	380	<a href="http://www.britishhardwood.co.uk/carpinus-betulus-hornbeam/91/">http://www.britishhardwood.co.uk/carpinus-betulus-hornbeam/91/</a>
	Castanea sativa (Sweet Chestnut)	500	0.58	290	<a href="http://www.treesplease.co.uk/product/castanea-sativa-sweet-chestnut/">http://www.treesplease.co.uk/product/castanea-sativa-sweet-chestnut/</a>
	Crataegus monogyna (Hawthorn )	2000	0.21	420	<a href="http://www.britishhardwood.co.uk/crataegus-monogyna-hawthorn/96/">http://www.britishhardwood.co.uk/crataegus-monogyna-hawthorn/96/</a>
	Fagus Sylvatica (Beech)	500	0.37	185	<a href="http://www.treesplease.co.uk/product/fagus-sylvatica-beech/">http://www.treesplease.co.uk/product/fagus-sylvatica-beech/</a>
	Malus Sylvestris (Crab Apple)	500	0.27	135	<a href="http://www.britishhardwood.co.uk/malus-sylvestris-crab-apple/105/">http://www.britishhardwood.co.uk/malus-sylvestris-crab-apple/105/</a>
	Prunus Spinosa ( Blackthorn )	500	0.21	105	<a href="http://www.britishhardwood.co.uk/prunus-spinosa-blackthorn/155/">http://www.britishhardwood.co.uk/prunus-spinosa-blackthorn/155/</a>
	Sorbus Aucuparia (Rowan)	500	0.28	140	<a href="http://www.britishhardwood.co.uk/sorbus-aucuparia-rowan-mountain-ash/176/">http://www.britishhardwood.co.uk/sorbus-aucuparia-rowan-mountain-ash/176/</a>
	Tilia Cordata (Small Leaved Lime)	500	0.46	230	<a href="http://www.britishhardwood.co.uk/tilia-cordata-small-leaved-lime/177/">http://www.britishhardwood.co.uk/tilia-cordata-small-leaved-lime/177/</a>
	Corylus avellana	1500	0.41	615	<a href="http://www.britishhardwood.co.uk/corylus-avellana-hazel/94/">http://www.britishhardwood.co.uk/corylus-avellana-hazel/94/</a>
	totals	9500		2990	

**Windbreaks**

1 row of Populus nigra behind 3 rows of salix viminalis. 1m spacings. 3600 trees

Windbreaks	Populus Nigra (Black Poplar)	900	0.69	621	<a href="http://www.britishhardwood.co.uk/populus-nigra-betulifolia-native-black-poplar/147/">http://www.britishhardwood.co.uk/populus-nigra-betulifolia-native-black-poplar/147/</a>
	Salix viminalis hybrid	2700	0.35	945	<a href="https://www.bowhayestrees.co.uk/willow-trees.html">https://www.bowhayestrees.co.uk/willow-trees.html</a>
	totals	3600		1566	

**Nut Plantings**

1 row of castanea along northern border opposite track. 480m @12m spacings =40. 31 Castanea on savannah style plantings west of market garden. 163 Juglan species on savannah style plantings. 234 trees.

Nut plantings	Castanea sativa (Grafted)	71	30	2130	<a href="http://www.gb-online.co.uk/prestashop/category.php?id_category=34">http://www.gb-online.co.uk/prestashop/category.php?id_category=34</a>
	Juglans ailantifolia (heartnut)	23	15	345	<a href="http://www.gb-online.co.uk/prestashop/category.php?id_category=94">http://www.gb-online.co.uk/prestashop/category.php?id_category=94</a>
	Juglans regis (grafted)	120	30	3600	<a href="http://www.gb-online.co.uk/prestashop/category.php?id_category=36">http://www.gb-online.co.uk/prestashop/category.php?id_category=36</a>
	Carya illinoensis (N. Pecan)	20	10	200	<a href="http://www.gb-online.co.uk/prestashop/category.php?id_category=37">http://www.gb-online.co.uk/prestashop/category.php?id_category=37</a>
	Totals	234		6275	

**Fuel, biomass, timber & fodder trees in flood meadow pastures**

Trees species suitable for flood meadows	
Timber	Prunus padus, Fraxinus excelsior, Carpinus betulus, Quercus sp, Salix alba carulea, Prunus avium, Sorbus aucuparia, Betula pendula, Juglan hybrids.
Coppicing, pollarding, biomass, fodder	Salix sp, Populus sp, Corylus avellana, Alnus sp, Fraxinus excelsior, Ilex aquifolium
Understory	Rubus fruticosus (blackberry), Cytisus scoparius (Broom), Rosa canina (Dog Rose), Sambucus nigra (Elder), Rosa avensis (field rose), Viburnum opulus (guelder rose)

	Menta sp, Symphytum sp (comfrey), Saponaria officinalis (soapwort), Fragaria vesca (wild strawberry), Rubus sp. Allium ursinum (Ransom), Malvaceae species (mallows), Angelica sylvestris (wild angelica), Aquilegia sp. (columbines), Cardamine pratensis (lady's smock), Centranthus ruber (Red valerian), Cichorium intybus (chichory), Blitum bonus-henricus (good king henry), Chamerion angustifolium (Rosebay Willowherb), Galium odoratum (sweet woodruff), Glechoma hederacea (ground-ivy), Levisticum officinale (lovage), Oxalis acetosella (woodsorrel), Polygonatum spp. (solomons seals), Rumex acetosa (sorrel), Stellaria graminea (lesser stitchwort), Filipendula ulmaria (meadowsweet), Primula vulgaris (primrose), Hypericum perforatum (st john's wort), Lotus corniculatus (birds foot trefoil), Lupinus perennis (wild lupin), Pulmonaria officinalis (Lungwort), Ajuga reptans (bugle), Vinca major (periwinkle), Lysimachia nummularia (creeping jenny).
Groundcover	



Fig 2. Alley layout of the eastern flood meadows.

Row	Length (m)	Spacing (m)	Trees	Usage	Species	Maintainence
1	18	4	5	Timber, Firewood, Fodder	Prunus padus, Fraxinus excellcior, Carpinus betulus, Quercus sp, Salix alba carulea, Prunus avium, Sorbus aucuparia, Betula pendula, Juglan hybrids.	Prune laterals, Thin as needed
2	32	1	32	Biomass, Fodder	Salix viminalis, Poplus nigra, Poplus alba	Pollard/Coppice on short rotation
3	46	4	12	Timber, Firewood, Fodder	Prunus padus, Fraxinus excellcior, Carpinus betulus, Quercus sp, Salix alba carulea, Prunus avium, Sorbus aucuparia, Betula pendula, Juglan hybrids.	Prune laterals, Thin as needed
4	60	1	60	Biomass, Fodder	Salix viminalis, Poplus nigra, Poplus alba	Pollard/Coppice on short rotation
5	73	4	19	Timber, Firewood, Fodder	Prunus padus, Fraxinus excellcior, Carpinus betulus, Quercus sp, Salix alba carulea, Prunus avium, Sorbus aucuparia, Betula pendula, Juglan hybrids.	Prune laterals, Thin as needed
6	87	1	87	Biomass, Fodder	Salix viminalis, Poplus nigra, Poplus alba	Pollard/Coppice on short rotation
7	97	4	25	Timber, Firewood, Fodder	Prunus padus, Fraxinus excellcior, Carpinus betulus, Quercus sp, Salix alba carulea, Prunus avium, Sorbus aucuparia, Betula pendula, Juglan hybrids.	Prune laterals, Thin as needed
8	105	1	105	Biomass, Fodder	Salix viminalis, Poplus nigra, Poplus alba	Pollard/Coppice on short rotation
9	111	4	28	Timber, Firewood, Fodder	Prunus padus, Fraxinus excellcior, Carpinus betulus, Quercus sp, Salix alba carulea, Prunus avium, Sorbus aucuparia, Betula pendula, Juglan hybrids.	Prune laterals, Thin as needed
10	115	1	115	Biomass, Fodder	Salix viminalis, Poplus nigra, Poplus alba	Pollard/Coppice on short rotation

11	119	4	30	Timber, Firewood, Fodder	Prunus padus, Fraxinus excelsior, Carpinus betulus, Quercus sp, Salix alba carulea, Prunus avium, Sorbus aucuparia, Betula pendula, Juglan hybrids.	Prune laterals, Thin as needed
12	120	1	120	Biomass, Fodder	Salix viminalis, Populus nigra, Populus alba	Pollard/Coppice on short rotation
13	119	4	30	Timber, Firewood, Fodder	Prunus padus, Fraxinus excelsior, Carpinus betulus, Quercus sp, Salix alba carulea, Prunus avium, Sorbus aucuparia, Betula pendula, Juglan hybrids.	Prune laterals, Thin as needed
14	117	1	117	Biomass, Fodder	Salix viminalis, Populus nigra, Populus alba	Pollard/Coppice on short rotation
15	102	4	26	Timber, Firewood, Fodder	Prunus padus, Fraxinus excelsior, Carpinus betulus, Quercus sp, Salix alba carulea, Prunus avium, Sorbus aucuparia, Betula pendula, Juglan hybrids.	Prune laterals, Thin as needed
16	81	1	81	Biomass, Fodder	Salix viminalis, Populus nigra, Populus alba	Pollard/Coppice on short rotation
16	66	4	17	Timber, Firewood, Fodder	Prunus padus, Fraxinus excelsior, Carpinus betulus, Quercus sp, Salix alba carulea, Prunus avium, Sorbus aucuparia, Betula pendula, Juglan hybrids.	Prune laterals, Thin as needed

Total timber trees: 192

Timber & Wood in East flood meadows	Prunus padus (Bird Cherry)	25	0.28	7	<a href="http://www.britishhardwood.co.uk/prunus-padus-bird-cherry/154/">http://www.britishhardwood.co.uk/prunus-padus-bird-cherry/154/</a>
	Carpinus betulus (Hornbeam)	50	0.38	19	<a href="http://www.britishhardwood.co.uk/carpinus-betulus-hornbeam/91/">http://www.britishhardwood.co.uk/carpinus-betulus-hornbeam/91/</a>
	Quercus robur (Oak)	25	0.32	8	<a href="http://www.britishhardwood.co.uk/quercus-robur-english-oak/157/">http://www.britishhardwood.co.uk/quercus-robur-english-oak/157/</a>
	Quercus petraea (Sessile Oak)	25	0.54	13.5	<a href="http://www.britishhardwood.co.uk/quercus-petraea-sessile-oak/156/">http://www.britishhardwood.co.uk/quercus-petraea-sessile-oak/156/</a>
	Salix alba carulea (cricket Bat Willow)	25	1.28	32	<a href="https://www.ashridgetrees.co.uk/cricket-bat-willow-salix-alba-caerulea/">https://www.ashridgetrees.co.uk/cricket-bat-willow-salix-alba-caerulea/</a>
	Prunus avium (Wild Cherry)			0	
	Sorbus Aucuparia (Rowan)	25	0.28	7	<a href="http://www.britishhardwood.co.uk/sorbus-aucuparia-rowan-mountaine-ash/176/">http://www.britishhardwood.co.uk/sorbus-aucuparia-rowan-mountaine-ash/176/</a>
	Juglan nigra	30	1.26	37.8	<a href="http://www.britishhardwood.co.uk/juglans-nigra-black-walnut/138/">http://www.britishhardwood.co.uk/juglans-nigra-black-walnut/138/</a>
	Totals	205		124.3	

Total biomass/coppice trees: 722

East Flood Meadows Biomass alleys	Salix viminalis hybrid	360	0.35	126	<a href="https://www.bowhayestrees.co.uk/willow-trees.html">https://www.bowhayestrees.co.uk/willow-trees.html</a>
	Populus hybrid	360	0.35	126	<a href="https://www.bowhayestrees.co.uk/willow-trees.html">https://www.bowhayestrees.co.uk/willow-trees.html</a>
	Totals	720		252	

## Mixed Fruit Silvopasture.

Temperate Top Fruit Species.	
Top Fruit species	Malus domestica (apple), Prunus domestica (plum), Prunus armenica (apricot), Prunus avium (cherry), , Prunus insititia (damson) Pyrus spp (pear), Prunus persica (peach), Prunus cerasus (sour cherry), Prunus cerasifera (mirabelle), Ficus carica (fig), Mespilus germanica (medlar), Prunus salicina (japanese plum), Asimina triloba (pawpaw), Cornus kousa, Crataegus spp, Diospyros lotus (date plum), Diospyros virginiana (american persimmon), Morus spp (mulberries), Sambucus canadensis (american elder).
shrub species	Psuedoacacia robinia (Black Locust), caragana arborescens (siberian pea), Cytisus scoparius (Broom), Elaeagnus spp. (Autumn olive, russian olive), Hippophae rhamnoides (Seabuckthorn),
Understory	Amelanchier alnifolia (Juneberry), Ribes spp. (Jostaberry, Worcesterberry, Blackcurrant, white/redcurrant, gooseberry), Rubus spp (Blackberry, Raspberry, Loganberry), Vaccinium spp (Blueberries), Aronia prunifolia (Aronia berries), Lonicera caerulea (Honeyberry), Fragaria (Strawberry).



	<p>Menta sp (Mints), Symphytum sp (comfrey), Saponaria officinalis (soapwort), Fragaria vesca (wild strawberry), Rubus sp. Allium ursinum (Ransom), Malvaceae species (mallows), Angelica sylvestris (wild angelica), Aquilegia sp. (columbines), Cardamine pratensis (lady's smock), Centranthus ruber (Red valerian), Cichorium intybus (chichory), Blitum bonus-henricus (good king henry), Chamerion angustifolium (Rosebay Willowherb), Galium odoratum (sweet woodruff), Glechoma hederacea (ground-ivy), Levisticum officinale (lovage), Oxalis acetosella (woodsorrel), Polygonatum spp. (solomons seals), Rumex acetosa (sorrel), Stellaria graminea (lesser stitchwort), Filipendula ulmaria (meadowsweet), Primula vulgaris (primrose), Hypericum perforatum (st john's wort), Lotus corniculatus (birds foot trefoil), Lupinus perennis (wild lupin), Pulmonaria officinalis (Lungwort), Ajuga reptans (bugle), Vinca major (periwinkle), Lysimachia nummularia (creeping jenny).</p>
Groundcover	

644m of alleys @ 3m spacings = 214 trees



Fig 3. Mixed fruit silviopasture row layout.

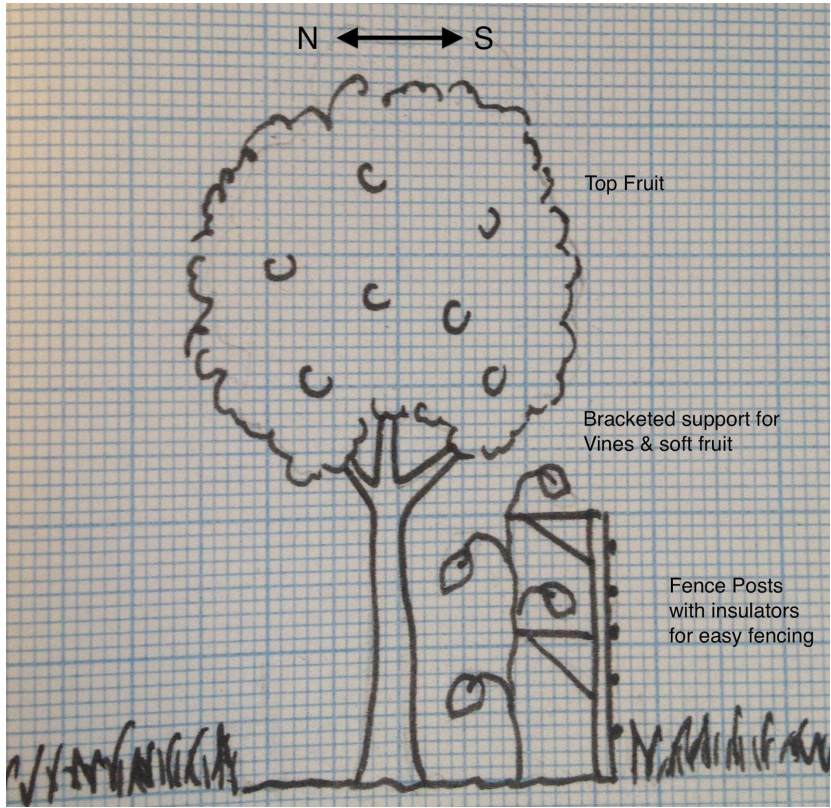


Fig 4. Planting structure.





Fig 6. Mixed fruit silviopasture harvesting pattern.

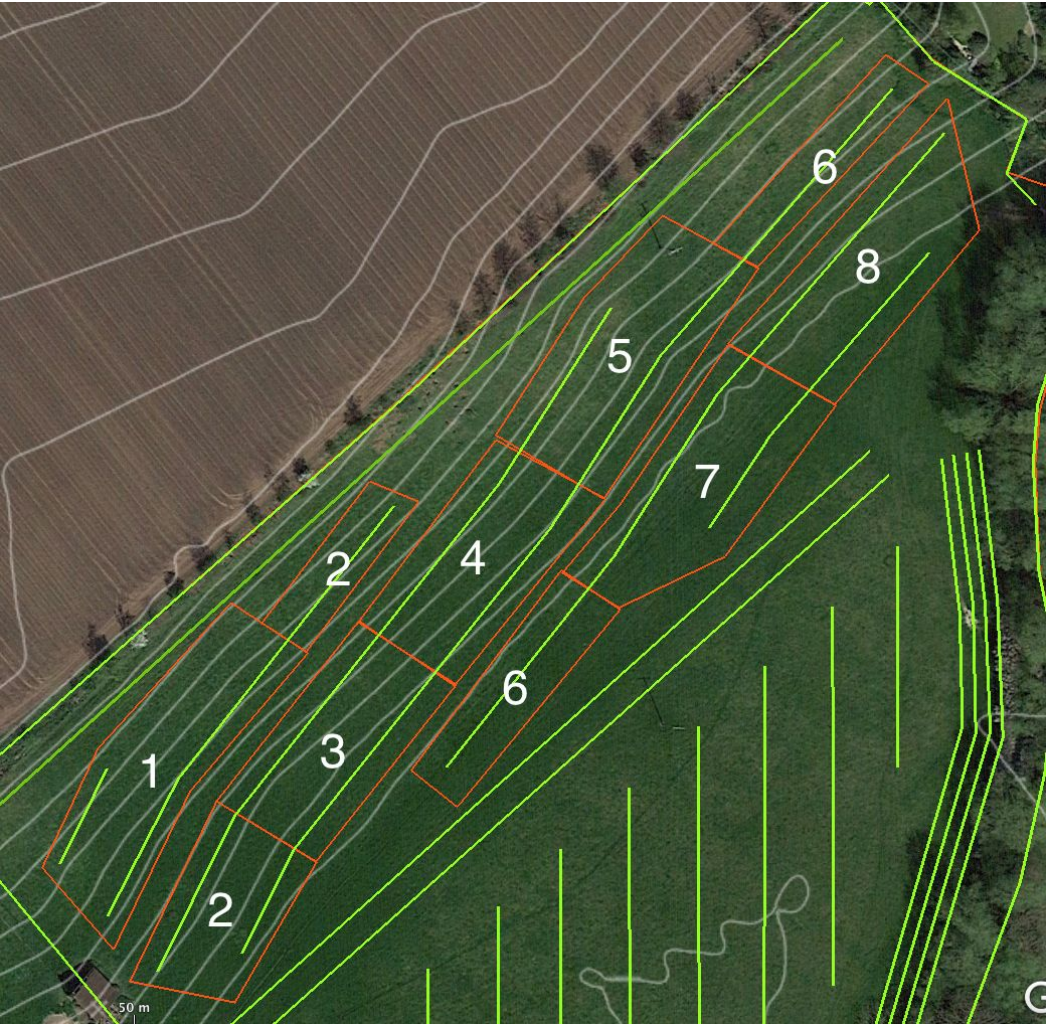


Fig 7. Harvest blocks.

**Top Fruit Harvest calendar**

		Species	Variety	Quantity	Harvest Beginning	Length of row	Spacing (m)	Cost per unit	Subtotal	Source
Block 1	Top Fruit	Prunus Domestica (Plum)	Herman	4	13/7		3	18.5	111	<a href="https://walcotnursery.co.uk/product/herman/">https://walcotnursery.co.uk/product/herman/</a>



<b>Block 2</b>		Prunus Domestica (Plum)	Opal	6	13/7		3	18.5	74	<a href="https://walcotnursery.co.uk/product/opal/">https://walcotnursery.co.uk/product/opal/</a>
		Prunus Avium (Cherry)	Lapins	6	29/6		3	12	72	<a href="https://walcotnursery.co.uk/product/lapins/">https://walcotnursery.co.uk/product/lapins/</a>
		Prunus Avium (Cherry)	Stella	4	13/7		3	12	48	<a href="https://walcotnursery.co.uk/product/stella/">https://walcotnursery.co.uk/product/stella/</a>
		NF - Psuedoacacia robinia		6	=		3	0.9	5.4	<a href="http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0">http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0</a>
			Totals	26			1		310.4	
	<b>Soft Fruit</b>	Raspberry	Glen Ample	50	22/6	20	0.4	1	50	<a href="https://walcotnursery.co.uk/product/glen-ample/">https://walcotnursery.co.uk/product/glen-ample/</a>
		Blackcurrant	Ben Hope	17		20	1.2	0	0	Home Prop
		Honeyberry	=	7		10	1.5	10	70	<a href="https://www.frankpmatthews.com/catalogue/honeysuckle/11661">https://www.frankpmatthews.com/catalogue/honeysuckle/11661</a>
		Chuckleberr y	=			10	1.2	7.25		
		Saskatoon	=	13		20	1.5	10	130	Pershere juneberries? <a href="https://www.frankpmatthews.com/catalogue/saskatoon/12200">https://www.frankpmatthews.com/catalogue/saskatoon/12200</a>
			Totals	87		80			250	
	<b>Top Fruit</b>	Malus Domestica (Apple)	Beauty of Bath	4	3/8		3	16.25	65	<a href="https://walcotnursery.co.uk/product/beauty-of-bath/">https://walcotnursery.co.uk/product/beauty-of-bath/</a>
		Prunus domestica (Plum)	Early prolific	4	27/7		3	18.5	74	<a href="https://walcotnursery.co.uk/product/early-prolific/">https://walcotnursery.co.uk/product/early-prolific/</a>
		Prunus armenica (Apricot)	Tomcot	2	28/7		3	25	50	<a href="https://www.frankpmatthews.com/catalogue/apricot/10023">https://www.frankpmatthews.com/catalogue/apricot/10023</a>
		Prunus Avium (Cherry)	Sunburst	6	27/7		3	12	72	<a href="https://walcotnursery.co.uk/product/sunburst/">https://walcotnursery.co.uk/product/sunburst/</a>
		Prunus cerasifera (Mirabelle)	golden sphere	1			3	18.95	18.95	<a href="https://www.orangepippintrees.co.uk/mirabelle-trees/golden-sphere">https://www.orangepippintrees.co.uk/mirabelle-trees/golden-sphere</a>
		Morus (Mulberry)	Carmen	1	27/7		3	22	22	<a href="https://www.agroforestry.co.uk/product/mulberry-morus-alba-x-rubra-carman/">https://www.agroforestry.co.uk/product/mulberry-morus-alba-x-rubra-carman/</a>
		NF - Elaeagnus umbellata (Autumn olive)	=	8			3	9	72	<a href="https://www.burncoose.co.uk/site/plants.cfm?pl_id=1647">https://www.burncoose.co.uk/site/plants.cfm?pl_id=1647</a>
			Totals	26			1		301.95	
	<b>Soft Fruit</b>	Raspberry	Glen Ample	50		20	0.4	1	50	<a href="https://walcotnursery.co.uk/product/glen-ample/">https://walcotnursery.co.uk/product/glen-ample/</a>
		Gooseberry	Hinnomaki Red	17		20	1.2	7.25	123.25	<a href="https://walcotnursery.co.uk/product/hinnonmaki-red/">https://walcotnursery.co.uk/product/hinnonmaki-red/</a>
		Tayberry		10		10	1	7.25	72.5	<a href="https://walcotnursery.co.uk/product/tayberry/">https://walcotnursery.co.uk/product/tayberry/</a>
		Jostaberry		7		10	1.5	6	42	<a href="https://www.agroforestry.co.uk/product/jostaberry-ribes%C2%85/">https://www.agroforestry.co.uk/product/jostaberry-ribes%C2%85/</a>
		Blackberry	Karaka Black	27		20	0.75	4	108	<a href="https://www.primrose.co.uk/blackberry-karaka-black-9cm-pot-p-106063.html">https://www.primrose.co.uk/blackberry-karaka-black-9cm-pot-p-106063.html</a>
			Totals			80	16.25		395.75	
<b>Block 3</b>	<b>Top Fruit</b>	Malus domestica (Apple)	Discovery	4	17/8		3	16.25	65	<a href="https://walcotnursery.co.uk/product/discovery/">https://walcotnursery.co.uk/product/discovery/</a>

Block 4		Prunus domestica (Plum)	Pershire emblem	4	17/8		3	18.5	74	<a href="https://walcotnursery.co.uk/product/pershire-emblem/">https://walcotnursery.co.uk/product/pershire-emblem/</a>
		Pear	Beurre Precose Morettini	2	17/8		3	17.25	34.5	<a href="https://walcotnursery.co.uk/product/beurre-precose-morettini/">https://walcotnursery.co.uk/product/beurre-precose-morettini/</a>
		Peach	Avalon Pride	2	10/8		3	30	60	<a href="https://www.frankpmatthews.com/catalogue/peach/11501">https://www.frankpmatthews.com/catalogue/peach/11501</a>
		Apricot	Goldcot	2	10/8		3	30	60	<a href="https://www.frankpmatthews.com/catalogue/apricot/10022">https://www.frankpmatthews.com/catalogue/apricot/10022</a>
		Prunus avium (Cherry)	Penny	4	10/8		3	19.5	78	<a href="https://walcotnursery.co.uk/product/penny-r/">https://walcotnursery.co.uk/product/penny-r/</a>
		NF - Goumi		8				9	72	<a href="http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0">http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0</a>
			Totals	26			1		371.5	
	Soft Fruit	Raspberry	Glen Ample	75	10/8	30	0.4	1	75	<a href="https://walcotnursery.co.uk/product/autumn-bliss/">https://walcotnursery.co.uk/product/autumn-bliss/</a>
		Blackberry	Waldo	40	10/8	30	0.75	7.25	290	<a href="https://walcotnursery.co.uk/product/waldo/">https://walcotnursery.co.uk/product/waldo/</a>
		White currant	Blanka	6.66666667	10/8	10	1.5	6	40	<a href="https://www.agroforestry.co.uk/product/whitecurrant-ribes-rubrum-blanka/">https://www.agroforestry.co.uk/product/whitecurrant-ribes-rubrum-blanka/</a>
		Loganberry		13.33333333		10	0.75	7.25		<a href="https://walcotnursery.co.uk/product/loganberry/">https://walcotnursery.co.uk/product/loganberry/</a>
			Totals			80	16.25		405	
	Top Fruit	Malus domestica (Apple)	Tydemans early Worcester	4	24/8		3	16.25	65	<a href="https://walcotnursery.co.uk/product/tydemans-early-worcester/">https://walcotnursery.co.uk/product/tydemans-early-worcester/</a>
		Gage	Cambridge Gage	4	24/8		3	18.5	74	<a href="https://walcotnursery.co.uk/product/cambridge-gage/">https://walcotnursery.co.uk/product/cambridge-gage/</a>
		Pear	Beth	4	24/8		3	17.25	69	<a href="https://walcotnursery.co.uk/product/beth/">https://walcotnursery.co.uk/product/beth/</a>
		Damson	sweet damson	2	31/8		3	18.5	37	<a href="https://walcotnursery.co.uk/product/sweet-damson/">https://walcotnursery.co.uk/product/sweet-damson/</a>
		Mirabelle	Mirabelle de nancy	2	31/8		3	18.95	37.9	<a href="https://www.orangeppintrees.co.uk/mirabelle-trees/mirabelle-de-nancy">https://www.orangeppintrees.co.uk/mirabelle-trees/mirabelle-de-nancy</a>
		Mulberry	Wellington	1	31/8		3	19.99	19.99	<a href="https://www.primrose.co.uk/mulberry-wellington-tree-imorus-nigrai-bare-root-p-103237.html">https://www.primrose.co.uk/mulberry-wellington-tree-imorus-nigrai-bare-root-p-103237.html</a>
		Cornus mas	Gourmet	1	31/8		3	19.2	19.2	<a href="https://www.agroforestry.co.uk/product/cornelian-cherry-cornus-mas-gourmet/">https://www.agroforestry.co.uk/product/cornelian-cherry-cornus-mas-gourmet/</a>
		Prunus domestica (Plum)	Excalibur	2	24/8		3	0	0	Home Propagation
		Psuedoacacia Robinia		6			3	0.9	5.4	<a href="http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0">http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0</a>
			Totals	26			12.5		327.49	
	Soft Fruit	Actinidia arguta	Scarlet September	8		40	5	12.5	100	<a href="https://www.agroforestry.co.uk/product/kiwi-actinidia-arguta-scarlet-september/">https://www.agroforestry.co.uk/product/kiwi-actinidia-arguta-scarlet-september/</a>
		Actinidia arguta	Weiki male	1		5	5	12.5	12.5	<a href="https://www.agroforestry.co.uk/product/kiwi-actinidia-arguta-weiki-male/">https://www.agroforestry.co.uk/product/kiwi-actinidia-arguta-weiki-male/</a>
		Raspberry	Autumn Bliss	100		40	0.4	1	100	<a href="https://walcotnursery.co.uk/product/autumn-bliss/">https://walcotnursery.co.uk/product/autumn-bliss/</a>
			Totals			85	16.25		212.5	



Block 5	Top Fruit	Apple	Cevaal	4	7/9		3	16.25	65	<a href="https://walcotnursery.co.uk/product/cevaal/">https://walcotnursery.co.uk/product/cevaal/</a>
		Plum	Kirkes Blue	4	7/9		3	18.5	74	<a href="https://walcotnursery.co.uk/product/kirkes-blue/">https://walcotnursery.co.uk/product/kirkes-blue/</a>
		Pear	Onward	2	14/9		3	17.25	34.5	<a href="https://walcotnursery.co.uk/product/onward/">https://walcotnursery.co.uk/product/onward/</a>
		Pear	Merton Pride	2	15/9		3	17.25	34.5	<a href="https://walcotnursery.co.uk/product/merton-pride/">https://walcotnursery.co.uk/product/merton-pride/</a>
		Gage	Coe's golden drop	4	7/9		3	18.5	74	<a href="https://walcotnursery.co.uk/product/coes-golden-drop/">https://walcotnursery.co.uk/product/coes-golden-drop/</a>
		Asimila Triloba	PawPaw	2	7/9		3	12	24	<a href="http://www.gb-online.co.uk/prestas hop/category.php?id_category=27">http://www.gb-online.co.uk/prestas hop/category.php?id_category=27</a>
									0	
		NF - Elaeagnus umbellata (Autumn olive)	=	8			3	9	72	<a href="https://www.burncoose.co.uk/site/pl ants.cfm?pl_id=1647">https://www.burncoose.co.uk/site/pl ants.cfm?pl_id=1647</a>
			Totals	26			7.99		378	
	Soft Fruit	Blackberry	Rueben	30	7/9	30	1	7.99	239.7	<a href="https://www.crocus.co.uk/plants/ /b lackberry-reuben/classid.20000181 00/">https://www.crocus.co.uk/plants/ /b lackberry-reuben/classid.20000181 00/</a>
		Grape	Precoce de Malingre	12		30	2.5	7.15	85.8	<a href="https://www.agroforestry.co.uk/pro duct/grape-vitis-precoces-de-maling re/">https://www.agroforestry.co.uk/pro duct/grape-vitis-precoces-de-maling re/</a>
		Raspberry	Autumn Bliss	50		20	0.4	1	50	<a href="https://walcotnursery.co.uk/product/autumn-bliss/">https://walcotnursery.co.uk/product/autumn-bliss/</a>
			Totals			80	16.25		375.5	
Block 6	Top Fruit	Apple	Egremont russet	2	21/9		3	16.25	32.5	<a href="https://walcotnursery.co.uk/product/egremont-russet/">https://walcotnursery.co.uk/product/egremont-russet/</a>
		Apple	Red Pippin	4	21/9		3	16.25	65	<a href="https://walcotnursery.co.uk/product/fiesta/">https://walcotnursery.co.uk/product/fiesta/</a>
		Pear	Concorde	4	21/9		3	10	40	<a href="https://walcotnursery.co.uk/product/concorde/">https://walcotnursery.co.uk/product/concorde/</a>
		Pear	Louise Bonne of Jersey	4	21/9		3	17.25	69	<a href="https://walcotnursery.co.uk/product/louise-bonne-jersey/">https://walcotnursery.co.uk/product/louise-bonne-jersey/</a>
		Crataegus ellwangeriana	=	2	21/9		3	16	32	<a href="https://www.agroforestry.co.uk/pro duct/haw-crataegus-ellwangeriana/">https://www.agroforestry.co.uk/pro duct/haw-crataegus-ellwangeriana/</a>
		Cornus kousa Chinensis	=	2	21/9		3	8.5	17	<a href="https://www.agroforestry.co.uk/pro duct/cornus-kousa-chinensis/">https://www.agroforestry.co.uk/pro duct/cornus-kousa-chinensis/</a>
									0	
		N.Fixers		8					0	
			Totals	26			12.5		255.5	
	Soft Fruit	Kiwi	anna	8		40	5	12.5	100	<a href="https://www.agroforestry.co.uk/pro duct/kiwi-actinidia-arguta-anna/">https://www.agroforestry.co.uk/pro duct/kiwi-actinidia-arguta-anna/</a>
		Grape	Kempsey Black	16		40	2.5	7.15	114.4	<a href="https://www.agroforestry.co.uk/pro duct/grape-vitis-kempsey-black/">https://www.agroforestry.co.uk/pro duct/grape-vitis-kempsey-black/</a>
			Totals			80	17.25		214.4	
Block 7	Top Fruit	Pear	Beurre Hardy	4	5/10		3	17.25	69	<a href="https://walcotnursery.co.uk/product/beurre-hardy/">https://walcotnursery.co.uk/product/beurre-hardy/</a>
		Pear	Doyenne du Comice	4	5/10		3	17.25	69	<a href="https://walcotnursery.co.uk/product/doyenne-du-comice/">https://walcotnursery.co.uk/product/doyenne-du-comice/</a>
		Apple	Kids orange red	4	5/10		3	16.25	65	<a href="https://walcotnursery.co.uk/product/kids-orange-red/">https://walcotnursery.co.uk/product/kids-orange-red/</a>
		Apple	Red Falstaff	4	5/10		3	16.25	65	<a href="https://walcotnursery.co.uk/product/red-falstaff/">https://walcotnursery.co.uk/product/red-falstaff/</a>
		Quince	Krymsk	2	12/10		3	18.5	37	<a href="https://walcotnursery.co.uk/product/krymsk/">https://walcotnursery.co.uk/product/krymsk/</a>







Mixed fruit silvohorticulture.

3 rows of 210m @ 3m spacings = 210 trees.



		Species	Variety	Quantity	Harvest Beginning	Length of row	Spacing (m)	Cost per unit	Subtotal	Source
ROW 1 < 27/7	Top Fruit	Prunus Avium (Cherry)	Lapins	8	29/6	24	3	12	96	<a href="https://walcotnursery.co.uk/product/lapins/">https://walcotnursery.co.uk/product/lapins/</a>
		Prunus Avium (Cherry)	Stella	8	13/7	24	3	12	96	<a href="https://walcotnursery.co.uk/product/stella/">https://walcotnursery.co.uk/product/stella/</a>
		Prunus Domestica (Plum)	Opal	6	13/7	18	3	18.5	111	<a href="https://walcotnursery.co.uk/product/opal/">https://walcotnursery.co.uk/product/opal/</a>
		Prunus Avium (Cherry)	Sunburst	8	27/7	24	3	12	96	<a href="https://walcotnursery.co.uk/product/sunburst/">https://walcotnursery.co.uk/product/sunburst/</a>
		Prunus domestica (Plum)	Early prolific	8	27/7	24	3	18.5	148	<a href="https://walcotnursery.co.uk/product/early-prolific/">https://walcotnursery.co.uk/product/early-prolific/</a>
		Prunus armenica (Apricot)	Tomcot	6	28/7	18	3	25	150	<a href="https://www.frankpmatthews.com/catalogue/apricot/10023">https://www.frankpmatthews.com/catalogue/apricot/10023</a>
		Prunus cerasifera (Mirabelle)	golden sphere	4	3/8	12	3	18.95	75.8	<a href="https://www.orangepippintrees.co.uk/mirabelle-trees/golden-sphere">https://www.orangepippintrees.co.uk/mirabelle-trees/golden-sphere</a>
		Alnus glutinosa		22	-	66	3	0.44	9.68	<a href="http://www.treesplease.co.uk/product/alnus-glutinosa/">http://www.treesplease.co.uk/product/alnus-glutinosa/</a>
			Totals	70		210			782.48	
	Soft Fruit	Raspberry	Glen Ample	125	22/6	50	0.4	1	125	<a href="https://walcotnursery.co.uk/product/glen-ample/">https://walcotnursery.co.uk/product/glen-ample/</a>
		Honeyberry	-	20	22/6	30	1.5	10	200	<a href="https://www.frankpmatthews.com/catalogue/honeysuckle/11661">https://www.frankpmatthews.com/catalogue/honeysuckle/11661</a>
		Chuckleberry	-	8	22/6	10	1.2	7.25	58	<a href="https://walcotnursery.co.uk/product-category/fruit-bushes/chuckleberry/">https://walcotnursery.co.uk/product-category/fruit-bushes/chuckleberry/</a>
		Saskatoon	-	13	6/7	20	1.5	10	130	Pershire juneberries? <a href="https://www.frankpmatthews.com/catalogue/saskatoon/12200">https://www.frankpmatthews.com/catalogue/saskatoon/12200</a>



		Blackcurrant	Ben Hope	42	13/7	50	1.2	7.25	304.5	<a href="https://walcotnursery.co.uk/product-category/fruit-bushes/blackcurrant/">https://walcotnursery.co.uk/product-category/fruit-bushes/blackcurrant/</a>
		Jostaberry		13	13/7	20	1.5	6	78	<a href="https://www.agroforestry.co.uk/product/jostaberry-ribes%C2%85/">https://www.agroforestry.co.uk/product/jostaberry-ribes%C2%85/</a>
		Tayberry		10	13/7	10	1	7.25	72.5	<a href="https://walcotnursery.co.uk/product/tayberry/">https://walcotnursery.co.uk/product/tayberry/</a>
		Gooseberry	Hinnomaki Red	10	20/7	20	1.2	7.25	72.5	<a href="https://walcotnursery.co.uk/product/hinnonmaki-red/">https://walcotnursery.co.uk/product/hinnonmaki-red/</a>
			Totals	241		210			1040.5	
ROW 2 3/8 - 7/9	Top Fruit	Peach	Avalon Pride	4	10/8	12	3	30	120	<a href="https://www.frankpmatthews.com/catalogue/peach/11501">https://www.frankpmatthews.com/catalogue/peach/11501</a>
		Prunus avium (Cherry)	Penny	10	10/8	30	3	19.5	195	<a href="https://walcotnursery.co.uk/product/penny-r/">https://walcotnursery.co.uk/product/penny-r/</a>
		Apricot	Goldcot	4	10/8	12	3	30	120	<a href="https://www.frankpmatthews.com/catalogue/apricot/10022">https://www.frankpmatthews.com/catalogue/apricot/10022</a>
		Prunus domestica (Plum)	Pershire emblem	10	17/8	30	3	18.5	185	<a href="https://walcotnursery.co.uk/product/pershire-emblem/">https://walcotnursery.co.uk/product/pershire-emblem/</a>
		Pear	Beth	10	24/8	30	3	17.25	172.5	<a href="https://walcotnursery.co.uk/product/beth/">https://walcotnursery.co.uk/product/beth/</a>
		Mirabelle	Mirabelle de nancy	4	31/8	12	3	18.95	75.8	<a href="https://www.orangepippintrees.co.uk/mirabelle-trees/mirabelle-de-nancy">https://www.orangepippintrees.co.uk/mirabelle-trees/mirabelle-de-nancy</a>
		Gage	Coe's golden drop	6	7/9	18	3	18.5	111	<a href="https://walcotnursery.co.uk/product/coes-golden-drop/">https://walcotnursery.co.uk/product/coes-golden-drop/</a>
		NF - Psuedoacacia robinia		22	-	66	3	0.9	19.8	<a href="http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0">http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0</a>
			Totals	70		210			868.3	
	Soft Fruit	Loganberry		10	20/7	10	1	7.25	72.5	<a href="https://walcotnursery.co.uk/product/loganberry/">https://walcotnursery.co.uk/product/loganberry/</a>
		Blackberry	Waldo	67	10/8	50	0.75	7.25	485.75	<a href="https://walcotnursery.co.uk/product/waldo/">https://walcotnursery.co.uk/product/waldo/</a>
		White currant	Blanka	13.3333333333	10/8	20	1.5	6	80	<a href="https://www.agroforestry.co.uk/product/whitecurrant-ribes-rubrum-blanka/">https://www.agroforestry.co.uk/product/whitecurrant-ribes-rubrum-blanka/</a>
		Blackberry	Waldo	67	10/8	50	0.75	7.25	485.75	<a href="https://walcotnursery.co.uk/product/waldo/">https://walcotnursery.co.uk/product/waldo/</a>
		Raspberry	Autumn Bliss	125	31/8	50	0.4	1	125	<a href="https://walcotnursery.co.uk/product/autumn-bliss/">https://walcotnursery.co.uk/product/autumn-bliss/</a>
		Actinidia arguta	Scarlet September	6	7/9	30	5	12.5	75	<a href="https://www.agroforestry.co.uk/product/kiwi-actinidia-arguta-scarlet-september/">https://www.agroforestry.co.uk/product/kiwi-actinidia-arguta-scarlet-september/</a>
		Actinidia arguta	Weiki male	1		0	0	12.5	12.5	<a href="https://www.agroforestry.co.uk/product/kiwi-actinidia-arguta-weiki-male/">https://www.agroforestry.co.uk/product/kiwi-actinidia-arguta-weiki-male/</a>
			Totals			210			1336.5	
ROW 3 14/9 >	Top Fruit	Apple	May Queen	20	19/10	60	3	16.25	325	<a href="https://walcotnursery.co.uk/product/may-queen/">https://walcotnursery.co.uk/product/may-queen/</a>
		Pear	Doyenne du Comice	10	5/10	30	3	17.25	172.5	<a href="https://walcotnursery.co.uk/product/doyenne-du-comice/">https://walcotnursery.co.uk/product/doyenne-du-comice/</a>
		Pear	Beurre Hardy	10	5/10	30	3	17.25	172.5	<a href="https://walcotnursery.co.uk/product/beurre-hardy/">https://walcotnursery.co.uk/product/beurre-hardy/</a>
		Crataegus ellwangeriana	-	2	21/9	6	3	16	32	<a href="https://www.agroforestry.co.uk/product/haw-crataegus-ellwangeriana/">https://www.agroforestry.co.uk/product/haw-crataegus-ellwangeriana/</a>
		Crataegus Arnoldiana	-	2	22/9	6	3	16	32	<a href="https://www.agroforestry.co.uk/product/haw-crataegus-arnoldiana/">https://www.agroforestry.co.uk/product/haw-crataegus-arnoldiana/</a>
		Diospyros virginiana		2	19/10	6	3	24	48	<a href="https://www.agroforestry.co.uk/product-category/plants/top-fruit/persimmons/">https://www.agroforestry.co.uk/product-category/plants/top-fruit/persimmons/</a>

		Cornus kousa Chinensis	-	2	21/9	6	3	8.5	17	<a href="https://www.agroforestry.co.uk/product/cornus-kousa-chinensis/">https://www.agroforestry.co.uk/product/cornus-kousa-chinensis/</a>	
		NF - Psuedoacacia robinia		22	-	66	3	0.9	19.8	<a href="http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0">http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0</a>	
			Totals	70		210			782		
	Soft Fruit	Raspberry	Autumn Bliss	200	31/8	80	0.4	1	200	<a href="https://walcotnursery.co.uk/product/autumn-bliss/">https://walcotnursery.co.uk/product/autumn-bliss/</a>	
		Kiwi	anna	13	28/9	65	5	12.5	162.5	<a href="https://www.agroforestry.co.uk/product/kiwi-actinidia-arguta-anna/">https://www.agroforestry.co.uk/product/kiwi-actinidia-arguta-anna/</a>	
		Grape	Kempsey Black	26	5/10	65	2.5	7.15	185.9	<a href="https://www.agroforestry.co.uk/product/grape-vitis-kempsey-black/">https://www.agroforestry.co.uk/product/grape-vitis-kempsey-black/</a>	
			Totals			210			548.4		
	TOTAL									4809.78	

Avenue Plantings & Extra Windbreaks.



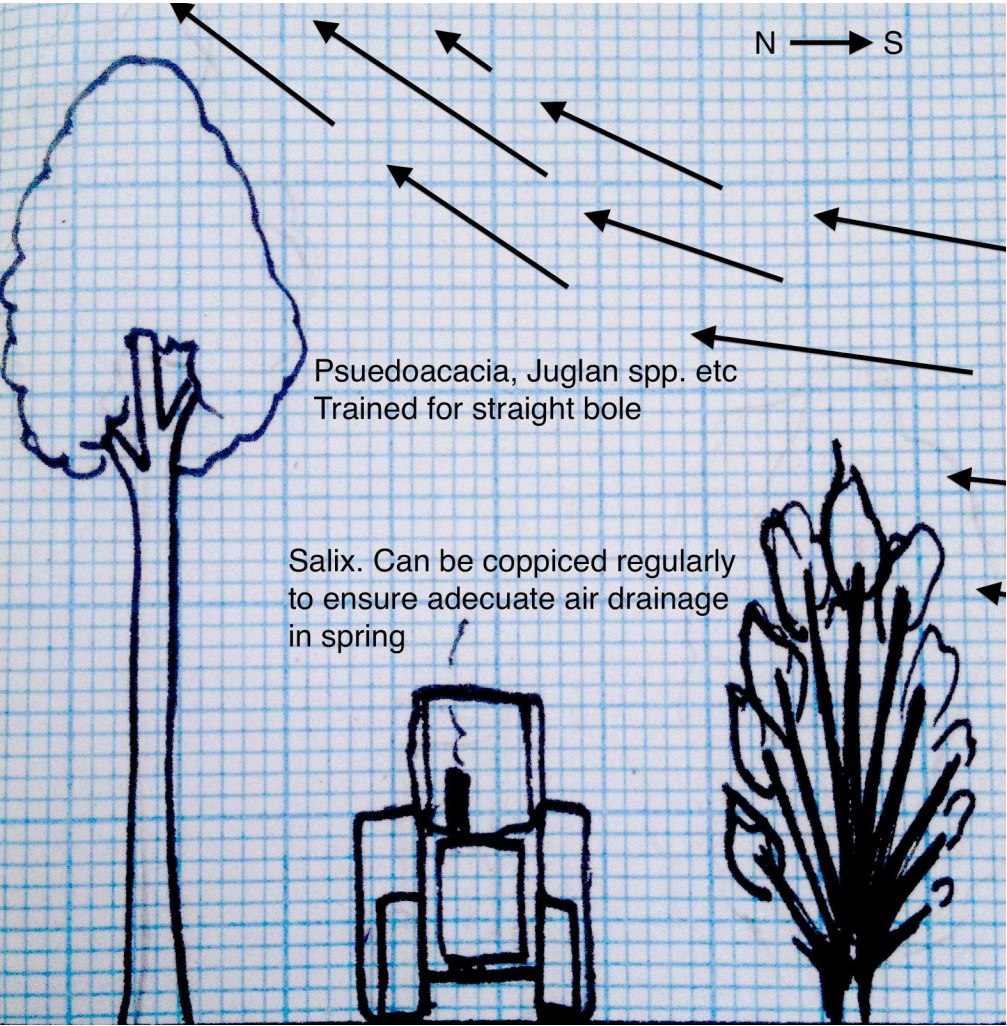
A. 106m of supplementary windbreaks. 2 rows @ 1.2m spacings = 353 trees.

supplementary windbreaks	Hippophae rhamnoides (Sea Buckthorn)	350	0.47	164.5	<a href="http://www.britishhardwood.co.uk/hippophae-rhamnoides-sea-buckthorn/100/">http://www.britishhardwood.co.uk/hippophae-rhamnoides-sea-buckthorn/100/</a>
	totals	350		164.5	

B. 980m Avenue planting. Single row @ 1m spacings = 980 trees.

Avenue Planting	Psuedoacacia robinia	250	0.9	225	<a href="http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0">http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0</a>
	Juglan nigra	250	1.09	272.5	<a href="http://www.britishhardwood.co.uk/juglans-nigra-black-walnut/138/">http://www.britishhardwood.co.uk/juglans-nigra-black-walnut/138/</a>
	Salix viminalis hybrid	500	0.38	190	<a href="https://mammothwillow.co.uk/shop/index.php?main_page=product_info&amp;cPath=53_21&amp;products_id=89">https://mammothwillow.co.uk/shop/index.php?main_page=product_info&amp;cPath=53_21&amp;products_id=89</a>
				687.5	





Mixed Use Alley Plantings



Rows 1-4: Hawberries & support species @ 3m spacings. 32 trees  
Rows 1-4: Hazelnuts & support species @ 2m spacings 48 trees  
Rows 9-20: Biomass, Timber & Wood fuel. 416 trees

	Species	Variety	Quantity	Harvest Beginning	Length of row	Spacing (m)	Cost per unit	Subtotal	Source
Row 1	Crataegus Arnoldiana	-	5	-		3	16	80	<a href="https://www.agroforestry.co.uk/product/haw-crataegus-arnoldiana/">https://www.agroforestry.co.uk/product/haw-crataegus-arnoldiana/</a>
	NF - Psuedoacacia robinia		3	-		3	0.9	2.7	<a href="http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0">http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0</a>
		Totals	8		24			82.7	



Row 2	Crataegus ellwangeriana	-	5	-		3	16	80	<a href="https://www.agroforestry.co.uk/product/haw-crataegus-ellwangeriana/">https://www.agroforestry.co.uk/product/haw-crataegus-ellwangeriana/</a>
	NF - Psuedoacacia robinia		3	-		3	0.9	2.7	<a href="http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0">http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0</a>
	Totals		8		24			82.7	
Row 3	Crataegus schraderiana	-	5	-		3	16	80	<a href="https://www.agroforestry.co.uk/product/haw-crataegus-schraderiana/">https://www.agroforestry.co.uk/product/haw-crataegus-schraderiana/</a>
	NF - Psuedoacacia robinia		3	-		3	0.9	2.7	<a href="http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0">http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0</a>
	Totals		8		24			82.7	
Row 4	Crataegus durobrivensis	-	5	-		3	16	80	<a href="https://www.agroforestry.co.uk/product/haw-crataegus-durobrivensis/">https://www.agroforestry.co.uk/product/haw-crataegus-durobrivensis/</a>
	NF - Psuedoacacia robinia		3	-		3	0.9	2.7	<a href="http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0">http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0</a>
	Totals		8		24			82.7	
Row 5	NF - Psuedoacacia robinia		4	-		2	0.9	3.6	<a href="http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0">http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0</a>
	Corylus avellana		8			2	0	0	Home Prop
	Totals		12		24			3.6	
Row 6	NF - Psuedoacacia robinia		4	-		2	0.9	3.6	<a href="http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0">http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0</a>
	Corylus avellana		8			2	0	0	Home Prop
	Totals		12		24			3.6	
Row 7	NF - Psuedoacacia robinia		4	-		2	0.9	3.6	<a href="http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0">http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0</a>
	Corylus avellana		8			2	0	0	Home Prop
	Totals		12		24			3.6	
Row 8	NF - Psuedoacacia robinia		4	-		2	0.9	3.6	<a href="http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0">http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0</a>
	Corylus avellana		8			2	0	0	Home Prop
	Totals		12		24			3.6	
Row 9	Salix viminalis hybrid		12		12	1	0.35	4.2	<a href="https://www.bowhayestrees.co.uk/willow-trees.html">https://www.bowhayestrees.co.uk/willow-trees.html</a>
	Populus hybrid		12		12	1	0.35	4.2	<a href="https://www.bowhayestrees.co.uk/willow-trees.html">https://www.bowhayestrees.co.uk/willow-trees.html</a>
	Totals		24		24			8.4	
Row 10	Salix viminalis hybrid		25		25	1	0.35	8.75	<a href="https://www.bowhayestrees.co.uk/willow-trees.html">https://www.bowhayestrees.co.uk/willow-trees.html</a>
	Populus hybrid		25		25	1	0.35	8.75	<a href="https://www.bowhayestrees.co.uk/willow-trees.html">https://www.bowhayestrees.co.uk/willow-trees.html</a>
	Totals		50		50			17.5	



Row 11	Salix viminalis hybrid		18.5		18.5	1	0.35	6.475	<a href="https://www.bowhayestrees.co.uk/willow-trees.html">https://www.bowhayestrees.co.uk/willow-trees.html</a>
	Populus hybrid		18.5		18.5	1	0.35	6.475	<a href="https://www.bowhayestrees.co.uk/willow-trees.html">https://www.bowhayestrees.co.uk/willow-trees.html</a>
	Totals		37		37			12.95	
Row 12	Salix viminalis hybrid		26		26	1	0.35	9.1	<a href="https://www.bowhayestrees.co.uk/willow-trees.html">https://www.bowhayestrees.co.uk/willow-trees.html</a>
	Populus hybrid		26		26	1	0.35	9.1	<a href="https://www.bowhayestrees.co.uk/willow-trees.html">https://www.bowhayestrees.co.uk/willow-trees.html</a>
	Totals		52		52			18.2	
Row 13	NF - Psuedoacacia robinia		9	-	26	3	0.9	8.1	<a href="http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0">http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0</a>
	Quercus robur (Oak)		4		11	3	0.32	1.28	<a href="http://www.britishhardwood.co.uk/quercus-robur-english-oak/157/">http://www.britishhardwood.co.uk/quercus-robur-english-oak/157/</a>
	Prunus avium (Wild Cherry)		7		20	3	0.31	2.17	<a href="http://www.britishhardwood.co.uk/prunus-avium-wild-cherry/151/">http://www.britishhardwood.co.uk/prunus-avium-wild-cherry/151/</a>
	Juglan nigra		7		20	3	1.09	7.63	<a href="http://www.britishhardwood.co.uk/juglans-nigra-black-walnut/138/">http://www.britishhardwood.co.uk/juglans-nigra-black-walnut/138/</a>
	Totals		27		77			19.18	
Row 14	Salix viminalis hybrid		33		33	1	0.35	11.55	<a href="https://www.bowhayestrees.co.uk/willow-trees.html">https://www.bowhayestrees.co.uk/willow-trees.html</a>
	Populus hybrid		33		33	1	0.35	11.55	<a href="https://www.bowhayestrees.co.uk/willow-trees.html">https://www.bowhayestrees.co.uk/willow-trees.html</a>
	Totals		66		66			23.1	
Row 15	NF - Psuedoacacia robinia		7	-	20	3	0.9	6.3	<a href="http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0">http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0</a>
	Quercus robur (Oak)		2		7	3	0.32	0.64	<a href="http://www.britishhardwood.co.uk/quercus-robur-english-oak/157/">http://www.britishhardwood.co.uk/quercus-robur-english-oak/157/</a>
	Fagus sylvatica (Beech)		5		16	3	0.38	1.9	<a href="http://www.britishhardwood.co.uk/fagus-sylvatica-green-beech/136/">http://www.britishhardwood.co.uk/fagus-sylvatica-green-beech/136/</a>
	Juglan nigra		5		16	3	1.09	5.45	<a href="http://www.britishhardwood.co.uk/juglans-nigra-black-walnut/138/">http://www.britishhardwood.co.uk/juglans-nigra-black-walnut/138/</a>
	Totals		19		59			14.29	
Row 16	Salix viminalis hybrid		28		28	1	0.35	9.8	<a href="https://www.bowhayestrees.co.uk/willow-trees.html">https://www.bowhayestrees.co.uk/willow-trees.html</a>
	Populus hybrid		28		28	1	0.35	9.8	<a href="https://www.bowhayestrees.co.uk/willow-trees.html">https://www.bowhayestrees.co.uk/willow-trees.html</a>
	Totals		56		56			19.6	
Row 17	NF - Psuedoacacia robinia		5	-	16	3	0.9	4.5	<a href="http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0">http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0</a>
	Quercus robur (Oak)		1		4	3	0.32	0.32	<a href="http://www.britishhardwood.co.uk/quercus-robur-english-oak/157/">http://www.britishhardwood.co.uk/quercus-robur-english-oak/157/</a>
	Prunus avium (Wild Cherry)		4		12	3	0.31	1.24	<a href="http://www.britishhardwood.co.uk/prunus-avium-wild-cherry/151/">http://www.britishhardwood.co.uk/prunus-avium-wild-cherry/151/</a>
	Juglan nigra		5		16	3	1.09	5.45	<a href="http://www.britishhardwood.co.uk/juglans-nigra-black-walnut/138/">http://www.britishhardwood.co.uk/juglans-nigra-black-walnut/138/</a>
	Totals		15		48			11.51	
Row 18	Salix viminalis hybrid		20		20	1	0.35	7	<a href="https://www.bowhayestrees.co.uk/willow-trees.html">https://www.bowhayestrees.co.uk/willow-trees.html</a>
	Populus hybrid		20		20	1	0.35	7	<a href="https://www.bowhayestrees.co.uk/willow-trees.html">https://www.bowhayestrees.co.uk/willow-trees.html</a>
	Totals		40		40			14	
Row 19	NF - Psuedoacacia robinia		3	-	10	3	0.9	2.7	<a href="http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0">http://www.greenhills-nursery.co.uk/site/index.php/component/virtuemart/hedging-whips/bare-root-potgrown-hedging/robinia-pseudoacacia-detail?Itemid=0</a>

									<a href="#">dging/robinia-pseudoacacia-detail?ltemid=0</a>
	Quercus robur (Oak)		1		3	3	0.32	0.32	<a href="http://www.britishhardwood.co.uk/quercus-robur-english-oak/157/">http://www.britishhardwood.co.uk/quercus-robur-english-oak/157/</a>
	Fagus sylvatica (Beech)		3		9	3	0.38	1.14	<a href="http://www.britishhardwood.co.uk/fagus-sylvatica-green-beech/136/">http://www.britishhardwood.co.uk/fagus-sylvatica-green-beech/136/</a>
	Juglan nigra		3		10	3	1.09	3.27	<a href="http://www.britishhardwood.co.uk/juglans-nigra-black-walnut/138/">http://www.britishhardwood.co.uk/juglans-nigra-black-walnut/138/</a>
	Totals		10		32			7.43	
Row 20	Salix viminalis hybrid		10		10	1	0.35	3.5	<a href="https://www.bowhayestrees.co.uk/willow-trees.html">https://www.bowhayestrees.co.uk/willow-trees.html</a>
	Populus hybrid		10		10	1	0.35	3.5	<a href="https://www.bowhayestrees.co.uk/willow-trees.html">https://www.bowhayestrees.co.uk/willow-trees.html</a>
	Totals		20		20			7	
	Trees:		496				Total:	518.36	

Tree Totals

10,685m of rows

Investment	Trees Needed	Cost
Hedging	9500	2990
Windbreaks	3600	1566
Nut Plantings	234	6275
Fuel, biomass, timber & fodder trees in flood meadow pastures	912	378
Mixed Fruit Silvopasture (Includes fruit bushes	214	5495.6
Mixed Fruit Silviohorticulture (Includes fruit bushes)	210	4809.78
Avenue Plantings & Extra Windbreaks	1333	852
Mixed Use Alley Plantings	496	518.36
Totals	16499	22884.74

Implementation & Infrastructure

Marking out

Rows will be marked out with a handheld GPS and trued via triangulation. Keyline patterning will be trued with a laser level.

Ground Preparation

After the agroforestry plantings have been marked out lanes will be passed with a subsoil plow to loosen subsoil. A strip approximately 1.5m wide will then be ploughed, followed by a pass with a 1.5m power harrow. We will need to hire or borrow a subsoil plough.

Mulching

Tilled lanes will be mulched with either with municipal green waste compost of anaerobic digestate. Ideally this would be applied with the aid of a side discharge spreader (<http://npseymour.co.uk/machinery/side-discharge-spreader-2/>). We will try to locate one of these on a local organic orchard and hire it for a week if possible & also a mini digger to load it. Failing this we would need to use the same technique we use for laying no-dig beds. This involves reversing a tractor with link box into a pile of compost, then driving over the lane followed by 1 or 2 people with rakes pulling compost into the lane. With one person driving & one raking we can lay around 75m/hr at around 15cm deep. This would amount to roughly 284 person hours over the whole 10,685m of rows.



Compost budget: 10,685m x 0.8m x 0.1m = 854m3 or 850,000l

This could be reduced drastically by marking tree positions & only applying compost to the 1m2 around that position. This would also drastically reduce person hours of mulch application if using the latter method. We could also omit this step from the biomass/windbreak plantings of willow, and perhaps the hedging. This would leave approximately 3400 trees. If each tree recieved 0.8m x 0.8m x 0.1m compost this would amount to 100l a tree, or 340,000l total. This could be reduced a further 20% by only mulching 0.8m x 0.8m. This leaves a remaining compost budget of roughly 270,000litres. When we bought the greenwaste compost for our no dig beds we had around 150,000l delivered for roughly £600. With this in mind we will budget £1200 for compost.

This will be followed by a biodegradable mulch fabric Ecotex Mulch Mat. This comes on 100m x 1m rolls & we’ve been quoted £1.37/m2 delivered. This supposedly takes between 3 to 5 years to break down leaving no synthetic residue.



The hedgerows, windbreaks, fruit trees & biomass alleys will need a continuous layer, but the timber plantings would only need a 1m x 1m square. Also, the rows that are being planted into our existing no dig will not require this. This would leave approximately 9,357m2 of mulch fabric, or 94 rolls, £12,878.

There would also be a significant reduction in cost if we omitted this from the hedgerows. This may have an effect on the rate of establishment but would reduce this by 23 rolls. This would reduce the investment to £9,727.

Planting

Bare root trees will be planted through crosses cut in the mulch fabric. Tilled, mulched soil beneath should be loose enough to facilitate planting by hand. Before planting roots will be soaked in a dilution of sugarcane molasses & seaweed extract, then dipped in a mycorrhizal inoculant.

Protection

Pest pressures will be present in the form of deer (Roe, Muntjac), rabbits, voles & squirrels. Protection options include a large range of individual protections though on a planting scheme of this scale this will amount to a significant investment. These do though have the benefit of providing a beneficial microclimate during the first few years of establishment, although can also restrict plant physiology.

Tubex tree shelters	1.24	16500	20460	<a href="http://www.britishhardwood.co.uk/tubex-tree-shelters/206/">http://www.britishhardwood.co.uk/tubex-tree-shelters/206/</a>
Stakes	0.39	16500	6435	<a href="http://www.britishhardwood.co.uk/tubex-tree-shelters/206/">http://www.britishhardwood.co.uk/tubex-tree-shelters/206/</a>
		Total	26895	

Alternatively we could use deer mesh netting to fence the entire site. This has many benefits including being much more economical, not restricting plant physiology (especially in fruit trees) whilst also reducing deer pressure on horticultural crops. Low cost gates can be obtained in the form of heras fencing panels. Trees will need the added protection of a spiral rabbit guard.

Vole	Spiral Guard
Rabbit	Spiral Guard
Squirrel	Spiral Guard
Deer	1.8m Mesh Fence

Protection	Deer fence mesh	24	138.85	3332.4	<a href="https://www.farmforestry.co.uk/fencing/deer-fencing/plastic-mesh-deer-fencing-extra-strong">https://www.farmforestry.co.uk/fencing/deer-fencing/plastic-mesh-deer-fencing-extra-strong</a>
	Deer fence stakes	1.2	625	750	<a href="http://www.hartwellfencing.co.uk/ranges/timber/5075peeledstake/">http://www.hartwellfencing.co.uk/ranges/timber/5075peeledstake/</a>
	Spiral Guard	0.17	16500	2805	<a href="http://www.britishhardwood.co.uk/spiral-guards/210/">http://www.britishhardwood.co.uk/spiral-guards/210/</a>

	Heras Fence Panels (Gates)	4	15	60	<a href="https://www.ebay.co.uk/itm/Heras-Temporary-Fencing-Panels-Sit-e-security-Used/292449139554?hash=item441753bb62:g:mXsAAOSw1GlaWmt1">https://www.ebay.co.uk/itm/Heras-Temporary-Fencing-Panels-Sit e-security-Used/292449139554?hash=item441753bb62:g:mXsAAOSw1GlaWmt1</a>
			Total	6887.4	

Totals:

Marking out	Marking flags x 100	1	15	15	<a href="https://www.sccssurvey.co.uk/wire-flag-marks.html">https://www.sccssurvey.co.uk/wire-flag-marks.html</a>
	Lazer Level Hire week	1	115	115	<a href="https://www.hss.com/hire/c/surveying-and-location/lasers-and-levels">https://www.hss.com/hire/c/surveying-and-location/lasers-and-level s</a>
Ground Preparation	Hire of tractor, driver & subsoiler per hour	6	40	240	
Mulching	Compost (delivered)			1200	
	Ecotex Mulch Matt 1m2	9400	1.37	12878	
	Maxicrop 10l	1	21.96	21.96	<a href="https://www.progreen.co.uk/maxicrop-moss-killer-lawn-tonic-10-l?gclid=Cj0KCQiA_ITUBRD4ARIsAL7_VeVutQyVal6O9CiuNRsRnIkC3egCS2iVfAj6y1qoe_OnaGAVnX5HhcaAoCXEALw_wcB">https://www.progreen.co.uk/maxicrop-moss-killer-lawn-tonic-10-l?gclid=Cj0KCQiA_ITUBRD4ARIsAL7_VeVutQyVal6O9CiuNRsRnIkC3egCS2iVfAj6y1qoe_OnaGAVnX5HhcaAoCXEALw_wcB</a>
	Rootgrow mycorrhizae 2.5l	10	41.65	416.5	<a href="http://www.britishhardwood.co.uk/rootgrow-mycorrhizal-fungi/241/">http://www.britishhardwood.co.uk/rootgrow-mycorrhizal-fungi/241/</a>
	Sugarcane mollasses	1	17.49	17.49	<a href="https://www.ebay.co.uk/itm/Molasses-cane-7kg-organic-fertiliser-Enriched-with-minerals-Developed-in-UK-/112765988368?_trksid=p2385738.m4383.l4275.c10">https://www.ebay.co.uk/itm/Molasses-cane-7kg-organic-fertiliser-Enriched-with-minerals-Developed-in-UK-/112765988368?_trksid=p2385738.m4383.l4275.c10</a>
Protection	Deer fence mesh	24	113.85	2732.4	<a href="http://www.britishhardwood.co.uk/deer-fencing-mesh-rolls/248/">http://www.britishhardwood.co.uk/deer-fencing-mesh-rolls/248/</a>
	Deer fence stakes	1.2	625	750	<a href="http://www.britishhardwood.co.uk/spiral-guards/210/">http://www.britishhardwood.co.uk/spiral-guards/210/</a>
	Spiral Guard	0.17	16500	2805	
			Total	21191.35	

# Financial Planning

Trees	16500	22884.74
Establishment		21191
	Total	44075.74

## Bringing costs down further

There are a few key points of leverage where the investment could be brought down significantly. Firstly the prices listed from Walcott Nursery are retail prices. Kevin O'neil who runs Walcott is a friend of the farm and excellent nurseryman he usually gives us a generous discount on purchases.

Alternatively there is potential for a massive reduction in costs of production trees by propagating the 'standards' (Prunus, Pyrus, Malus) either in nursery beds or in the field. Another fantastic local nursery Frank P. Mathews provide rootstock & graftwood at very reasonable rates when ordering in quantities of 100+. Below is a spreadsheet costing roughly the propagation materials for the proposed plantings allowing 60%+ for faliures.

Fruit Tree Propagation			
M106	200	0.8	160
Colt	100	0.98	98
Gielsa 5	100	1.85	185
St Julien A	200	0.98	196
Quince A	200	0.88	176
			815
Graftwood	800	0.82	656



		Total Investment	1471
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Species	Rootstock	Cultivar	Fruiting period	Quantity	Scion Source
Cherry	Colt	Colney	Late July		Kevin
		Black Oliver	Early August		Kevin
		Merchant	Early July		Kevin
		Penny	Early August		Kevin
		Stella	Mid July		Kevin
		Sunburst	Mid July		Kevin
		Lapins	Late June		Kevin
	Gielsa 5	Colney	Late July		Kevin
		Black Oliver	Early August		Kevin
		Merchant	Early July		Kevin
		Penny	Early August		Kevin
		Stella	Mid July		Kevin
		Sunburst	Mid July		Kevin
		Lapins	Late June		Kevin
Plum	St. Julien A	Early Prolific	Late July		Kevin
		Grove's Late Victoria	late August / early September		Kevin
		Herman	mid July		Kevin
		Kirke's Blue	early/mid September		Kevin
		Opal	early August		Kevin
		Sanctus Hubertus	late July		Kevin
		Warwickshire Drooper	early September		Kevin
		Yellow Egg	early / mid August		Kevin
Gage	St. Julien A	Cambridge Gage	mid August		Kevin
		Coe's Golden Drop	mid September		Kevin
		Count Althan's Gage	mid August		Kevin
		Jefferson's Gage	late August		Kevin
Pear	Quince A	Beurre Hardy	mid September		Kevin
		Beurre Superfin	Late September		Kevin
		Concorde	late September		Kevin
		Conference	late September		Kevin
		Doyenne du Comice	early October		Kevin
		Louise Bonne of Jersey	late September		Kevin
		Merton Pride	mid September		Kevin
		Onward	mid September		Kevin
Quince	Quince A	Vranja	late October.		Kevin
		Krymsk	October		Kevin
Apricot	St. Julien A	BERGERON	August		GB
		BREDASE	August		GB
		GOLDRICH	July		GB
		HARLAYNE	August		GB
		LUIZET	Late July		GB
		MOORPARK	Late July		GB
		NEW LARGE EARLY	Late July		GB

		NOVI SAD			GB
		PAVIOT	Late July		GB
Peach	St. Julien A	PEREGRINE	Late August		GB
		CRESTHAVEN	Late August		GB
		HARNAS	Early August		GB
		REDHAVEN	Mid August		GB
Asian Pear	Quince A	HOSUI	Augus		GB
Apple					

This is also totally viable for Juglan & Castanea species.

Castenea	300	0.75	225
Juglan Regia	300	1.09	327
			552
Graftwood	600	1.25	750
		Total Investment	1302

\*we have a friend who is the gamekeeper for Lord Bond who has the largest collection of Juglan varieties in the world, and has given us permission to collect scion wood from his orchard! So we can potentially acquire all our graftwood for walnuts for free. He makes a good example of the effects of diet on mental health.

Juglan spp will need to be grafted with a hot pipe. 27°C is ideal.  
 If the funding application is unsuccessful this could be potentially scaled up with the surplus being sold at a high margin to fund the establishment costs of the rest of the scheme.

Fruit

Average cost of rootstock	1.01
Average cost of scion	0.3
50% Failure	0.5
Total	2.62
Rough price for bareroot fruit trees on ebay	15
Profit per tree	12.38
Tree sales per £10,000 profit	808

Nut

Average cost of rootstock	0.92
Average cost of scion	1
60% Failure	0.6
Total	3.2
Rough price for named nut trees on ebay	30
Profit per tree	26.8
Tree sales per £10,000 profit	373

Another area where a considerable saving could be made is propagation of soft fruits. Especially since we have much of the propagation material on farm.



Tree totals if propagating production trees in house.

Investment	Trees Needed	Cost
Hedging	9500	2990
Windbreaks	3600	1566
Nut Plantings	234	1302
Fuel, biomass, timber & fodder trees in flood meadow pastures	912	378
Mixed Fruit Plantings	214	5815.73
Avenue Plantings & Extra Windbreaks	1333	852
Mixed Use Alley Plantings	496	518.36
Totals	16289	13422.09

Totals investment using home propagation:

Trees	16500	13422.09
Establishment		21191
	Total	34613.09

# **Yield & Revenue Forecasts**

## **Biomass**

A Forestry Commission study ([https://www.forestry.gov.uk/PDF/fcpn7.pdf/\\$FILE/fcpn7.pdf](https://www.forestry.gov.uk/PDF/fcpn7.pdf/$FILE/fcpn7.pdf)) suggests that plantings of around 5000 stools/ha can yield 12.5odt/ha/year (oven dry tonnes per hectare per year) or around 2.5 oven dry kilos per stool a year. Much higher yields are recorded per hectare at higher densities but productivity per stool is reduced. I would expect yield of stools in our system to be at least as productive as the stools at 5000/ha systems as they benefit from the complementary conditions of single figure rows in diverse polycultures. I will use 2.5kg/stool/yr as a base for my projections, and also include another 100% on top for moisture of fresh woodchip, 5kg/stool/year. NOTE; Volume would be more useful as a basis for projections as the intended use is compost for no-dig market gardening, and the ratio of weight to volume can vary dramatically depending on moisture content, but i can't find this data.

2940 stool = 14,700kg of woodchip per year.

NOTE: We will be pollarding and chipping willow in the next couple of weeks and will collect data from which we can make volumetric predictions.

Compost requirements for maintenance of our no-dig market garden are roughly as follows.

Outdoors 24m x 1m beds @ 2cm per year = 500L/bed/2year. 120beds= 30,000L/year.

Indoors 24m x 0.7 @ 2cm per year = 360l/2year. 36 beds 6,480L/year

Total: 36,480L/year - This does not include footpaths.

## **Fruit**

In our experience fruit yields are extremely variable usually due to late frosts which are a limiting factor in fruit production. We are designing our fruit plantings to be complementary enterprises which will supplement our staples of market gardening and livestock. If a PYO market can be developed for fruits we would likely invest in frost protection in the form of either misters or air movement.

## **Nuts**

Chestnuts can yield 25kg/tree/year after 10 year. Walnuts yields can be between 15-50kg/tree/year between 10-20 years. If these results could be replicated our 71 chestnut trees could potentially be producing 1.775tonnes/year by 2030 and our 120 walnuts 1.8tonnes. This does not account for thinning which will be necessary if we don't want to lose pasture, although planting at this density allows us to get up to saleable quantity sooner and gives us more options in the future should grazing not prove to be a viable enterprise on our scale.

## **Hedge Laying**

The countryside stewardship scheme provides funding for hedgelaying. This comes in at £9.40/m which would amount to around to £21,500 for our 2287m of hedgerows. Even without this incentive hedgelaying will have inherent value in replacing degenerative infrastructure, though this funding would certainly bring it up the priority list & allow for the work to be contracted out if time is short.