TEXAS A&M UNIVERSITY

09 December 2022

Purple Orchard: Best Management Practices

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Hort 319 500 Dr. Hartmann

Group Members & Chosen Crops

Aliyah Abdur-Razzaaq- Mulberries

Emily Maresh- Plums

Location Market and Suppliers

Proposed Site: Latitude: 35.8126787 Longitude: -87.5663655

Proposed Site's Location: Centerville, Hickmann County, TN

The location chosen is Centerville, Tennessee, in Hickman County just outside of Nashville. The surrounding areas of our location is mainly farmland; the closest suppliers will be in nearby cities like Columbia. The main market would be in Centerville as well as the surrounding cities.

FIgure 1: *zoomed in map of selected location*

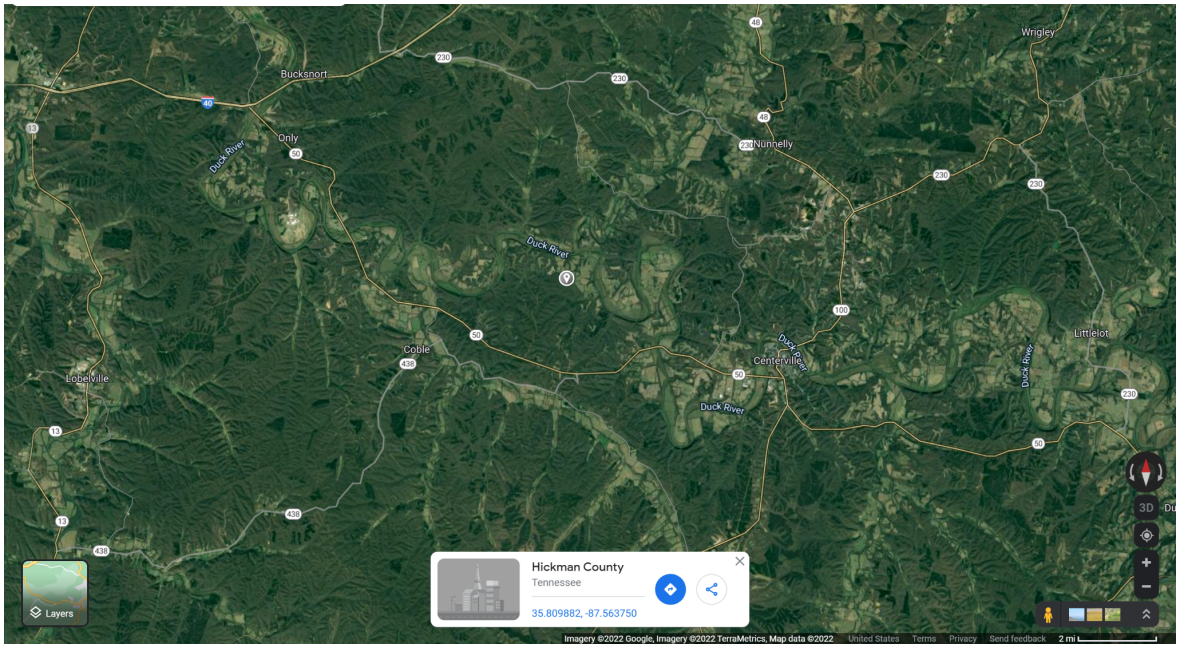

Figure 2: *zoomed out map of selected location*

Topography

Figure 3: *map of location of slopes on selected site*

The slope of our land is a 1%-5% slope (PaB), a 2%-5% slope (PkB) and a 15%-30% slope (BbD). The area around our planting site is very raised in the west. This could cause air drainage problems. It is flatter in the east however there is still more of a raised section than in the chosen planting area. This could cause a bowl effect.

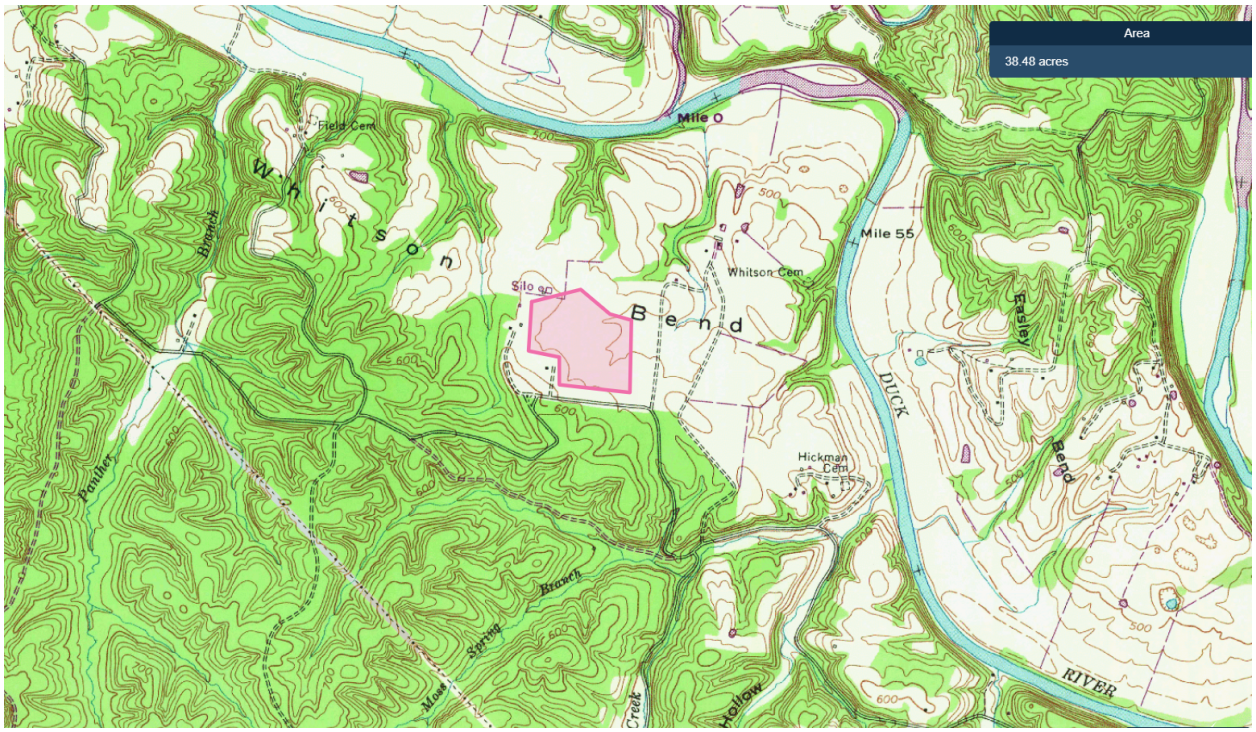

Figure 4: *topographical map of selected site*

Climate, Soil Analysis & Water Supply

10 years worth of climate data using the <45 chill model.

Year	Precipitation	Mean Temps	Temp Extremes ℉ (high)	Temp Extremes ℉ (low)	Chilling Hours	Hail per Year
2010	59.08	59.5	101 august	8 january	n/a	3 events 1in size
2011	52.14	60.4	102 august	7 february	n/a	1 event 1in size

2012	45.82	62.3	109 july	18 january	n/a	8 events .75-1.75in size
2013	54.88	59.3	97 july	16 november	1917	1 event .75in size
2014	50.59	58.9	97 august	2 january	2016	N/A
2015	50.80	61.2	97 august	9 march	1274	1 event 1in size
2016	42.73	62.7	98 june	12 january	1124	N/A
2017	52.92	62.4	98 july	8 january	1514	5 events 1in size
2018	58.94	61.7	99 july	5 january	1692	N/A
2019	64.27	62.5	99 october	18 march	1756	1 event 1in size
2020	47,97	61.8	97 august	17 february	1787	1 event .88in size
2021	59.32	61.8	98 august	11 february	1628	1 event 1.25in size
Average	53.29	61.21	99.33	10.92	1634.22	1.83 events

Table 1: *table with data of previous chilling and precipitation events*

Soil analysis: depth of each horizon:

H1 - 0 to 6 inches: silt loam

H2 - 6 to 25 inches: silt loam

H3 - 25 to 41 inches: silt loam

H4 - 41 to 60 inches: clay loam

top/subsoil texture: silt loam

pH: 5 up until 25 inches down.

drainage class: moderately well drained

organic matter: 1-2% organic matter

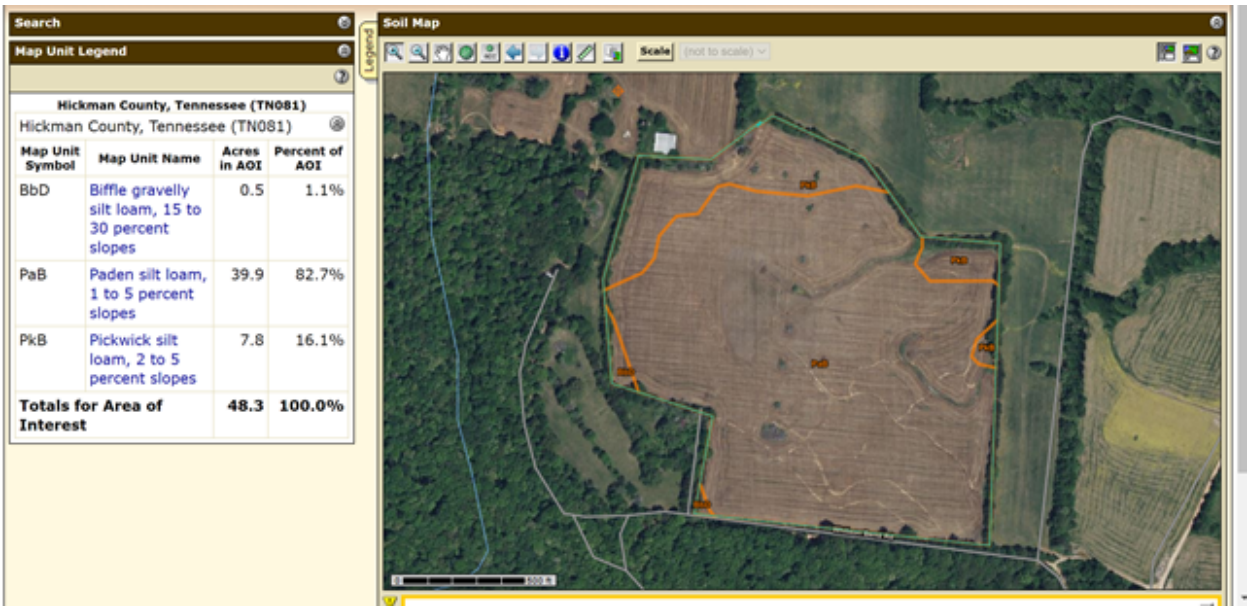

Figure 5: *map of the different soil types and their location on site*

Description of water supply

Our water will be sourced from a well with an irrigation depth of at least 2 feet. The assumed pH is 6-7 and quality tests will be needed to ensure it is up to standard for irrigation use.

Crop Characteristics

Plums

The rootstock I chose was Mariana (*P. cerasifera x P. munsoniana*) and the scions chosen were Methley, Santa Rosa, and Shiro. These will be grown in silt loam. Plum trees are propagated through budding onto seedlings or rootstock cuttings and take three to six years to begin fruiting. Chip budding, with the addition of auxin, is the propagation technique that would be used since it typically forms buds faster/stronger than t-budding and does not require the bark to be slipping. Plum trees should attain at least 6-8 hours of sunlight and would be kept in a greenhouse until they have successfully established new buds. Plums need to be watered at a higher frequency

when the growing season begins before beginning a regular water irrigation schedule. The rootstock causes semi dwarf trees so, in the orchard, the trees will be kept 10-20 ft apart. Since these are semi-dwarf trees they will have to be pruned down about 2 ft in height to keep them at about 8 ft, a reachable height from the ground. Plums grow in slightly acidic soil, a pH of 5-7, with good aeration and water drainage. These trees will be pruned during their dormant season, in spring before bloom. Plums are susceptible to black knot so most of the scions chosen are resistant. If infection occurs, fungicide can be applied during dormancy and the infected areas will need to be removed.

Mulberry

Mulberry is a perennial plant part of the genus Morus in the Moraceae family. It comes in three main species: white mulberry (Morus alba), red mulberry (Morus rubra), and black mulberry (Morus nigra). The tree itself is deciduous and can be either monoecious or dioecious. They are fast growing and can be propagated either by seed, grafting, air layering or cutting. If grown from seed it takes about 10 years before it begins to bear fruit. Morus alba hardwood cuttings root readily without need for auxin and can be propagated by sticking a 6" to 8" dormant cutting in perlite or sphagnum peat moss. Morus nigra is a bit harder to propagate from hardwood cutting and responds well to a treatment of 4000 ppm IBA. All three varieties root readily from softwood cuttings. A 6" to 10" softwood cutting with most of the leaves removed and dipped in auxin is one of the easier ways to root mulberry. Softwood cutting should be kept in a relatively humid environment, or on a mist bench until it roots. If grown from seed, mulberry has a high chance of coming out dioecious and is not true to seed. Growing from seed should mainly be reserved for rootstock cultivation. Mulberries prefer well-drained soils between pH 5.5 and 7.0. While not preferred, Morus rubra and Morus nigra can grow in soils up to pH 8.5. Most mulberries have very low chill hour requirements 200-400, they are usually self-pollinating.

Scion & Rootstocks

Mulberry

Scion	Black Beauty Mulberry (Morus nigra)	Beautiful Day (Morus alba x rubra)	Illinois Everbearing (Morus rubra)
Adaptation	<200 chilling needed	Cold hardy	Cold hardy

Phenology	Blooms early spring June-July (ripening)	Blooms in Spring July to September (ripening)	Blooms in Spring Late June to early fall (ripening)
Pollination	Self-fertile Wind Pollinated	Self-fertile Wind Pollinated	Self-Fertile Wind Pollinated
Fruit yield	15-25 lbs yield	15-20 lbs yield	15-25 lbs yield
Fruit Quality	Large black fruit Firm flesh	Small white fruits sweet	Firm texture and juicy flesh. Sweet
Pests/Disease	Bacterial and Fungal Leaf Spot Whitefly	Popcorn disease Whitefly	Whitefly

Table 2 *Mulberry Scion Information*

Rootstock	**Soil/preference/tolerance**	**Tolerance/resistance**	**Climatic adaptation**	**Unique traits**
Jan's Best Dwarf Everbearing	Soil pH of 6.5 USDA zones 5/6-9	Generally resistant to rots however, it is susceptible to root knot nematodes.	Cold hardy to zone 5.	dwarfing

Table 3*: Mulberry Rootstock Information*

Plum

The Rootstock I chose is the Mariana (*P. cerasifera x P. munsoniana*). This rootstock likes the pH around 5-7. It is resistant to oak wood fungus, crown rot, crown gall, and root knot nematodes. It will adapt to multiple different climates and soil conditions, it is tolerant to wet and heavy soils. This rootstock is semi dwarfing. A disadvantage is that Mariana is liable to produce suckers.

Name	Methley	Santa Rosa	Shiro
Adaptation	Cold hardy	Not cold hardy, is heat tolerant	Heat Tolerant
Phenology	Has a low chill requirement of 250 hours Blooms February to March Harvest in late May to early June Has heavy crop each season	300-500 hours Blossoms in Spring, around the end of March Harvest in late July	400-500 hours Blooms in March Harvest in late July to early August
Pollination	It is self-compatible. Methley pollinates through insect pollination. Additional pollinators will increase the yield. Is compatible with Santa Rose for pollination.	Santa Rosa is used as a pollinator and is self-compatible, however it sets better with cross pollination.	Shiro is compatible with Methley for pollination. Mainly it is pollinated through insect pollination.

Fruit Quality	Methley's fruit is a large purple–red clingstone that is sweet, round and firm.	The fruit is dark red skinned clingstone and the inside is yellow. Fruits are medium sized.	The fruit is large, round, yellow clingstone with a sweet flavor.
Pests and Diseases	Is susceptible to bacterial brown spot, black knot, scale, brown rot, scab, plum curculio, plum pox virus, aphids, and canker.	Is resistant to black knot. Is susceptible to bacterial brown spot, scale, brown rot, scab, plum curculio, plum pox virus, aphids, and canker.	Is resistant to black knot. Is susceptible to brown spot, bacterial brown rot, scab, plum curculio, plum pox virus, scale, aphids, and canker.

Table 3: *Plum Scions Information*

Site Preparation

The total area of the orchard is 42.54 acres, it will be split vertically down the center. The right side will contain mulberry trees while the left will contain plums trees. First, the orchard floor will be sprayed with a broadleaf weed killer and a broad spectrum grass herbicide to kill any weeds/grass present. The soil will then be ripped to break up any hardpan areas and roots deep in the soil. Lime will be added to the soil to bring it into a neutral range above a pH of 5.5. Over Soil will be pretreated with Paladin(Dimethyl Disulfide) or Telone II to suppress nematodes and soil borne pathogens. The areas to the far west of the orchard floor(marked Bbd) has a slope of 15%-30%. This area will be terraced. Organic matter depletion of this site is rated as moderately high so an organic mulch will be used in combination with compost to add OM. Phosphorus and potassium amendments will be added as needed.

Planting

Plum: The rootstocks would be bare-root if possible and planted 16 ft apart in rows that are planted 16 ft apart (16ft x 16 ft). The rootstocks would have to be planted by hand. The pre-grafted rootstocks would have to be checked for circling roots, cleaned and then planted into a hole that is a bit bigger than the roots. The rootstocks would have to be left sticking up some as they will sink. Approximately 170 plum trees per acre will be planted for a total of 3570 trees over 21 acres.

Mulberry: The rootstock for the mulberries is dwarfing however the scion isn't, so the trees will be spaced apart using recommendations for semi-dwarfing trees. They will be spaced 12 feet apart within rows and each row will be spaced 16 feet from each other. Pre-grafted mulberry trees will be container planted in holes dug 12 feet apart. They will then be pruned back to ensure the rootstock has enough time to strongly develop.Approximately 226 mulberry trees per acre will be planted per acre for a total of 4746 trees over 21 acres. A total of 8136 trees will be planted overall.

Frost Protection

Plums and mulberries are generally cold hardy and dormant during the winter so frost protection will be needed mainly during the spring as our chosen location is prone to late freezes. We will be using wind machines to invert the air and keep the temperatures above freezing.

Pollination

Plum: Methley is self-compatible, but additional pollinators will increase the yield. Methley is mainly pollinated by insects and is compatible with Santa Rose for pollination. Santa Rosa is used as a pollinator and is self-compatible. Shiro is compatible with Methley for pollination and is pollinated through insect pollination. I would use honey bees for pollination to promote cross pollination throughout the orchard.

Mulberry: Mulberries are self-compatible and pollinate themselves by wind, therefore they will not need any pollinator insects.

Orchard Floor Management

In between the rows will be grass strips to manage the weeds, the strips will be wide enough to get machinery through the orchard. The grass will need to be regularly mowed. The type of grass that would be used is a mixture of the ground cover grasses that survive in Tennessee, wheat and cereal rye. These could also be mixed with Hairy Vetch or Crimson Clove. Composted bark mulch will be added to the bases of the trees to reduce weed growth, add nutrients to the soil and help prevent erosion of the soil covering the roots. The herbicides used would be contact herbicides. They would be used to eliminate weeds and unwanted suckers. The herbicide to be potentially used is Gramoxone. Fungicides for Black Knot will also be applied if needed.

Fertility Management

General needs: No nitrogen will be applied the first year to avoid burning roots. A soil test will need to be performed to determine exact rates of fertilizer application. Until then all fertilizer rates are based on plant recommendations as opposed to soil NPK levels. Current plan is for fertilizer to be applied via drip irrigation(fertigation).

Second year forward:

Plums:

i. Granular fertilizer applied at bud break. 30lbs potash per acre.

ii. triple super phosphate 15 lbs per acre and worked into the top part of soil.

iii. Foliar application of zinc chelate every spring.

iv. Foliar application of a single spray of 1.0 lb B per acre, postharvest, prebloom, or if B deficiency symptoms appear during the growing season.

Mulberries and plums:

i. A total application of 14.238 lbs 10-10-10 fertilizer across 24 acres.

ii. Fertigation of micronutrients.

Pests/Disease Management

American Plum Borer and aphids are the main pests of concern. The American Plum Borer causes damage to the trunk and scaffolds leaving red lesions. Aphids would be dealt with herbicide if the potential or occurring economic damage would be severe. Black knot is a major disease that will be monitored. Is susceptible to brown spot, brown rot, scab, scale, plum curculio, plum pox virus, bacterial spot, canker, black knot and aphids. The solutions/preventative measures for these pests/diseases:

- American Plum Borer: Daizinon 50W, 1lb/100 gal water or Sevin 4F, 2-3 qt/acre, spray the trunks/scaffolds with pesticides two or three times in a growing season
- Bacterial Brown Spot: clean debris trees
- Brown Rot: Propiconazole, 4 fl oz./acre
- Scab: Fluopyram/Trifloxystrobin, 5.0-7.0 fl oz./acre
- Scale: Managed with beneficial predators, Narrow Range Oil, 4 gal/acre
- Plum Curculio: Imidan 70W, 2.125 lbs, contact herbicide, apply at petal fall
- Plum pox virus: PPV control/eradication is very difficult, if plants are infected with PPV they will be quarantined and destroyed to prevent the spread of the disease. Other measures to control pests in the area that may be vectors will also be put into place.
- Canker: Cut out infected areas, prune back into healthy wood, and apply a copper fungicide
- Black Knot: Removed parts of the trees infected with knots below the knot into the healthy wood. Pruning for black knot needs to be done during the regular pruning time.
- Mealy Plum Aphids: Natural predators to the mealy plum aphids are used to manage aphids or apply Zinc sulfate, 10-20 lb/acre, pheromone traps placed out when temperatures start to rise
- Suckers: prune off the suckers while they are young and then apply Paraquat on contact

Common pests of mulberry include whitefly, Glassy-Winged Sharpshooter, and scales. Common diseases are Armillaria root rot and bacteria blight. Treatment of insect pests will include: releasing helpful predators(ladybugs & praying mantis).

- Flupyradifurone will be sprayed at a rate of 12 oz/acre for soft scale/sharpshooter infestation.
- Buprofezin will be applied at emergence of whiteflies and scales at a rate of 13oz/acre once every harvest cycle.
- Armillaria will be prevented by monitoring tree health, killing infected trees and burning the wood.

- Bacteria blight will be managed by application of spray bactericides containing copper.
- Canker: Cut out infected areas, prune back into healthy wood, and apply a copper fungicide.

Training/Pruning

Plum Training/Pruning: Plums fruits on wood up to 2 years old. Suckers, vertical shoots, damaged and diseased parts are removed and cut back to the buds to keep fruit growth towards the bottom of the tree. The trees would be pruned by hand to carefully and sterilely prune the trees. This will be done during spring before bud break. When the rootstocks are initially planted, the trees will be pruned to initiate scion growth. After the trees are fully established, they will be pruned to stay around 8 ft tall for accessibility. The branches will be pruned to have an open center, with adequate space between for sunlight penetration and no growth interference between branches.

Mulberry Training/Pruning: Note- mulberries are usually pruned in the winter to avoid sap leakage.

a. Year one: Plant grafted trees and heavily prune to ensure rootstock is well established.

b. Year two: Allow vegetative growth while thinning branches to form a bowl shape

c. Year three: Mulberries fruit on current season's new growth, so they will be heavily pruned in the winter.

Irrigation

A shallow commercial well would be more feasible than getting right away through other properties to access the closest river(Duck River) and getting federal and state permission to be able to draw water out of it. The well would also be a more stable and reliable source of water for irrigation. The well would be used to supply a ¾” tubing drip irrigation system. The water will be applied at least a depth of 2 ft. When the trees are young, a recommended rate of 2-3 gallons of water per tree will be supplied weekly and as they grow and increase in size a total of

40,752 gallons of water will be supplied weekly. 130 gallons will be emitted per acre. 1.3 gph of water will be emitted for one hour daily for plums, and 1.7 gph daily for an hour for mulberries will be supplied during peak demand. This totals to 8,288.04 gph for mulberries and 4,641 gph for plums. The well faucets will be split into two different sections, one to supply water for the plums and one to supply water for the mulberries. These separated drip irrigation systems will be from the same water well just separated so the fertilizers can be supplied to their respective crop.

Special Provisions

Plum:

a. Year one

i. January-spraying soil with broad spectrum herbicide to kill weeds

ii. February- ripping soil and applying nematicide

iii. March-Installation of irrigation system and applying lime to soil

iv. April -Planting pre-grafted plum rootstocks and cultivating grass strips.

v. May-Additional of all fertilizer except zinc and nitrogen

vi. June-July Monitoring tree health, checking for pests

vii. August- Spraying (if needed) for pests

viii. September-November- Monitoring trees and spraying contact herbicide upon emergence of weeds. Cultivating grass strips.

ix. December - dormancy, check for chill injury

b. Year two

i. January-spraying soil with broad spectrum herbicide to kill weeds if needed

ii. February- applying nematicide if needed, pruning

iii. March- quality check of soil and irrigation system

iv. April – quality check of grass strip, place aphid pheromone traps if needed

v. May-Additional of all fertilizer except zinc and nitrogen

vi. June- Monitoring tree health, checking for pests, potentially begin harvest

vii. July- harvest

vii. August- Spraying (if needed) for pests, potential harvest

viii. September-November- Monitoring trees and spraying contact herbicide/pesticide upon emergence of weeds/pests. Cultivating grass strips.

ix. December - dormancy, check for chill injury

c. Year three

i. January-spraying soil with broad spectrum herbicide to kill weeds if needed

ii. February- applying nematicide if needed, pruning

iii. March- quality check of soil and irrigation system

iv. April – quality check of grass strip, place aphid pheromone traps if needed

v. May-Additional of all fertilizer except zinc and nitrogen

vi. June- Monitoring tree health, checking for pests, potentially begin harvest

vii. July- harvest

vii. August- Spraying (if needed) for pests, potential harvest

viii. September-November- Monitoring trees and spraying contact herbicide/pesticide upon emergence of weeds/pests. Cultivating grass strips.

ix. December - dormancy, check for chill injury

d. Year four

i. January-spraying soil with broad spectrum herbicide to kill weeds if needed

ii. February- applying nematicide if needed, pruning

iii. March- quality check of soil and irrigation system

iv. April – quality check of grass strip, place aphid pheromone traps if needed

v. May-Additional of all fertilizer except zinc and nitrogen

vi. June- Monitoring tree health, checking for pests, potentially begin harvest

vii. July- harvest

vii. August- Spraying (if needed) for pests, potential harvest

viii. September-November- Monitoring trees and spraying contact herbicide/pesticide upon emergence of weeds/pests. Cultivating grass strips.

ix. December - dormancy, check for chill injury

e. Year five

i. January-spraying soil with broad spectrum herbicide to kill weeds if needed

ii. February- applying nematicide if needed, pruning

iii. March- quality check of soil and irrigation system

iv. April – quality check of grass strip, place aphid pheromone traps if needed

v. May-Additional of all fertilizer except zinc and nitrogen

vi. June- Monitoring tree health, checking for pests, potentially begin harvest

vii. July- harvest

vii. August- Spraying (if needed) for pests, potential harvest

viii. September-November- Monitoring trees and spraying contact herbicide/pesticide upon emergence of weeds/pests. Cultivating grass strips.

ix. December - dormancy, check for chill injury

f. Year six

i. January-spraying soil with broad spectrum herbicide to kill weeds if needed

ii. February- applying nematicide if needed, pruning

iii. March- quality check of soil and irrigation system

iv. April – quality check of grass strip, place aphid pheromone traps if needed

v. May-Additional of all fertilizer except zinc and nitrogen

vi. June- Monitoring tree health, checking for pests, potentially begin harvest

vii. July- harvest

vii. August- Spraying (if needed) for pests, potential harvest

viii. September-November- Monitoring trees and spraying contact herbicide/pesticide upon emergence of weeds/pests. Cultivating grass strips.

ix. December - dormancy, check for chill injury

g. Year seven

i. January-spraying soil with broad spectrum herbicide to kill weeds if needed

ii. February- applying nematicide if needed, pruning

iii. March- quality check of soil and irrigation system

iv. April – quality check of grass strip, place aphid pheromone traps if needed

v. May-Additional of all fertilizer except zinc and nitrogen

vi. June- Monitoring tree health, checking for pests, potentially begin harvest

vii. July- harvest

vii. August- Spraying (if needed) for pests, potential harvest

viii. September-November- Monitoring trees and spraying contact herbicide/pesticide upon emergence of weeds/pests. Cultivating grass strips.

ix. December - dormancy, check for chill injury

h. Year eight

i. January-spraying soil with broad spectrum herbicide to kill weeds if needed

ii. February- applying nematicide if needed, pruning

iii. March- quality check of soil and irrigation system

iv. April – quality check of grass strip, place aphid pheromone traps if needed

v. May-Additional of all fertilizer except zinc and nitrogen

vi. June- Monitoring tree health, checking for pests, potentially begin harvest

vii. July- harvest

vii. August- Spraying (if needed) for pests, potential harvest

viii. September-November- Monitoring trees and spraying contact herbicide/pesticide upon emergence of weeds/pests. Cultivating grass strips.

ix. December - dormancy, check for chill injury

i. Year nine

i. January-spraying soil with broad spectrum herbicide to kill weeds if needed

ii. February- applying nematicide if needed, pruning

iii. March- quality check of soil and irrigation system

iv. April – quality check of grass strip, place aphid pheromone traps if needed

v. May-Additional of all fertilizer except zinc and nitrogen

vi. June- Monitoring tree health, checking for pests, potentially begin harvest

vii. July- harvest

vii. August- Spraying (if needed) for pests, potential harvest

viii. September-November- Monitoring trees and spraying contact herbicide/pesticide upon emergence of weeds/pests. Cultivating grass strips.

ix. December - dormancy, check for chill injury

j. Year ten

i. January-spraying soil with broad spectrum herbicide to kill weeds if needed

ii. February- applying nematicide if needed, pruning

iii. March- quality check of soil and irrigation system

iv. April – quality check of grass strip, place aphid pheromone traps if needed

v. May-Additional of all fertilizer except zinc and nitrogen

vi. June- Monitoring tree health, checking for pests, potentially begin harvest

vii. July- harvest

vii. August- Spraying (if needed) for pests, potential harvest

viii. September-November- Monitoring trees and spraying contact herbicide/pesticide upon emergence of weeds/pests. Cultivating grass strips.

ix. December - dormancy, check for chill injury

Mulberries:

a. **Year one**

i. January-spraying soil with broad spectrum herbicide to kill weeds, performing soil test to determine fertilizer needs.

ii. February-ripping soil and applying nematicide

iii. March-Installation of irrigation system and applying lime to soil

iv. April -Planting mulberry trees and cultivating grass strip.

v. May-Additional of all fertilizer except zinc and nitrogen

vi. June-July Monitoring tree health, checking for pests

vii. August- Spraying (if needed) for pests

viii. September-November- Monitoring trees and spraying contact herbicide upon emergence of weeds. Cultivating grass strip.

ix. December -Pruning mulberry trees.

b. **Year two**

i. January- February- Mulberries are dormant, checking for pests and chill injury. Weeding.

ii. March- Application of all fertilizers. Setting out insect pheromone and sticky traps.

iii. April- Spraying for glassy wing sharpshooters and bacterial blight, weeding.

iv. May- Monitoring tree health and checking insect traps

v. June- Spraying for glassy wing sharpshoots.

vi. July- Checking for signs of heat stress.

vii. August- spraying for whiteflies.

viii. September- November- Monitoring plant health.

ix. December- Plants go into dormancy, pruning

c. Y**ear Three**

i. January- February- Mulberries are dormant, checking for pests and chill injury. Weeding.

ii. March- Application of all fertilizers. Setting out insect pheromone and sticky traps. Adding lime to soil.

iii. April- Spraying for glassy wing sharpshooters and bacterial blight, weeding.

iv. May- Monitoring tree health and checking insect traps

v. June- Spraying for glassy wing sharpshoots. Harvesting mulberries

vi. July- Checking for signs of heat stress. Harvesting mulberries

vii. August- spraying for whiteflies. Harvesting mulberries

viii. September- November- Monitoring plant health.

ix. December- Plants go into dormancy, pruning.

d. **Year four-Ten**

i. January- February- Mulberries are dormant, checking for pests and chill injury. Weeding. Testing soil for nutrient content and presence of nematodes.

ii. March- Application of all fertilizers, as well as addition of molybdenum. Setting out insect pheromone and sticky traps. Adding lime to soil.

iii. April- Spraying for glassy wing sharpshooters and bacterial blight, weeding.

iv. May- Monitoring tree health and checking insect traps

v. June- Spraying for glassy wing sharpshoots. Harvesting mulberries

vi. July- Checking for signs of heat stress. Harvesting mulberries

vii. August- spraying for whiteflies. Harvesting mulberries

viii. September- November- Monitoring plant health.

ix. December- Plants go into dormancy, pruning.

Expected Yields

The total expected yield for mulberries is 71,190lbs-118,650 lbs.
The total expected yield for plums is 214,200lbs to 428,400 lbs.

Yield Fluctuations

Mulberries are not alternate bearing, so there are no expectations of a smaller crop one year than the next. It is a very stable tree and outside of climatic conditions such as extreme drought or frost and high pest populations, no yield fluctuations are expected.

Plums in our location are prone to late freeze damage which can affect the amount of buds that produce a crop for that season. Plums are also alternate bearing and may produce varying amounts of crops from one year to the next.

Harvest

Plums and Mulberries will be harvested partially through pick your own sales. Plums start ripening in early May so a team of employees will have to be hired to hand pick the fruit from the trees. Mulberries ripen over the course of about a month to two months(june-september) and they are non-climacteric so trees that appear ripe with mulberries that have not been harvested by customers will be harvested using shake and catch.

Marketing Plan

We plan to sell both plums and mulberries in a “pick your own” type fashion. The orchard will be open for people to pick their own produce starting Early May to late August. In late winter through Spring parts of the orchard will be open for photo shoots, wedding reservations, and picnics, prices may vary. Mulberries will be sold at a price of 17.99$ per lb for fresh mulberries and 13.99$ lb for dried mulberries. 10% of total yield will be harvested for express purpose of producing purple preserves and purple jelly. Plums will be sold for 4.99$ per lb and prunes for 6.99$ per lb. Dried fruit and preserves will be sold at the gift shop located at the edge of the orchard. Dried fruit will be offered both online and in local stores. Fresh plums and mulberries will be sold in the gift shop, however only plums will be marketed to local markets because mulberries have a shelf life of 2-3 days. Another 10% of total yield will be set aside for producing specialty drinks(wine) and artisan vinegar.

Summary

Purple Orchard will be a specialty orchard focused on producing plums and mulberries. Part of the appeal of our orchard is that it will be focused on a central color(purple) and all products of the orchard will be varying shades of it. Part of our expected income will come from byproducts of plums and mulberries, such as wine, vinegar, preserves, jelly and dried fruit. The other part of our yield will be from marketing as pick your own produce or sales from in-store purchases. We plan to plant mulberries and plums on 21 acres each for a total of 42 acres and use drip irrigation to keep them watered in dried seasons. Our orchard location will be in Hickman Tennessee and our soil is well drained with a slightly acidic PH.

Strengths:Mulberries are cold hardy and disease resistant, plums have moderate storage life 2-8 weeks and can be harvested before ripening. Our soil is slightly acidic so we won't have to worry about injuries due to alkalinity or inability to take up certain micronutrients(iron). The soil texture provides good drainage and mulberries don't need much fertilizer to grow well.

Challenges: Mulberries ripen over a long period of time and are non-climacteric so they have to be harvested once they ripen. Because the fruits do not all ripen at once they have to be harvested several times. Plums are susceptible to a wide variety of diseases and this may cause our overall costs to increase. Mulching costs more money than bare soil and we will have to factor this into our orchard costs.

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