
TREE PLANTING & MAINTENANCE

WILLIAMS COUNTY OHIO



WILLIAMS SOIL AND WATER CONSERVATION DISTRICT



Williams Soil & Water Conservation District is guided by a dedicated Board of Supervisors and supported by skilled staff committed to preserving and improving our natural resources. Together with our NRCS partners, we work to promote responsible land use, provide technical assistance, and deliver educational programs that strengthen conservation efforts across our community.

BACKGROUND / OVERVIEW

Who is Ed Nickolite?

Local landowner. Navy Veteran. 40 Years Utility Business.

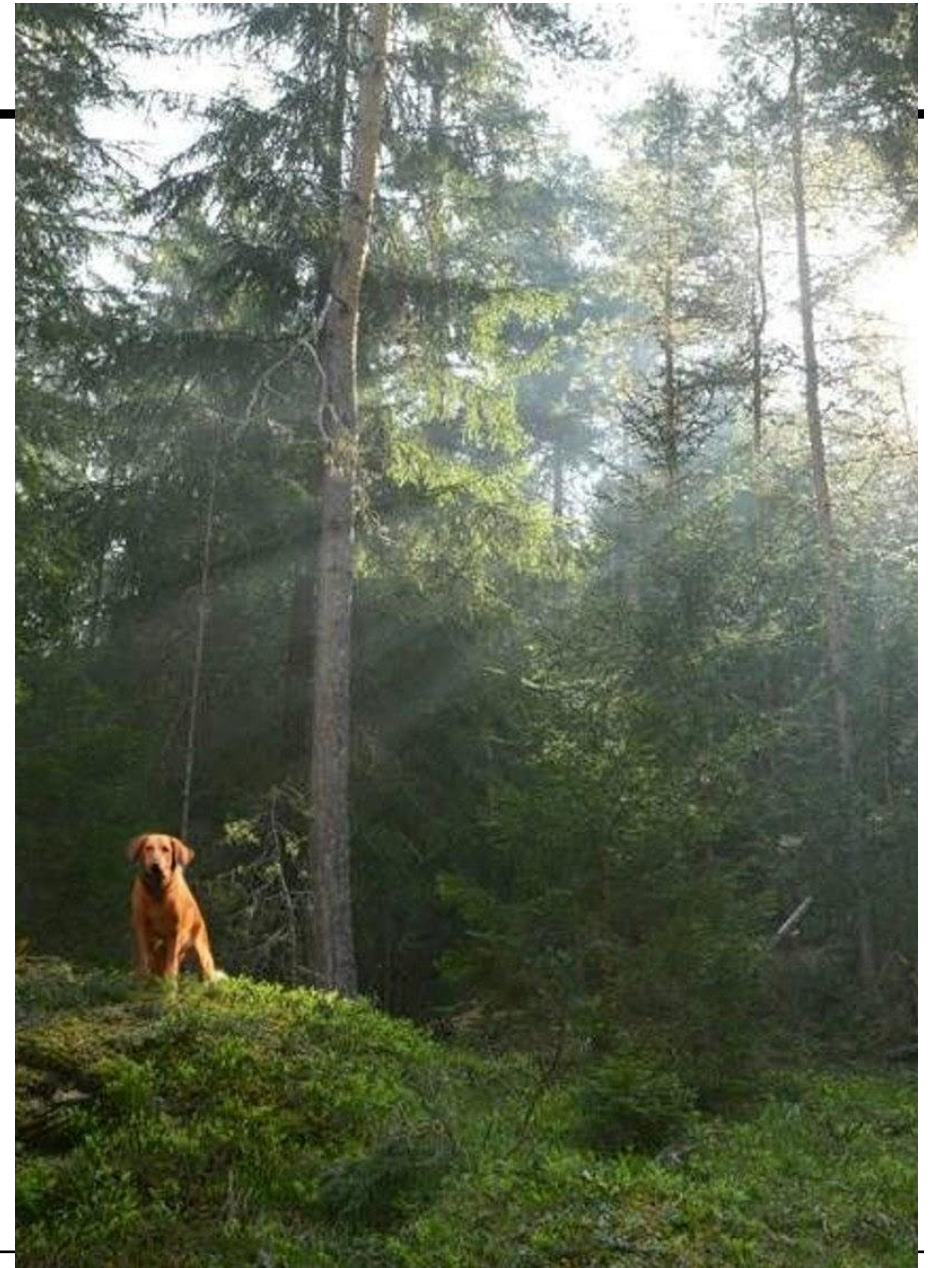
95 acres. 2 Parcels, 40 acre and 55 acre.

Currently 2 Forest Stewardship Plans on 79 acres.

Planted 4,500 Trees and Shrubs to date. 500 planned for 2026. Direct Seeded 8500 acorns.

47 varieties of trees and shrubs.

- 29 Native, 18 Non-native Varieties
- 75% Native, 25% Non-Native by count
- 85% Survival rate Native, 62% Non-Native



THE “BEST WAY” TO PLANT AND MAINTAIN TREES

- **Determine your outcome:** Backyard Specimen to Reforestation
- **Plan your layout:** Just like building a house, a plan is a good idea
- **Determine your Species:** Native or Non-Native. Function or Beauty. Timber value, food value, habitat value.
- **Source your trees:** WSWCD, Tree Farms, Specialty Suppliers, Big Box Stores
- **Planting Method:** Shovel, Auger, Dibble bar, tow behind tree planter. Trim roots and tops?
- **Protection and 1st year care:** Tube, Cage, Stake, or let Mother Nature run its course. Mulch, water, feed.
- **Train and youth care:** Weeds, trim, water, feed
- **Threats:** Weather, Weeds, Animals, Bugs, Fungus, etc.

DETERMINE YOUR OUTCOME

Backyard Specimen to Reforestation

- A single tree in your backyard
- A small group of trees for fruit(plums, peaches, apples, pears, persimmons, pawpaws).
- Improve the aesthetics of your property.
- Improve habitat for native species. Pollinators, Birds, Wildlife.
- Native Landscaping in front of your new barn.
- Improve your existing woodlot for habitat
- Supplement natural regeneration of a fallow farm plot
- Create or convert expired CRP to an Oak Savana
- Creating a Shelter Belt
- Beginning a Silvopasture or Agroforestry Practice
- Replanting a woodlot after a timber harvest
- Reforestation of a parcel for timber or habitat

PLAN YOUR LAYOUT

Just like building a house, a plan is a good idea

- No matter your vision, a plan is a good idea. It helps you know when your there, and course correct along the way. Plans can change and evolve or time.
- Soil type matters. Heavy clay or Sandy loam.
- Topography. Hills, slopes, streams, wet spots, dry spots. Seasonal flooding, standing water.
- Location, along road, street, woods, neighbors house
- Tree variety
- Tolerances to heat, drought, water, flooding, salt
- Tree Spacing/Density
- Future property access
- Tree Maintenance

DETERMINE YOUR SPECIES

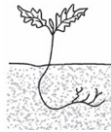
- Native or Non-Native. Local native species provide the most value to local ecosystem. Native species generally perform better in our area. Non-Native can become invasive and displace Native species.
- Function or Beauty.
- Timber value. Black Walnut is the most valuable, Followed by White Oak, Red Oak, and so on.
- Food value. Human vs. Wildlife. Native and Non-Native.
- Habitat value. Food, Shelter, Cover, Nesting.
- Availability.
- Interspecies Compatibility. Black Walnut produces Juglone, allelopathic to some trees/shrubs.

SOURCE YOUR TREES

- WSWCD, yearly tree sale. Offer a nice variety, differing every year, hardwoods, conifers, and shrubs. Neighboring SWCDs.
- Tree Farms, offer bulk sales, with a large variety.
- Specialty Suppliers, offer special habitat trees, hybrids, smaller quantities, usually more expensive. Some not supported in our ecoregion.
- Big Box Stores. Limited variety, but larger potted trees. Can find some pretty good deals at end of season, but be careful as these specials can be stressed.
- Local nurseries. Normally most expensive. Larger potted trees. Usually well cared for.

PLANTING METHOD

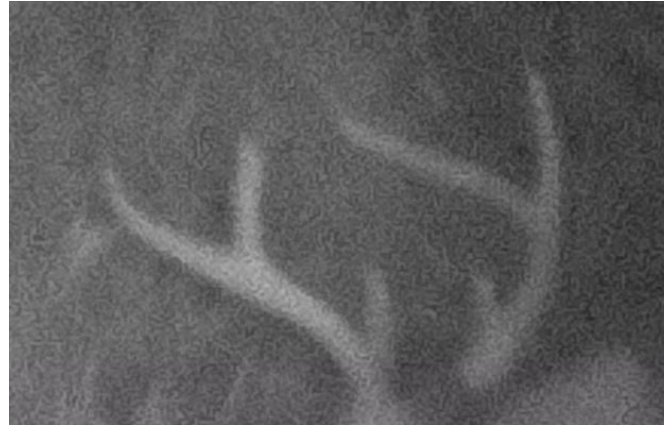
- Shovel
- Auger
- Dibble bar
- Tow behind tree planter.
- Trim roots and tops?
 - Roots should be trimmed to fit hole.
 - No J-roots.
 - Tops trimmed to fit tube or cage.
- Inoculate with mycorrhizal fungi can help root health, water and nutrient absorption



ED's GUIDELINES FOR TREE TUBES AND CAGES



- Choose wisely
 - Most Conifers – Cage
 - Most Fruit Trees – Cage
 - Most Hardwoods - Tube
- Tube Height
 - Most Cases – 5 foot
 - Starter Shrubs 1-2 feet
- Leave tree tubes on until they split and fall off
- Stake with like height ½” Schedule 40 PVC(my preferred)
- Trim to 1 stem inside tube when dormant.
 - “There can be only One” -- Highlander
 - Make it look like asparagus
- Cages-6 ft. T-Post, 4 ft. section of 3”x4” 5 ft. Fencing
- Bird nets for tubes



PROTECTION AND 1ST YEAR CARE

- Protection is Critical for young trees, especially in rural areas.
- Tube, Most hardwoods. Mixed success with Bald Cypress
 - Cost is \$5 per tube, \$2 per stake
- Cage, Fruit trees, Conifers
 - Cost is \$5 per T-Post, \$5.50 per 4 foot Piece of Welded Wire Fencing
- Stake, Works with no deer pressure.
- Mother Nature take care. Plant in bulk and hope for the best.
- Mulch, around trees for weed prevention and water retention.
- Water if needed. Be careful not to over water.
- Feed. Primarily fruit trees or conifers. Oaks don't need it.
- Mark your trees by year. I use different color Duct Tape.



TRAINING AND YOUTH CARE

- Weeds suck up nutrients and water. Mulching helps. Trees and grass do not get along. Yard grass is allelopathic.
- Trim, one stem while in the tube. Shape as desired after that. Trees should grow past top of tube in 2-3 years.
- Tubes promote vertical growth, so stems will be weak. Leave them in the tube until they split the tube. Tubes are designed to split as the tree ages.
- Tubes offer protection from deer browse and rubs. Leave the tubes on. You can remove the stake when the trees can stand on their own. Leave the tubes on.
- Water, but don't overwater your trees. Trees should be able to survive on their own without supplemental watering after year 3.
- Oaks do not normally need supplemental feeding. Conifers and Fruit trees will benefit.
- Soil ph can be a factor. Williams County tends to be somewhat on the acidic side. Lime can help. Test first.
- Trim Trees when dormant.

THANK YOU

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Sources for Trees and Shrubs

- [Arbor Day](#)
- [Alpha Nurseries](#)
- [Porcupine Hollow Farms](#)
- [Morse Nursery](#)
- [Mossy Oak Nativ Nurseries](#)
- [Cold Stream Farms](#)
- [Kelly Tree Farms](#)
- [Chief River Nursery](#)
- [Williams County Soil and Water Conservation District](#)
- [Fulton County Soil and Water Conservation District](#)
- [Willis Orchards](#)
- [American Meadows](#)
- [High Country Gardens](#)

Information for Trees and Shrubs

- [ODNR Division of Forestry](#)
- [ODNR Tree Planting Guide](#)
- [USDA Natural Resources Conservation Service, Plants Database](#)
- [Morton Arboretum—Plant and Tree Care](#)
- [OSU-Ohio Woodland Stewards Program](#)
- [Dr. Craig Harper-Professor and Extension Wildlife Specialist](#)
- [Ohio Timber Price Report](#)
- [Juglone\(Black Walnut\) Tolerance—Penn State](#)

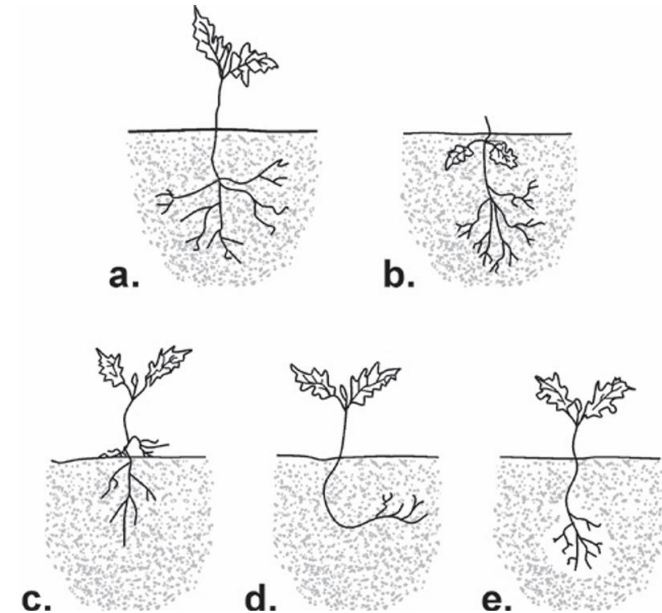


Figure 8.10. It is critical that tree seedlings be (a) planted properly; they should not be planted (b) too deep, (c) too shallow, (d) with roots bent upwards, or (e) with air pockets.

- How Many Trees are Needed?

Tree Density Calculation							
Square ft per Acre	43650	43650	43650	43650	43650	43650	43650
Row Spacing	15	20	30	30	40	40	40
Tree Spacing	15	20	20	30	20	30	40
Square ft per tree	225	400	600	900	800	1200	1600
Trees per acre	194	109.125	72.75	48.5	54.5625	36.375	27.28125
	Timber / Reforestaion			Wildlife Habitat	Silvopasture / Agroforestry		

Note: This spacing chart assumes tree protection is used for survivability.

Flood Tolerant Trees	Ohio Native	Intermediate Flood Tolerant Trees	Ohio Native	Flood Intolerant Trees	Ohio Native
Alders (<i>Alnus</i> spp.)—most species		American elm (<i>Ulmus americanus</i>)	Y	American basswood (<i>Tilia americana</i>)	Y
American larch (<i>Larix laricina</i>)		American holly (<i>Ilex opaca</i>)	Y	Amur maple (<i>Acer ginnala</i>)	
Baldcypress or swamp cypress (<i>Taxodium distichum</i>)	Y	American Mountain Ash (<i>Sorbus americana</i>)		Apple (<i>Malus</i> spp.)	
Balsam poplar (<i>Populus balsamifera</i>)		Arborvitae (<i>Thuja</i> spp.)	Y	Beeches (<i>Fagus</i> spp.)	Y
Bird cherry (<i>Prunus padus</i>)		Balsam fir (<i>Abies balsamea</i>)	Y	Bigtooth aspen (<i>Populus grandidentata</i>)	
Black poplar (<i>Populus nigra</i>)		Bitternut Hickory (<i>Carya cordiformis</i>)	Y	Black locust (<i>Robinia pseudacacia</i>)	
Black spruce (<i>Picea mariana</i>)		Black walnut (<i>Juglans nigra</i>)	Y	Black oak (<i>Quercus velutina</i>)	Y
Catalpa (<i>Catalpa</i> spp.)	Y	Buckeyes (<i>Aesculus</i> spp.)	Y	Butternut (<i>Juglans cinerea</i>)	Y
Cottonwoods (<i>Populus deltoides</i> and others)	Y	Buckthorn (<i>Rhamnus cathartica</i>)		Charms (<i>Carpinus</i> spp.)	
Dawn redwood (<i>Metasequoia glyptostroboides</i>)		Bur oak (<i>Quercus macrocarpa</i>)	Y	Cherries (<i>Prunus</i> spp., except <i>P. padus</i>)	
Green ash (<i>Fraxinus pennsylvanica</i>)	Y	Chestnuts (<i>Castanea sativa</i> and others)	Y	Chestnut Oak (<i>Quercus montana</i>)	Y
Hackberries (<i>Celtis</i> spp.)	Y	Chinquapin Oak (<i>Quercus muehlenbergii</i>)	Y	English holly (<i>Ilex aquifolium</i>)	
Manitoba maple or boxelder (<i>Acer negundo</i>)	Y	Common aspen (<i>Populus tremula</i>)		Cork tree (<i>Phellodendron amurense</i>)	
Overcup oak (<i>Quercus lyrata</i>)		English oak (<i>Quercus robur</i>)		Crabapples (<i>Malus</i> spp.)	
Pecan (<i>Carya illinoensis</i>)	Y	European ash (<i>Fraxinus excelsior</i>)		Crape-myrtle (<i>Lagerstroemia indica</i>)	
Persimmon (<i>Diospyros virginiana</i>)	Y	Field elm (<i>Ulmus minor</i>)		Douglas fir (<i>Pseudotsuga menziesii</i>)	
Red maple (<i>Acer rubrum</i>)	Y	Field maple (<i>Acer campestre</i>)		Downy oak (<i>Quercus pubescens</i>)	
River birch (<i>Betula nigra</i>)	Y	Fringetree (<i>Chionanthus</i> spp.)		European larch (<i>Larix decidua</i>)	
Silver fir (<i>Abies alba</i>)		Honeylocust (<i>Gleditsia triacanthos</i>)	Y	Flowering dogwood (<i>Cornus florida</i>)	
Silver maple (<i>Acer saccharinum</i>)	Y	Hophornbeams (<i>Ostrya</i> spp.)		Ginkgo (<i>Ginkgo biloba</i>)	
Sweetgum (<i>Liquidambar styraciflua</i>)	Y	Horse chestnuts (<i>Aesculus</i> spp.)		Golden raintree (<i>Koelreuteria paniculata</i>)	
Sycamore (<i>Platanus</i> spp.)	Y	Lacebark elm (<i>Ulmus parvifolia</i>)		Hawthorn (<i>Crataegus</i> spp.)	Y
Water hickory (<i>Carya aquatica</i>)		Littleleaf linden (<i>Tilia cordata</i>)		Hemlock (<i>Tsuga</i> spp.)	Y
Water oak (<i>Quercus nigra</i>)		Loblolly pine (<i>Pinus taeda</i>)		Japanese lilac (<i>Syringa reticulata</i>)	
Water tupelo (<i>Nyssa aquatica</i>)		Paper birch (<i>Betula papyrifera</i>)		Japanese maple (<i>Acer palmatum</i>)	
Willows (<i>Salix</i> spp.)—most species		Pin oak (<i>Quercus palustris</i>)	Y	Junipers (<i>Juniperus</i> spp.)	Y
Winged elm (<i>Ulmus alata</i>)		Plums (<i>Prunus</i> spp.)	Y	Kentucky coffeetree (<i>Gymnocladus dioica</i>)	Y
		Quaking aspen (<i>Populus tremuloides</i>)		Kousa dogwood (<i>Cornus kousa</i>)	
		Serviceberry (<i>Amelanchier</i> spp.)		Large-leaved lime (<i>Tilia platyphyllos</i>)	
		Shellbark hickory (<i>Carya laciniosa</i>)	Y	Magnolias (<i>Magnolia</i> spp.)	
		Shagbark hickory (<i>Carya laciniosa</i>)	Y	Mountain ash or rowantree (<i>Sorbus</i> spp.)	
		Slippery elm (<i>Ulmus rubra</i>)		Northern Red Oak (<i>Quercus Rubra</i>)	Y
		Smoketree (<i>Cotinus</i> spp.)		Norway maple (<i>Acer platanoides</i>)	
		Sugar maple (<i>Acer saccharum</i>)	Y	Paperbark maple (<i>Acer griseum</i>)	
		Swamp chestnut oak (<i>Quercus michauxii</i>)	N	Pears (<i>Pyrus</i> spp.)	
		Swamp white oak (<i>Quercus bicolor</i>)	Y	Persian walnut (<i>Juglans regia</i>)	
		Tupelo or black gum (<i>Nyssa sylvatica</i>)		Pignut hickory (<i>Carya glabra</i>)	
Sourced from University of Tennessee		White ash (<i>Fraxinus americana</i>)	Y	Pines (<i>Pinus</i> spp., except <i>P. tieda</i>)	
		White poplar (<i>Populus alba</i>)		Redbuds (<i>Cercis</i> spp.)	Y

**ACTUAL AND POTENTIAL DIAMETER GROWTH OF SELECTED UPLAND
HARDWOOD SPECIES**

Species	Potential growth rate in managed stand	Age of 16" tree		Age of 22" tree	
		Unmanaged Stands	Managed Stands	Unmanaged Stands	Managed Stands
	(rings per inch)	years	years	years	years
Yellow-poplar	5	67	40	90	55
Black Walnut	5	76	40	104	55
Scarlet Oak	6	82	48	108	66
Red Oak	6	87	48	113	66
White Ash	7	90	56	119	77
Black Oak	7	90	56	121	77
Sugar Maple	8	104	64	137	88
White Oak	8	114	64	146	88
Beech	8	114	64	151	88
Hickory	10	126	80	168	110
Chestnut Oak	10	129	80	164	110