

Establishing and Maintaining Tree Plantations and Controlling Invasives

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Possible Opportunities

- Tree planting sites
 - Mowing, spraying, planting, mulching, deer repellents, fence or tree shelter installation, tending & removal
- Invasive plant control
 - Identification, planning, control of plants by various methods, monitoring

Understand Your Client

- Motivation for planting/management
- Knowledge
- Personal ability to do work
- Financial ability to complete and continue management

Financial Assistance

- Cost-Share & Incentive Programs
 - CREP, EQIP, State programs
- Mitigation or easement programs
 - Forest Conservation Act or Forest Retention Ordinance (MD)
- Property tax moderation
 - FCMA or Forest Stewardship Plan (MD)
- Talk to MD DNR or PA DCNR Foresters, USDA-FSA and SCD office, Chesapeake Bay Foundation (CBF)
- Planting & Management must meet standards – & abide by the limitations - of the “program”.

Establishment

- More than one way to skin a cat
 - Several approaches and techniques can work
 - Meet expectations and abilities of client and requirements of financial assistance source (i.e., government, non-profit, etc.)

Establishment - continued

- Best long-term goal – a forest not a park
 - Native Plants!
 - Mostly closed canopy, with some mid-story, understory, and groundcover vegetation, leaf litter and humus.
 - Not widely spaced trees being mowed underneath, or otherwise dominated by non-native grasses (as in turf).

Establishment – Natural vs. Artificial Regeneration

- Natural Regeneration
 - Let seedlings “volunteer” via seed carried in by wind, birds, squirrels
 - Often overlooked
 - Sometimes very successful
 - Almost always cheaper
 - Look for indications, conditions
 - Pre-existing seedlings, nearby seed trees, exposed soil or non-grassy

Natural Regeneration -Continued

- Site preparation to encourage N.R.
 - Eliminate problem weeds, especially vines and shrubs
 - Eliminate or reduce grass cover
 - Expose & loosen soil if needed
 - Disk, plow, till, etc.
- Continue to control problem weeds
- Can augment N.R. with Artificial Regeneration

Artificial Regeneration

- Planting “trees”, (*includes shrubs hereinafter*)
- Can be direct seeding, bare-root seedlings, container stock, B&B, etc.
- Appropriate planting tools and methods for each
- Today mostly talk about Artificial Regen, but much of this also relates to Nat Reg.

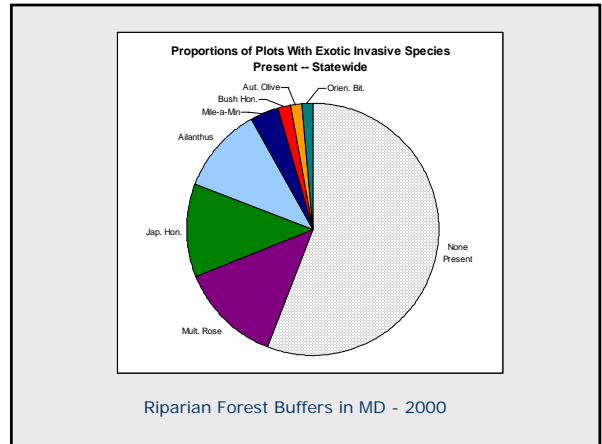
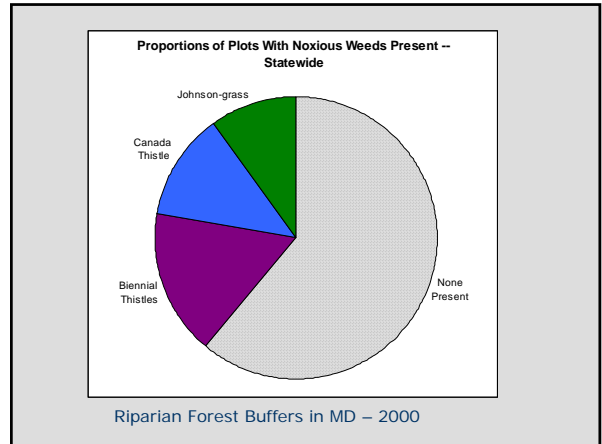
Establishment Process

- Site Evaluation
- Design
- Site Preparation
- Planting
- Protection
- Maintenance

Site Evaluation

- Field Visit
 - Soil and moisture conditions (sample soil via core sampler, auger or shovel), Soil Survey
 - Flood potential
 - Existing, or recent, vegetation
 - Potentially problem weeds
 - State-listed noxious weeds
 - MD - Johnson-grass, Canada thistle, biennial thistles (musk, plumeless, bull)
 - Invasive exotic weeds – see lists and websites
 - Grass cover
 - Perennial grasses are usually the worst weeds
 - Root competition and voles





Site Evaluation – continued

- Nearby seed sources for weeds and for natural regeneration of trees and shrubs (desirable or undesirable)
- Potential damage from deer, voles, mice, beaver
- Match the plan for site preparation, planting and maintenance to site conditions and potential problems

Site Preparation

- Site should usually be prepared in the year prior to spring planting
- Site physically ready to be planted and maintained in the prescribed manner
- All noxious and problem weeds controlled
- If not, wait a year (or 2) and work on it until it is ready



Vegetation Management

- For Site Preparation, Maintenance, & Other (non-planted) Areas.
- Why are weeds a problem?
 - Propagation of noxious weeds
 - Hide small trees, mowing mortality
 - Competition for tree seedlings
 - Sunlight, moisture, nutrients, space

Vegetation Mgmt - continued

- Allelopathy (chemical warfare)
 - Best-known example, Black Walnut can kill certain plants (Heath, Pine & Nightshade Families)
 - "Meadow" vegetation fights to keep out trees
 - Tall fescue, smooth brome, goldenrod
 - Invasive Exotic Plants
 - Others, certainly more than we know



Vegetation Mgmt - continued

- Habitat for voles and mice
 - A major problem in grassy fields
 - Voles, esp. w/ tall fescue, low areas
 - Burrow, eat roots and bark
 - White-footed mice, any tall grass, esp. WSG
 - Nest in shelters, chew bark



Vegetation Mgmt - continued

- Vegetation Management
 - Mowing, weed trimming, etc.
 - Can improve conditions for further weed control and planting, prevent seed formation, reduce rodent habitat, kill some annual weeds, instant gratification
 - Does not kill most weeds, promotes grass sod, can reduce success of subsequent herbicide application on woody plants (e.g., multiflora rose, ailanthus)

Vegetation Mgmt - continued

- Tillage – plowing, disking, roto-tilling
 - Alternative to herbicide
 - Good for natural regeneration or direct seeding or cover crop establishment
 - Increased potential for erosion
 - Exposes existing weed seeds in soil and is receptive to newly deposited seeds

Vegetation Mgmt - continued

- Herbicide
 - Often appropriate, usually in combination of other techniques
 - Investigate each product before using
 - The appropriate “use” must be on the product label (typically a type of site, listed at beginning of label or under General Information) such as “Tree Plantations”, “Forest”, “Non-Crop”

Vegetation Mgmt - continued

- To Apply Herbicide
 - You must be a State-licensed commercial pesticide 1) business, and 2) applicator
 - In a category relevant to what kind of site you are working, (e.g., Forest, Ornamental)
 - Appropriate Education and/or experience, pass test, carry insurance
 - Opportunity - few contractors doing this, either for tree planting or invasive plant control

Vegetation Mgmt - continued

- Pre-Emergent Herbicide
 - Kill germinating weeds
 - Mostly used just prior to, or soon after, tree planting or direct seeding, lasts several months
 - Pendimethalin (Pendulum)
 - Simazine (Princep)
 - Flumioxazin (SureGuard)
 - Oxyfluorfen (Goal)
 - Sulfometuron (Oust)- use with caution

Vegetation Mgmt - continued

- Post-Emergent Herbicide
 - Kill established plants
 - Glyphosate (Roundup, others) non-selective
 - 2,4-D (many brands) broadleaf weeds
 - Triclopyr (Garlon) broadleaf & woody plants
 - Dicamba (Vanquish, Banvel) broadleaf & woody
 - Clopyralid (Transline, Stinger) broadleaf weeds
 - Metsulfuron (Escort) broadleaf & woody plants
 - Sethoxydim (Vantage, Poast) grasses only
 - Fluazifop (Fusilade) grasses only

Vegetation Mgmt - continued

- Herbicide Methods
 - Cut and treat stumps – trees & shrubs
 - Basal Bark application – trees & shrubs
 - Targeted spraying – to specific plants
 - Broadcast spraying – spray entire area
 - Spray strips or spots – where trees are or will be planted

Three good ways for long-term vegetation mgmt in field plantings

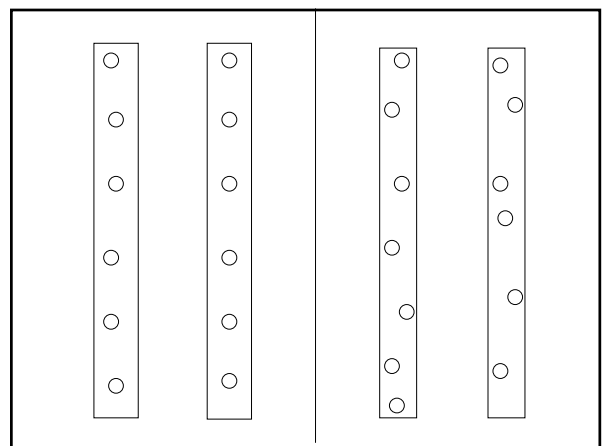
- Allow grass and broadleaf cover, but spray and maintain weed-free strips or spots, mow in between.
- Convert whole field into less competitive, less vole-prone cover crop.
- Best - Combine cover crop & weed-free tree rows (& mowing between, if needed).

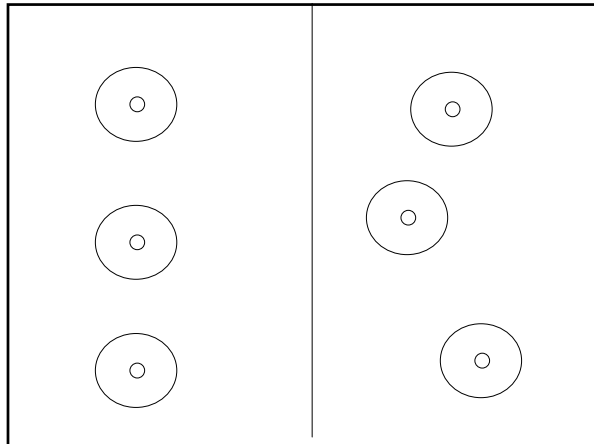
Strip or Spot Spraying

- Strips are better than spots
 - Easier to properly calibrate application.
 - Easier and more cost effective to maintain and re-apply.
 - Creates more weed-free area for tree roots to grow in, and less weed encroachment
- Make strips at least 3 ft. wide initially
- Make spots at least 5 ft. diam. or 4 x 4 ft. square
- Wider is better, should make wider later as tree roots can utilize more area

Strip or Spot Spraying - continued

- Spray and mow field in summer as needed to create a well-prepared area.
- Spray strips in September or October before spring planting. Better than spraying in spring.
- Glyphosate & Pendulum or glyphosate and low rate of Oust





Strip or Spot Spraying - continued

- After tree planting, maintain sprayed area in mostly weed-free condition during growing season, with some weed growth in fall.
- Thistles often appear if not treated 2nd year.
- Re-spray every year for at least 3 years, including the year of planting.
- The longer you keep spraying, and the greater the area you spray, the better for the trees, until full crown closure.





Growth at 8 yrs.

Design

- Planting stock
 - Bare root (1-0 or 2-0) mostly used
 - Small container (plugs, & up to 5 gal)
- Species
 - Native to State (& locality)
 - Adapted to site conditions
 - Grows fast, tall, forms canopy
 - Diversity, as many spp. as practical

Design - continued

- Spacing-Depends on size, type of stock
 - Min. 6' for shrubs on streambank
 - Typical ~10' for bare-root seedlings (436/ac)
 - Up to 20' for large container saplings (109/ac)
- Layout
 - Align for appearance, habitat & maintenance
- Design for maintenance – spacing, alignment, marking, shelters, etc.

Planting Process

- Hand
 - Dibble/Planting bar
 - Shovel
 - Mattock/Hoedad
- Machine
 - Auger
 - Tractor-pulled transplanter
- Regardless of method, use proper plant handling & planting techniques

Planting Process - continued

- Season
 - Mostly in Spring (March & April), esp. w/bare-root stock or plugs
 - Fall or late Spring (May) only if larger stock (container or B&B)

Deer Protection

- Check on deer activity near site, if any doubt they are probably there in sufficient numbers to cause damage
- All methods have key points to using them successfully. Investigate.
- Some methods may also reduce damage from rodents, rabbits

Deer Protection - continued

- Repellents
 - Various kinds, based on odor or taste
 - If done right can work well for a while on small areas
 - Need periodic re-application
 - Due to repeat treatments, more expensive than other methods

Deer Protection - continued

- Fencing
 - Materials – woven wire, electrified wire, plastic mesh
 - Various ways to construct/align
 - If done right, can work very well in small areas
 - Still needs checking and maintenance

Deer Protection - continued

- Tree Shelters
 - Most are plastic 3–5" diam.
 - 2-5 ft. tall, mostly 4 or 5 ft.
 - Wooden stake, usually 1"x1" oak
 - Work well in any size area, if done right
 - Marks seedling locations
 - Protection from mowing and herbicide
 - Need checking, maintenance and removal

Protection from Voles & Mice

- Keep area near trees free of grasses and broadleaf weeds
- Mow grass in-between trees low to reduce mouse habitat, or
- Convert site to different vegetation
- Monitor for these rodents
- Rodenticide if damage likely to be heavy – using all precautions

Maintenance

- The most overlooked aspect
- Vegetation mgmt
 - Mowing, spraying, etc.
- Tree shelter tending and removal
- Fence tending and removal
- Monitor for rodents
- Check for and fix any problem
- Survival monitoring and replanting

Control of Invasive Exotic Plants

- Increasing public and governmental appreciation of the problem
 - Increasing demand for contractors
- Proper identification is essential
 - Know native plants as well as exotic
- Learn options for Integrated Vegetation Management (IVM, a type of IPM)

Invasive Exotic Plants, continued

- Some possible methods of control
 - Don't Plant Invasive Exotic Species!
 - Biological Control
 - Cultural Control
 - Pulling or digging
 - Mowing or cutting
 - Grazing
 - Heavy equipment
 - Herbicide

Invasive Exotic Plants, continued

- Review of handout materials on invasive exotic plant identification, plants not to plant, and herbicides.

Further Information

- <http://na.fs.fed.us/pubs/>
- www.naturalresources.umd.edu/Publications.cfm
- www.fws.gov/ChesapeakeBay/Bayscapes.htm
- <http://plants.usda.gov/index.html>
- <http://weeds.cas.psu.edu/Invasive%20plants.html>
- www.invasivespeciesinfo.gov/
- www.ma-eppc.org/

