

Seedling Tree Workshop

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 Presented by:
 Douglas County Conservation District
 Colorado State Forest Service
 USDA-NRCS
 United States Department of Agriculture
 Natural Resources Conservation Service
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What Is The Purpose Of Your Windbreak?

- Protection from cold winter winds
- Snow control
- Protection from hot dry summer winds
- Screen/barrier
- Wildlife habitat

How Windbreaks Function

Fig. 3. Schematic representation of turbulence in the wake and in the quiet zone windbreak. From Raine (1974).

Area Of Wind Protection

- 10H rule
 - Measured from mature height of tallest component
 - Protected area is within 10 times that height
 - 20 foot tree gives 200 feet of protection

Windbreak Density

Depends on:

- Growth pattern of tree/shrub
- Placement of trees/shrubs

Open Wind Speed 20 mph Deciduous 25-35% density					
# of trees/shrubs	511	1041	1511	2041	3041
Miles per hour	10	13	16	17	20
% of open wind speed	50%	65%	80%	85%	100%

Open Wind Speed 20 mph Conifer 40-60% density					
# of trees/shrubs	511	1041	1511	2041	3041
Miles per hour	5	10	13	15	19
% of open wind speed	30%	50%	60%	75%	95%

Open Wind Speed 20 mph Multi Row 60-80% density					
# of trees/shrubs	511	1041	1511	2041	3041
Miles per hour	5	7	13	17	19
% of open wind speed	25%	35%	65%	85%	100%

Open Wind Speed 20 mph Solid Fence 100% density					
# of trees/shrubs	511	1041	1511	2041	3041
Miles per hour	5	14	18	19	28
% of open wind speed	25%	70%	90%	95%	100%

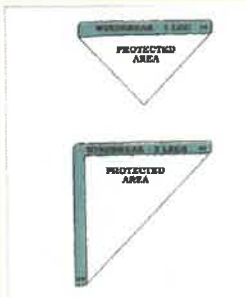
ONE ROW

TWO ROWS

To provide a more dense and uniform windbreak, offering the best protection possible, stagger the rows.

TWO ROW HIGH DENSITY

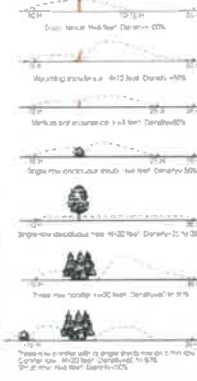
Windbreak Function



- Edge Effect
- Extend planting beyond the area your trying to protect

Figure 8. In some well-considered, multiple-row windbreak systems, a second row provides protection on the back or from around the edge of the protected area.

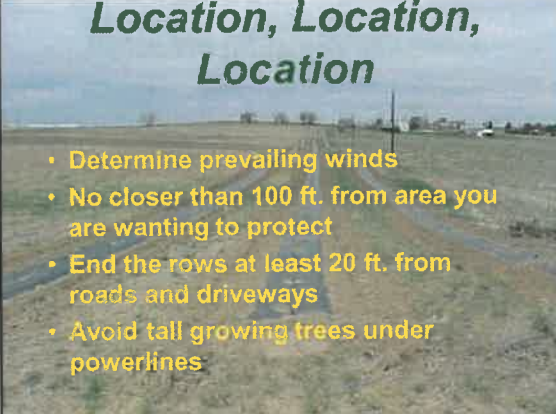
What About Snow?



- A well placed row can keep your driveway clear
- Poor placement will bury it

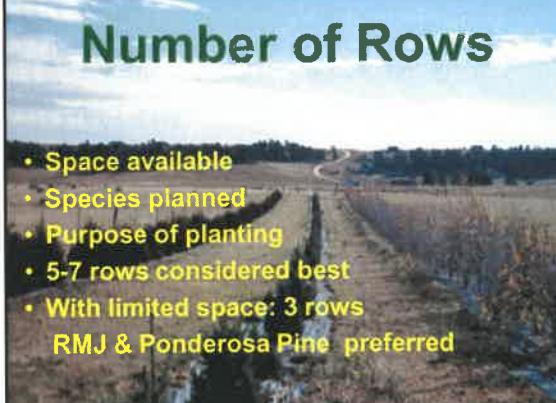
Figure 9. The height and distance of the row from the driveway will affect the amount of snow that will be cleared.

Location, Location, Location




- Determine prevailing winds
- No closer than 100 ft. from area you are wanting to protect
- End the rows at least 20 ft. from roads and driveways
- Avoid tall growing trees under powerlines

Number of Rows



- Space available
- Species planned
- Purpose of planting
- 5-7 rows considered best
- With limited space: 3 rows
RMJ & Ponderosa Pine preferred

Row Spacing



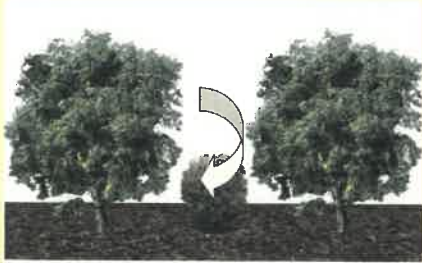
- Between the row spacing
 - Typically 15-20 ft.
 - Room for maintenance
 - Snow storage
 - Cultivation
 - Weed barrier
- In the row spacing
 - Determined by species
 - Crown closure time
 - Competition

Spacing Within the Rows



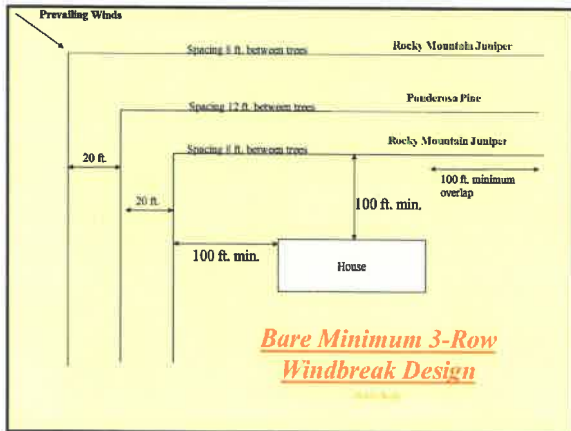
- Shrubs: 4-6 ft.
- Juniper, Cedars: 6-12 ft.
- Pine, Spruce: 8-14 ft.
- Short deciduous trees: 8-12 ft.
- Tall deciduous trees: 8-18 ft.

Can We Mix & Match Species?



Present a uniform wall to the wind

Mixing species in a row is not recommended



Weed & Water Management With Fabric Mulch

- Advantages
 - Weed control
 - No special equipment
 - Reduced time commitment
 - Moisture conservation
 - Once charged it stays
 - Reduced irrigation need
 - Improved survival & growth
- Disadvantages
 - Initial Cost
 - Installation
 - Heat buildup
 - Appearance
 - Rodents
 - Reptiles
 - Longevity

Weed Control For Optimum Survival & Growth

- Cultivation - 3-5 ft. around each tree
- Chemical - limited choices, read label
- Weed barrier
- Bark, wood chips, or pine needles

Moisture

- Garden hose/buckets
- Polypropylene woven weed barrier
- Polymer - absorbs up to 200 times its weight in water
- Drip Irrigation
- Water plants in fall before the ground freezes. Withholding water will not aid plant in acclimating itself to winter, rather it may reduce the plants winter hardiness.

Moisture Conservation

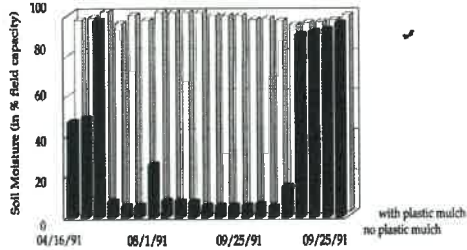


Figure 7: Plastic mulch moisture retention study (High Plains Crossroads Research Station)

Drip Irrigation



- Applies water slowly, right to the seedling
- No waste, fewer weeds
- Easily automated
- Good when quantity of water is limited
- "Snake" drip pipe to allow for movement
- Water test recommended

Drip System Pointers



- Drip irrigation makes and 'onion' shaped wetted pattern under the soil
- Use multiple emitters as trees get larger

Drip System Pointers

- Make sure your drip emitters are placed uphill of the seedling not downhill.



They're Here!



Bare-Root Seedling Care

- Recharge moisture in package
- Package contains sawdust to hold moisture
- Keep in a cool shady spot, garage, crawl space, or north side of house, to slow bud break



Bare-Root Seedling Care

- Refrigerators are great for storing bare root stock
- Keep plants in package until ready to plant, or plants can be "Heeled in" if planting will be delayed
- Don't soak seedlings in water overnight

"Heel In" Bare-root stock



- Pick a spot in the cool shade
- Dig a hole large enough to cover entire root system
- Place root system in hole and cover
- Water periodically
- "Heeling in" trees and shrubs is a short term option
- Drawback is plants can start growing
- Plant them in permanent location before bud break

Potted & Tubed Seedling Care

- Recharge soil moisture in containers
- Keep seedlings in their pots and tubes until planting day
- Keep in a cool shady spot, garage, crawl space, or north side of house to slow bud break

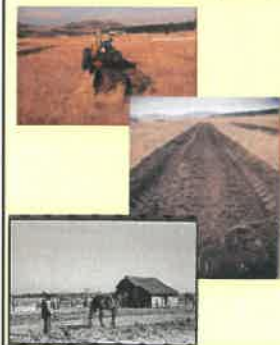


Potted & Tubed Seedling Care

- Seedlings can be planted in a temporary holding nursery, garden if planting is delayed
- Seedlings should be planted from the holding nursery ASAP before temperatures get too hot
- Don't keep seedlings in water overnight

Site Preparation

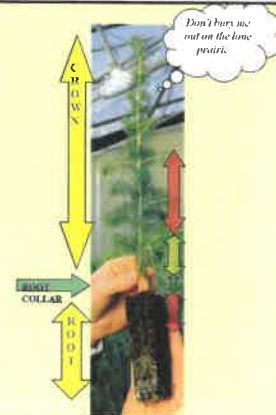
is the first step in the planting process and the most overlooked



- Increases survival rate
- Loosening of root zone
- Improves water infiltration
- Reduces competition for moisture from weeds
- Repeated mowing of competing vegetation is **NOT** an option.
- Plowing site in fall is ideal for heavier soils.
- Plow eight foot wide strips when using weed barrier.

Planting

- Parts of the seedling
 - Crown
 - Root collar
 - Root system
- Don't bury too much stem
- Don't expose root system
- Don't plant in too shallow or too deep of a hole



Bare-root Planting Tips

- Minimize root exposure to sunlight
- Carry in a bucket of slurry while planting
- Plant same as potted plants



Hand Planting

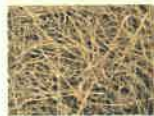
- Dig a \$5 hole for a \$1 tree
- Dig a wide hole so the roots can spread out
- Plant the same depth as the soil level of the seedling
- Backfill with soil, 1/3 of amendment, hydrated polymer and firm by hand



Hand Planting



- Water after planting
- Don't stomp on soil after watering, it will compress soil too much
- Mulch around tree



Your Hard Work Will Remain for Generations To Come!!!



Seedling Tree Inventory:
<http://csfs.colostate.edu/seedling-tree-nursery/seedling-nursery-inventory/>

Trees for Conservation - A Buyers guide:
<http://static.colostate.edu/client-files/csfs/pdfs/08byrqd-www.pdf>



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