Seedling Tree Workshop

***Presented by*:**

Douglas County Conservation District

Colorado State Forest Service

USDA-NRCS

Natural Resources Conservation Service

January 24, 2018

Helping People Help the Land

An Equal Opportunity Provider and Employer

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

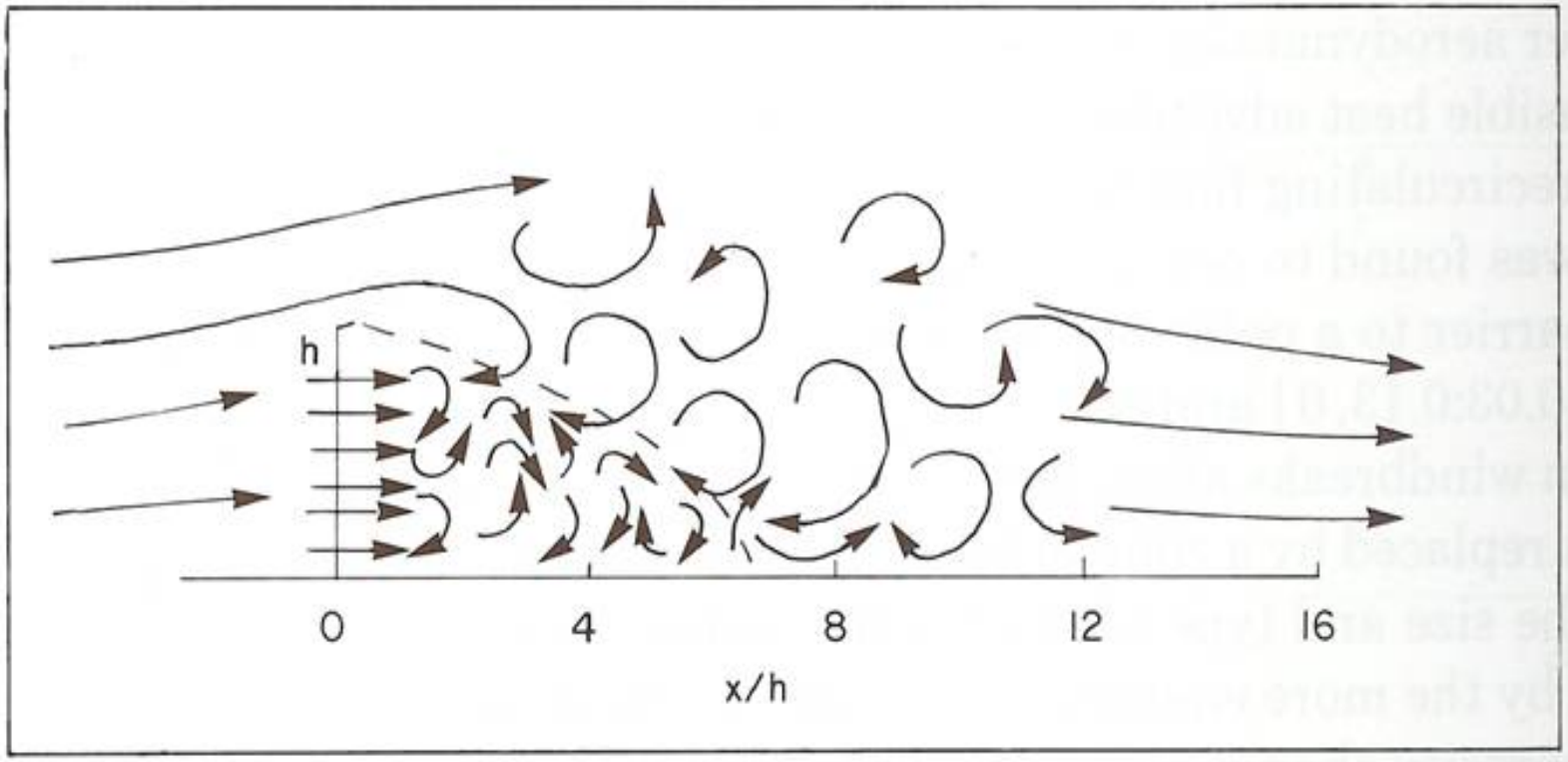
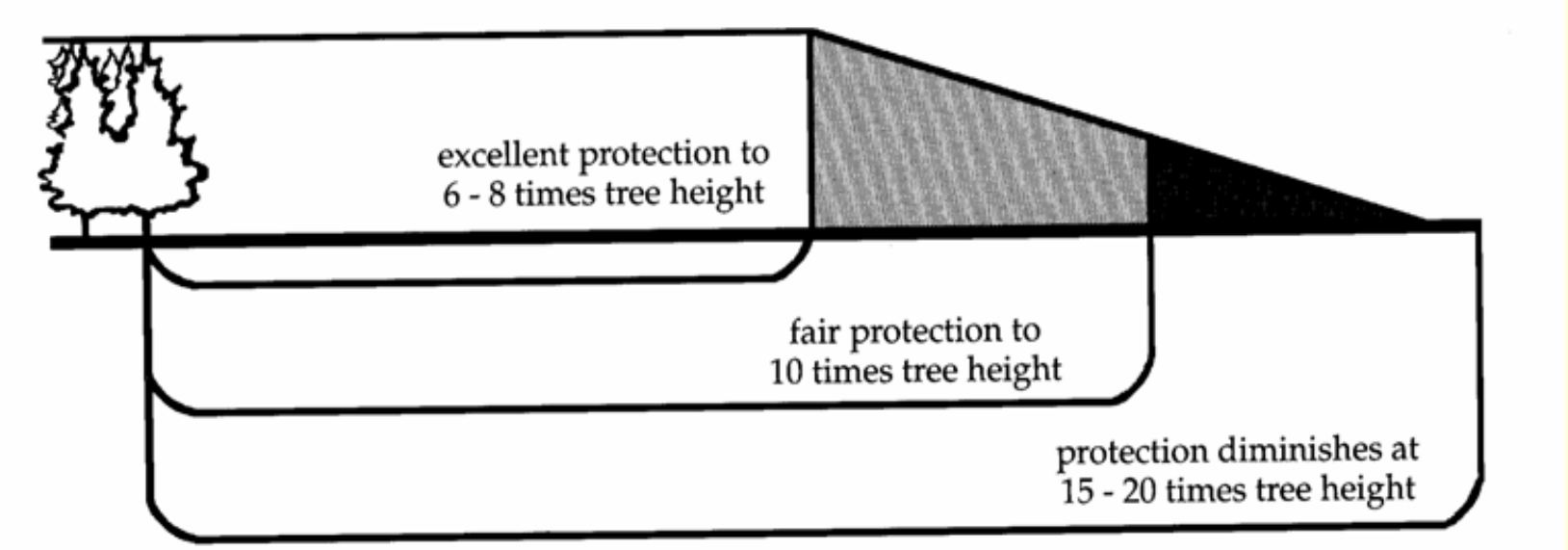


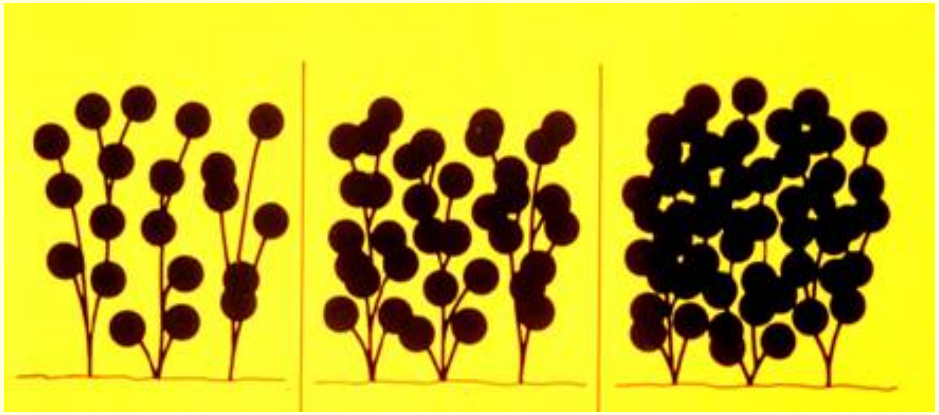
Fig. 3. Schematic representation of turbulence in the wake and in the quiet zone windbreak. From Raine (1974).

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

H distance from windbreak	5H	10H	15H	20H	30H
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

H distance from windbreak	5H	10H	15H	20H	30H
Miles per hour	6	10	12	15	19
% of open wind speed	30%	50%	60%	75%	95%

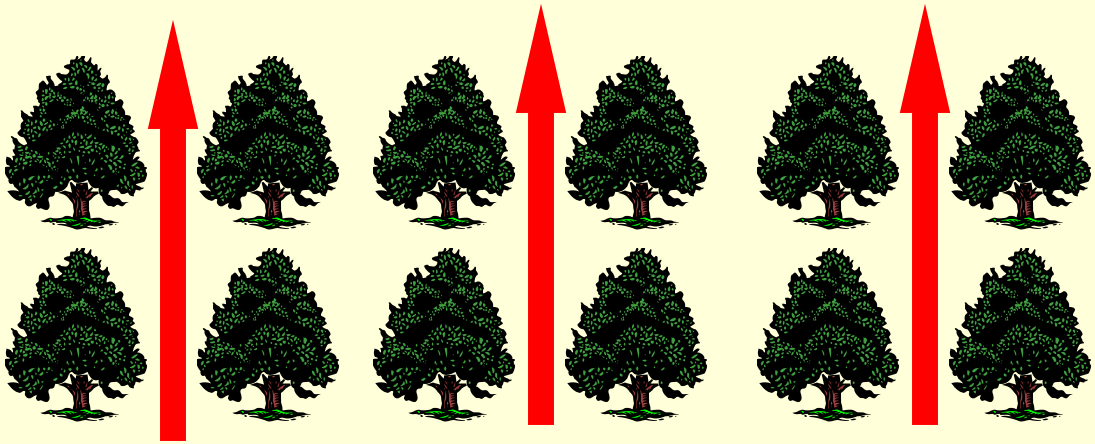
Open Wind Speed 20 mph
Multi Row 60-80% density

H distance from windbreak	5H	10H	15H	20H	30H
Miles per hour	5	7	13	17	19
% of open wind speed	25%	35%	65%	85%	95%

Open Wind Speed 20 mph
Solid Fence 100% density

H distance from windbreak	5H	10H	15H	20H	30H
Miles per hour	5	14	18	19	20
% 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

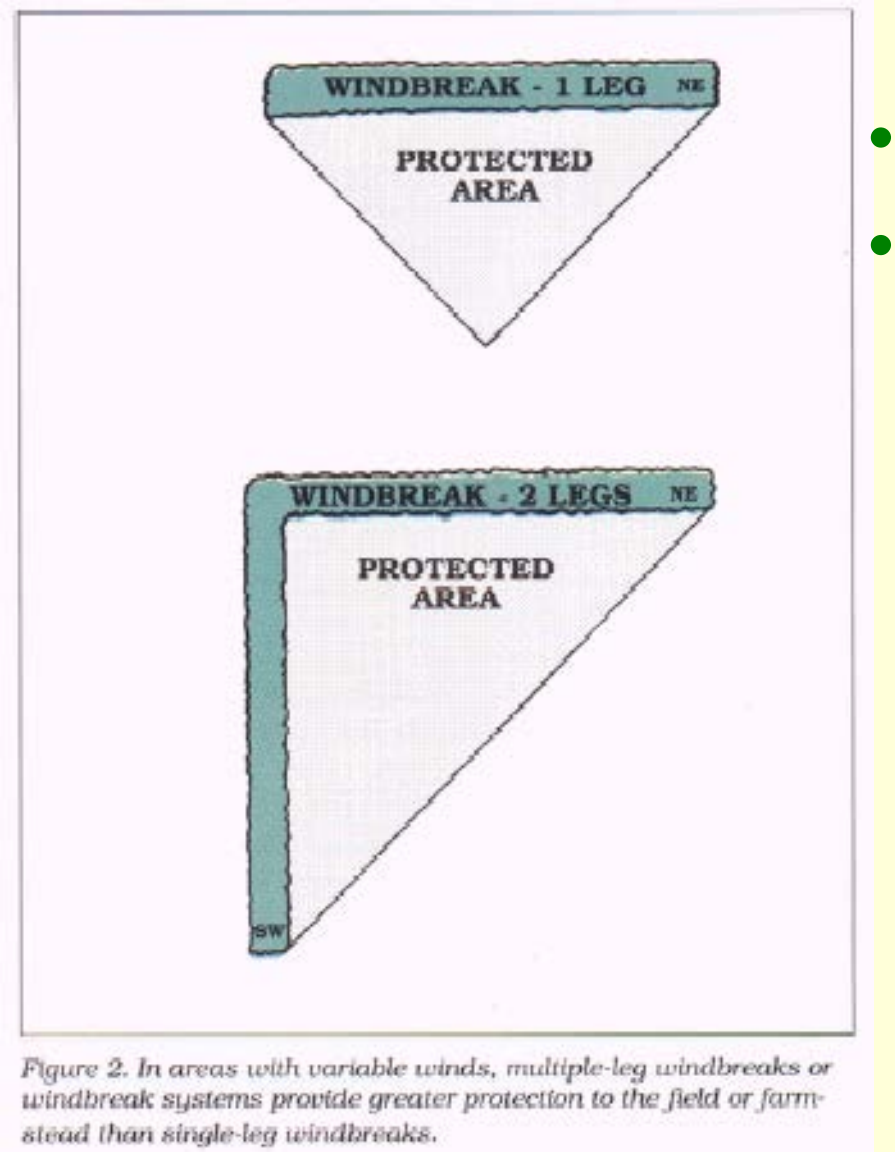


Figure 2. In areas with variable winds, multiple-leg windbreaks or windbreak systems provide greater protection to the field or farmstead than single-leg windbreaks.

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

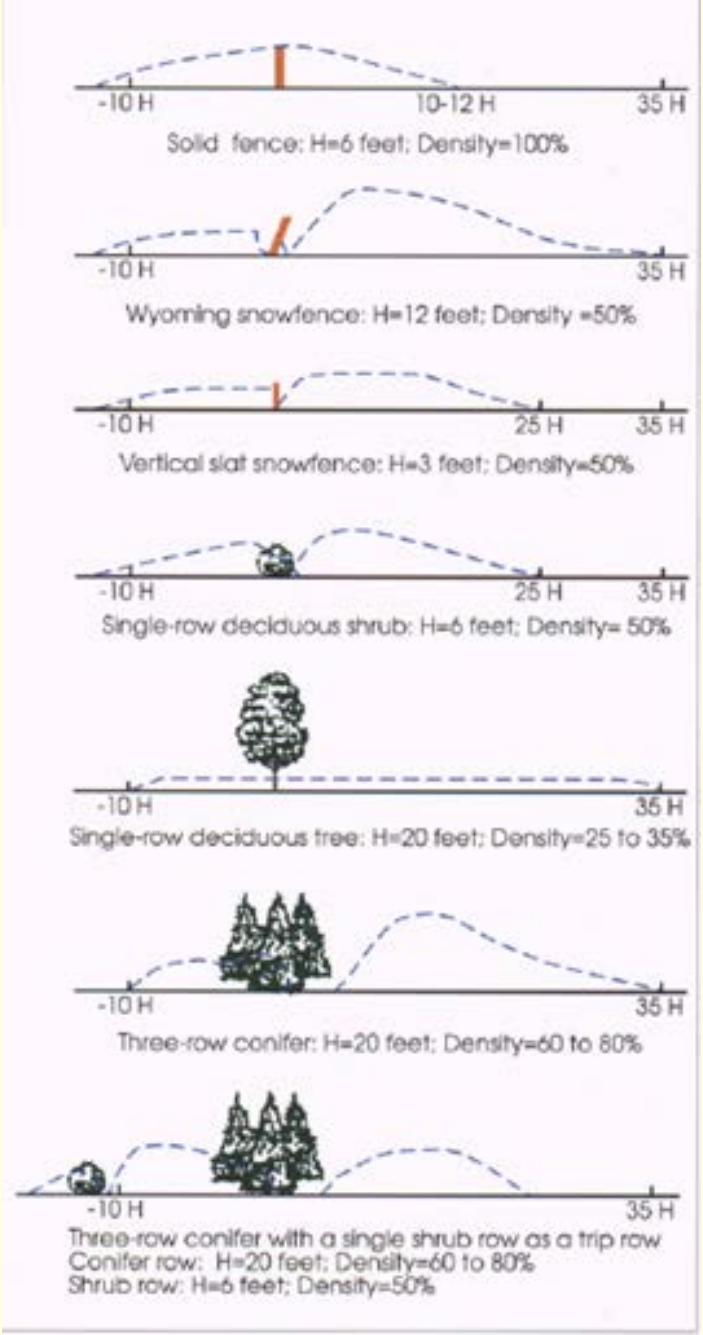


Figure: The height and density of the snow fence or windbreak will determine how much snow can be stored in the system.

What About Snow?

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

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

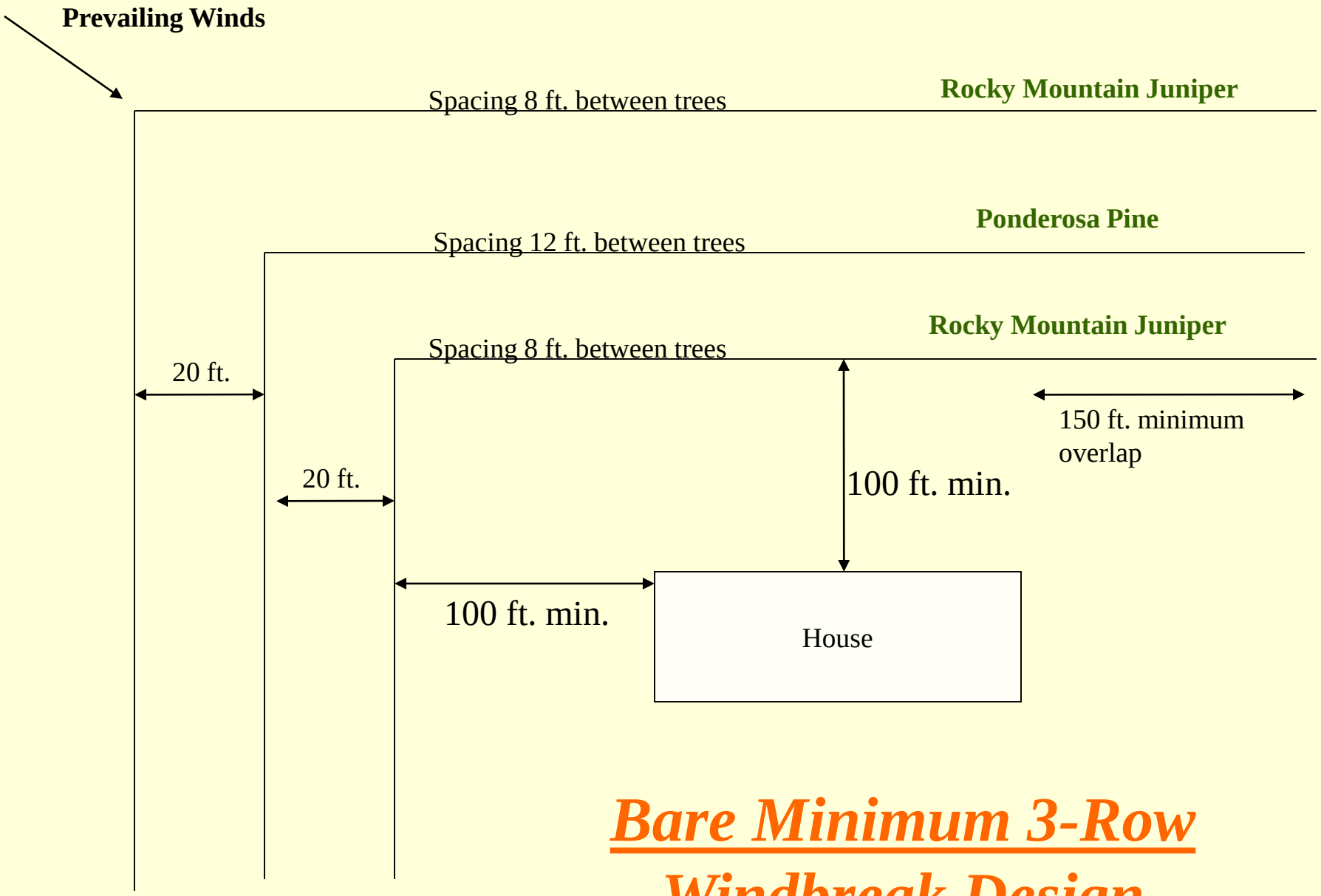
Spacing Within the Rows

- 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?

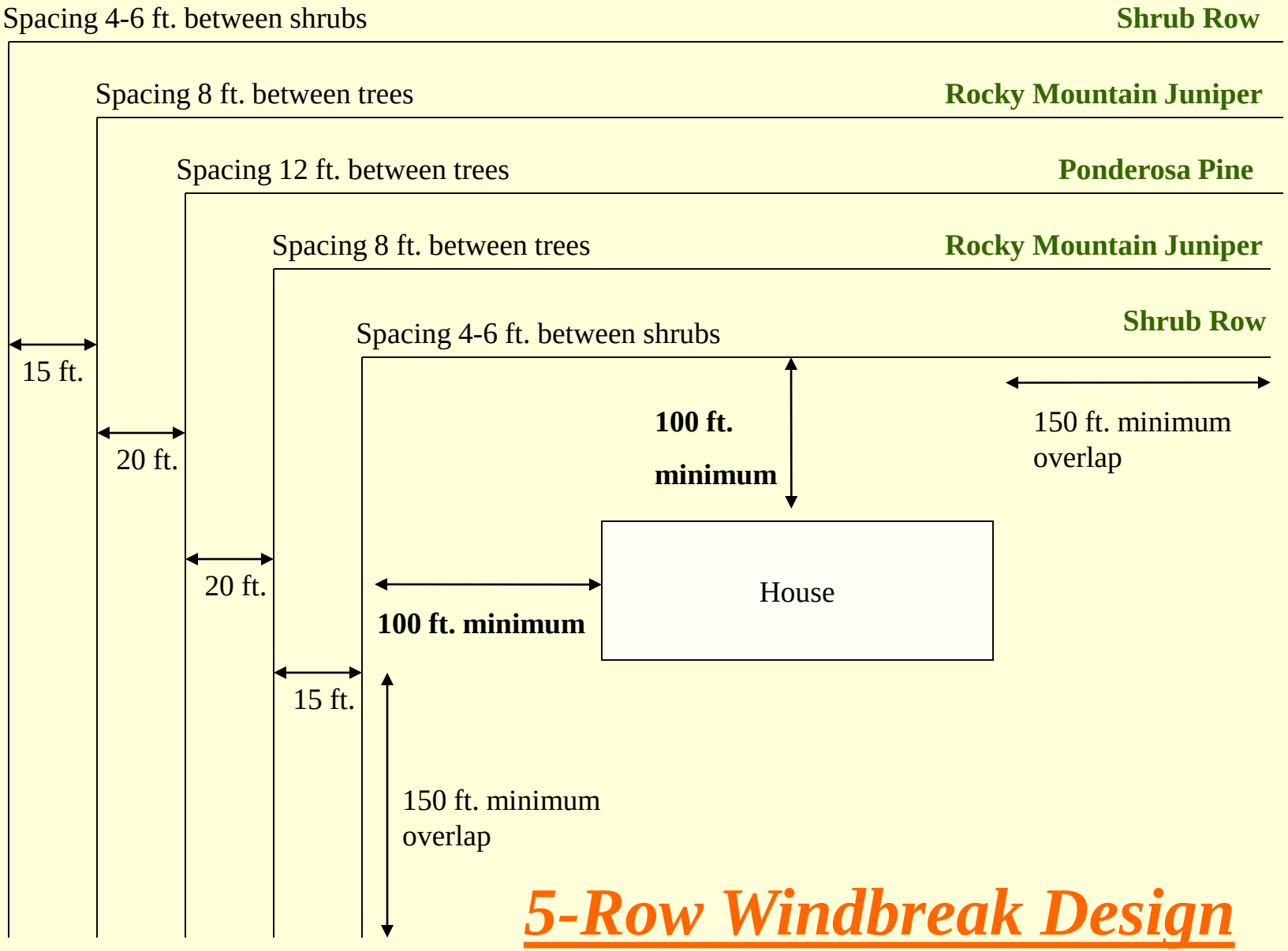
Present a uniform wall to the wind

Mixing species in a row is not recommended



Bare Minimum 3-Row Windbreak Design

Not to Scale



5-Row Windbreak Design

Not to Scale

Weed & Water Management With Fabric Mulch

- Advantages
  - Weed control
    - No competition for moisture from surrounding weeds and grasses
    - Once the weed barrier is put down, no need to apply mulch every year
  - Moisture conservation
    - 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

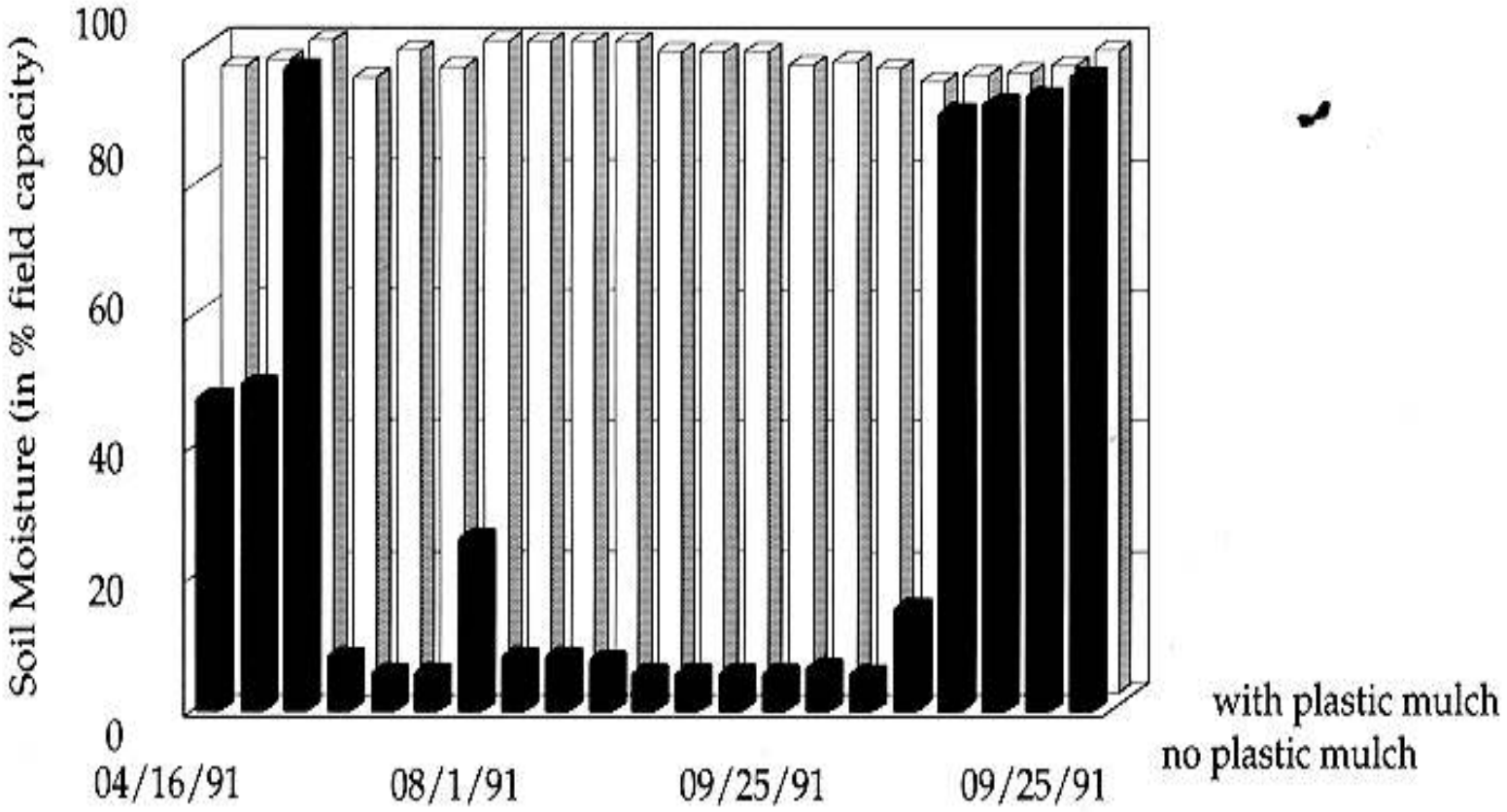


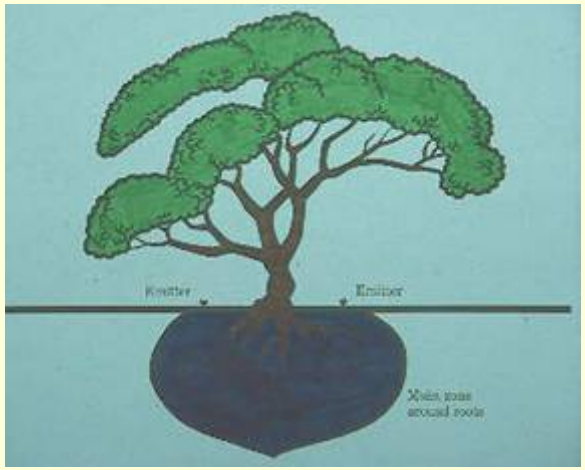
Figure 7: Plastic mulch moisture retention study (Highplains Grasslands Research Station)

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

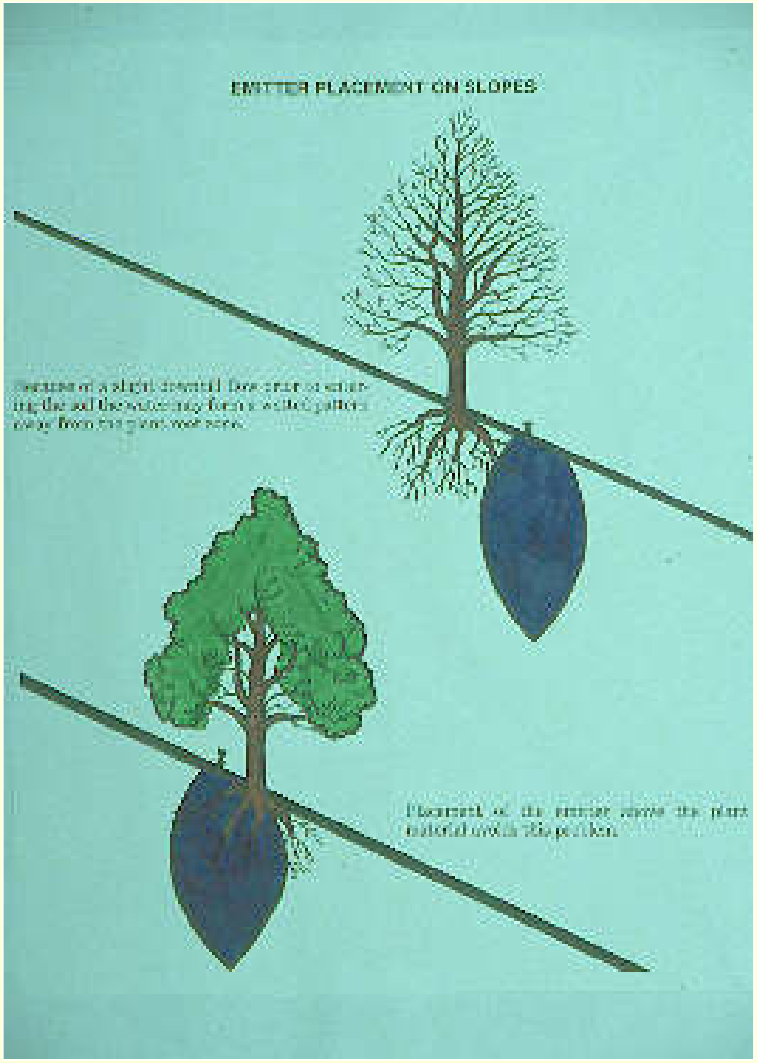
- Use multiple emitters as trees get larger



- Drip irrigation makes an ‘onion’ shaped wetted pattern under the soil

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 or 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

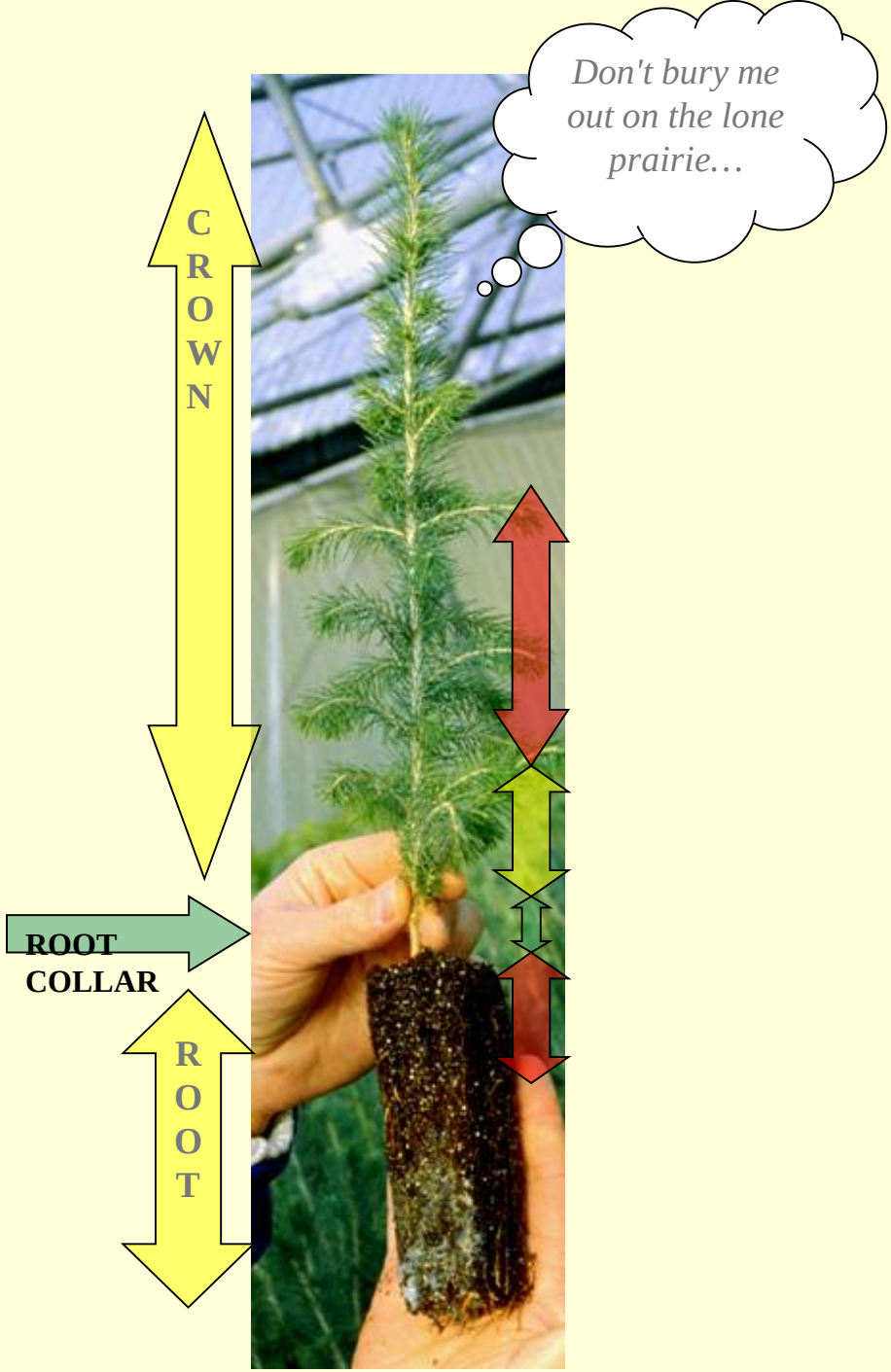
Site Preparation

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**
- **Mowing competing vegetation is recommended**
- **Plowing or digging the site in fall is ideal for heavier soils.**
- **Plow eight foot wide strips when using 6’ weed barrier.**

Planting

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



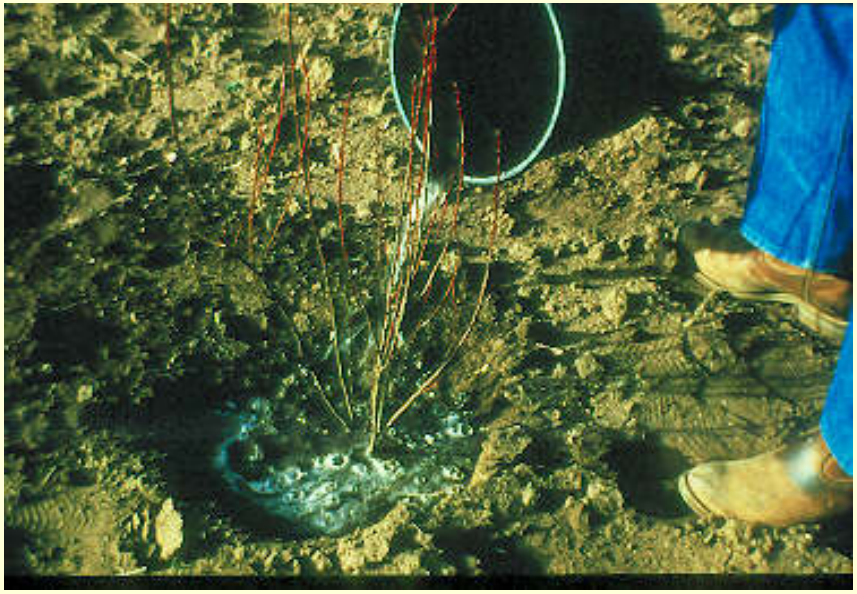
Bare-root Planting Tips

- Minimize root exposure to sunlight and air
- 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 an 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 plant 3-4 inches deep and 1 to 3 feet out from plant
- Keep mulch from touching the tree

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