Colorado State Forest Service

Kamie Long
District Forester
970-248-7325
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15 State Forest Service Districts Statewide
Order Seedlings from CSFS Cooperators

Grand Junction District by County:

- **Delta** - CSU Tri-River Extension office : 970-874-2195
- **Garfield** – Conservation District : 970-404-3439
- **Mesa** - CSU Tri-River Extension office : 970-244-1834
- **Pitkin** – call Garfield County
- **Rio Blanco** – Conservation District : 970-878-5628
Seedling Pick-up Dates

• Glenwood Springs – May 3, 2017
  ◦ Glenwood Springs Service Center
  ◦ 258 Center Drive; (970) 404-3439

• Grand Junction – May 4, 2017
  ◦ Mesa County Fairgrounds - 8 am to 6 pm
  ◦ 2785 Highway 50; (970) 244-1834
  ◦ Pick up beneath stadium bleachers

• Delta – May 3, 2017
  ◦ Bill Heddles Rec. Center –
  ◦ 530 Gunnison River Drive; (970) 874-2195
Conditions to Seedling Sale

• Can not be used for landscaping
  ◦ Used for **Conservational Purposes**
    • Erosion control, Wildlife habitat, Plant diversity

• Payment must be included with order and submitted by April 14\(^{th}\), 2017

• No cancellations or refunds

• No guarantees of survival of stock

• If trees ordered are not available – a refund or substitution is allowed
The CSFS Nursery Grows Over 50 Species of Trees and Shrubs

Seedlings are available as:

- **Bare root** (25/species)
- **Large Tube** (30/species)
- **Small Tube** (30/species)
- **Tray** (50/species)
- **Extra Large Potted** (4/species)
Bare root Seedlings –
Deciduous: 10-30” top height * Conifer: 5-12” top height

- Lots of 25 per species
- 1–2 yrs old, depending on species
- Seedlings are wrapped in plastic, filled with sawdust
- Keep moist by pouring water into the wrapped bundle
- Do not open bundle until ready to plant or heel-in
Large Tube - Potted Seedlings:
5-12” top height * 2.0”x 7” tube

- Lots of 30 per species
- 1-2 years old
- Potted seedlings do well if you can provide adequate water
  - Received plenty of water at the nursery
- These seedlings do well because the roots are not disturbed when planting
Small Tube Potted Seedlings:
3-6” top height * 1.5”x 8” tube

- Lots of 30 per species
- 1-2 years old
- Seedlings are smaller due to the smaller container they are grown in
- Have less root volume than regular potted
Tray Potted Seedlings:
5-12” top height * 2.0”x 6” cell

- Lots of 50 per species
- 2-3 years old
- Potted seedlings do well if you can provide adequate water
  - Received plenty of water at the nursery
Extra Large Potted Seedlings:
10-12” top height * 6”x7” pot

- Lot of 5 per species
- 2-3 years old
- Available:
  - Many species available
Perennial Wildflowers and Grasses:
Available in multiple sizes; species vary year to year

- Sold in groups of 30 plants in large tubes
  - 1 year old
  - Can mix and match species (based on availability)
- Also sold in Extra Large pots and 50 cell trays
  - Limited species selection

Coreopsis
Coneflower
Lemon beebalm
Seedling Pick Up Tips:
Create a Plan to Increase Seedling Survival

- Objectives for the planting
- Limiting factors of your site
- Species best suited for your project
- Site preparation and seedling handling
- Correct planting procedures
- Amount of water for the seedlings
- Control of competing vegetation and wildlife
Objectives for Planting Trees

Do you need a Windbreak? To create Wildlife Habitat?

*Plant Diversity  *Erosion Control  *Reforestation
*Visual Screen  *Noise Barriers  *Christmas Trees
Objectives and Long-term Expectations

- What do you expect to get or to see from the planting?
- Answer this question prior to seedling species selection
- Choose species whose characteristics meet the expectations
- Choose species that can handle your site limitations

**Example Characteristics:**
- Fast growing
- Dense habit
- Long living
- Fruit producing
Objective: Windbreak
Expectation: Block wind year round

- Junipers and Redcedars make great windbreaks
- Plant Characteristics
  - Retain foliage all year and all the way to the ground
  - Grow slowly
  - Do not offer much in the way of flowers or fruit
Objective: Snow Fence
Expectation: Protect road from snow

- Type of Windbreak used to capture and control blowing snow
  - What species will meet your expectations and site limits?
Limiting Factors

- Every site has factors that can limit a seedling's potential
  - Soil nutrient levels
  - Soil pH ~ soil acidity affects nutrient uptake
  - Light intensity
  - Space availability
- You must determine the limiting factors before species selection
- If any of these factors are not compatible, seedling mortality can occur
In Order To Have A Successful Planting You Must Deal With These Three Factors!

**Water:** How will water be available to the trees?

**Weeds:** How will competing vegetation be controlled?

**Wildlife:** How will you prevent / discourage wildlife?
Species Selection

- This is one of the most important investment decisions for the homeowner
- Must consider your Limiting Site Factors
- Match the Limiting Factors with the plant characteristics

- Choosing the right species can make the difference between a successful planting and an unsuccessful one
- The right species may not be your preferred species but is based on the site
The Buyer’s Guide is available on the Internet.

Species Characteristics:

- Elevational Range
- Drought Resistance
- Cold Hardiness
- Growth Form
- Size
- Soil Conditions
- Insect/Disease issues
- Wildlife Value
- Seasonal Color

Plants That Do Well on West Slope

- New Mexico Privet
- Lilac
- Buffaloberry
- Austrian Pine
Site and Seedling Preparation

- Site Preparation
- Fertilization
- Care and Storage
- Seedling Survival Supplies
  - Mulch and Polymer
  - Protection from Wildlife and Sun
First Step: Site Preparation – Before Seedlings Arrive!

- What it does:
  - Enhances soil’s ability to catch and store moisture
  - Reduces grass and weed competition
  - Aerates soil by breaking down clumps of soil
  - Warning: If you disturb the soil, something will grow

Untilled portion of field. The Before.
Amend Poor Soils with Organic Matter

- Roots need nutrients to thrive
- As organic matter breaks down, it provides nutrients
- Till in 3” of organic matter 10” deep
- Composted materials work best

Rows of mulch at Mesa County Landfill – Organic Materials Composting Facility
Site Preparation:
Rototiller

Walk behind Rototiller

Rototiller behind ATV
Site Preparation: Aerating the Soil

Plowing or Disking

Old fashion plowing
Site Preparation: Basic Tools

Shovels

Hand Power Auger
Site and Seedling Preparation

- Site Preparation
- **Fertilization**
- Care and Storage
- Seedling Survival Supplies
  - Mulch and Polymer
  - Protection from Wildlife and Sun
Fertilization

• Do not add fertilizer (a chemical mixture) to soil when planting unless fixing a known problem
  ◦ Fertilizer could ‘burn’ the fine, absorbing roots

• Determine soil nutrient levels
  ◦ Soil tests done by private companies
  ◦ Only fertilize with the lacking minerals

• **Best Option:** during site preparation, amend poor soils with organic matter to add nutrients (not with chemicals)
Site and Seedling Preparation

- Site Preparation
- Fertilization
- Care and Storage
- Seedling Survival Supplies
  - Mulch and Polymer
  - Protection from Wildlife and Sun
Care Prior to Planting is Critical

- These are key:
  - Cool (under 50°F)
  - Moist
  - Out of direct sun

- Keep roots Moist but not Wet
- Do NOT let the roots dry out
Never Expose the Roots for More than a Few Minutes!

- Fine roots are delicate and very small (hair like)
- They will die, and so will the plant, if exposed to air for a period of time
- Bare root seedlings need to be planted within one week
Do Not Leave the Roots Immersed in Water

- You can suffocate roots by leaving them immersed in water.
- Keep seedling roots moist by carrying them in a bucket of polymer, sawdust, or some kind of soil mixture.
If You Can Not Plant Your Bare roots Within 7-10 Days…

“Heel” them in:

- Dig a hole or trench in the shade, spread the trees and roots out
- Cover roots with dirt and then water. **Do not heel in seedlings for more than two weeks**
- If left in the soil the roots can get snarled and difficult to separate
Site and Seedling Preparation

- Site Preparation
- Fertilization
- Care and Storage

**Seedling Survival Supplies**
- Mulch and Polymer
- Protection from Wildlife and Sun
Seedling Survival Supplies

- Sold **only** by the State Forest Service
- Not sold by CSU Extension – only Seedlings are
- Pick up supply order when picking up seedlings on delivery day

2017 Seedling Survival Supplies Order Form

NAME: __________________________ PHONE: ____________________(day)
ADDRESS: __________________________
CITY: __________________________ STATE: __________ ZIP: __________

CHECK your preferred Spring Delivery Location (same location as your tree delivery):

- □ Delta
- □ Grand Junction
- □ Glenwood Springs
- □ Meeker

*Please Note: All survival supplies will be delivered with your trees if your order is received by April 21, 2017. Otherwise, YOU must arrange pickup. We do not ship any products.*

All prices include 2.9% state sales tax.

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<th>Item</th>
<th>Unit Cost</th>
<th>Qty</th>
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<td>A. Drip Irrigation, 30 Tree Kit</td>
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<td>B. Drip Irrigation, 100 Tree Kit</td>
<td>$350.00</td>
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<td>C. Polymer Slurry Dp. Half Pound</td>
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<td>D. Polymer Soil Additive, Half Pound</td>
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<td>E. Tree Guards, 30 Tree package &amp; stakes</td>
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<td>F. Tree Guards, 25 Tree package &amp; stakes</td>
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<td>H. Weed Barrier Fabric, 6 ft. x 300 ft. roll</td>
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<td>L. Tree Shades, 25 Tree package &amp; stakes</td>
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Total = __________

DISCOUNT OFFERED BELOW IS ONLY FOR THOSE PICKING UP SUPPLIES ON TREE DELIVERY DAY:

<table>
<thead>
<tr>
<th>Total (from above)</th>
<th>10% Discount (only applies for those orders Received BY March 24, 2017!)</th>
<th>2.9% state sales tax already included</th>
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TOTAL Payment Due =

SEND CHECK WITH ORDER PAYABLE TO:
Colorado State Forest Service
2764 Compass Dr., Suite 101
Grand Junction, Colorado 81506
970-248-7325

[http://csfs.colostate.edu/districts/grandjunction-district/grandjunction-seedling-trees](http://csfs.colostate.edu/districts/grandjunction-district/grandjunction-seedling-trees)
Mulch and Polymer

- Need to consider whether or not you will use Polymer or Mulch when planting your seedlings
- More information to come on Mulch
Polymer

- Absorbs between 200 - 400 times its weight in water
- Mixed with soil around the roots, retains moisture in the root zone
- 95% of the water in polymer is available to the plant
Tree Guards: Protect from Wildlife

- Effective against deer, rabbits, and rodents
- Chicken wire tubes work, but do not decompose
- Need to be monitored so they do not girdle the trees if the plastic is not decomposing
Tree Shades: Protect from Sun

- Important for conifer seedlings
- While all conifer seedlings will benefit from shade - Fir and Spruce must have shade
- Plastic mesh with wire hoop shades. Work well in our rocky ground
- Place shade on the South & West sides of a seedling
Seedling Care

- **Planting**
  - Timing
  - Depth
  - Bare root seedlings
  - Potted seedlings
  - Planting hole
  - Machine planting

- **Water**

- **Competition**
When is the Best Time to Plant?

- Ideal time to plant trees and shrubs is during the dormant season – Not actively growing
- Plants are dormant after leaf drop (fall) and before bud break (spring)
- Cool weather conditions allow plants to establish roots before rain and heat stimulate new top growth
- Seedlings can begin growing while still in the packaging. Plant as soon as possible.
Proper Depth is Critical!

Rule of thumb: Soil level should be right above the first major root. Ensures roots get oxygen.
Preparing Bare root Seedlings for Planting

- Create a slurry of **soil** in a 5 gallon bucket by mixing a shovelful of soil and water (half of the bucket) or

- Create a slurry of **polymer** in a 5 gal bucket (see directions that come with the polymer)
Preparing Bare root Seedlings for Planting

- Open bundle and place some seedlings in the bucket, submerging roots completely.
  - Keep remaining seedlings in shade/cool
- Plant as quickly as possible
- Seedlings can die if left in this mixture for more than two hours
Preparing Potted Seedlings for Planting

- Do not break the soil around the root ball
- Do not leave seedlings in sun or wind after removal
- Remove from containers just prior to planting
“Dig a $5 Hole For a $1 Tree!”
Don’t Plant too Deep!

- **Step 1:** Dig a hole large enough for **Entire** root system

- **Step 2:** Spread seedlings roots outward and downward keeping root collar at soil level

- **Potted Seedlings = Do Not** disturb the soil around the roots, just place in hole
“Dig a $5 Hole For a $1 Tree!”

A well planted seedling should remain in the ground if gently tugged upward, and it should stand upright on its own.

- Step 3: Backfill dirt and tamp around edges
  - Form a well around the tree to hold water if not using fabric

- Step 4: Water and mulch
Proper Watering

• Water 1-2 gallons after planting, but don’t stomp the soil after watering

• Stomping wet soil will force the air spaces out of the soil. Roots need those air spaces!
Machine Planting - Louther

Can plant 300-500 trees per hour using tree planting plows

CSFS has machines and people for rent

Landowner must provide the tractor
Fabric Machine

- Unrolls the fabric on the machine planted row
- Rider marks tree locations (spray paint) – crew follows, slits fabric, and pulls tree through
- Critical tool when combined with the planting machine in terms of time and labor
Seedling Care

- **Planting**
- **Water**
  - Limiting factors
  - Drip irrigation
  - Flood irrigation
  - No water available
- **Competition**
Watering is Crucial

- Plant growth is directly dependent upon water
- Trees and shrubs require deeper, less frequent watering than grass
- Some species require more water than others
Watering is a Commitment

- Need to do leg work at your planting site
- Determine type of soil and how quickly it dries out
- Use soil probe or ribbon test
- Be aware of weather events
  - Dry periods
  - Heavy rainfall
  - Strong wind
- Plan on providing supplemental water for 2-3 growing seasons
Soil Ribbon Test

- Hold the soil ball in your hand and use your thumb to squeeze it against the middle of your first finger.
- The longer the ribbon the higher the water content available to the plants.
- Goal is for at least One inch long
Watering is a Commitment

- Used to consistent water in nursery
- Right after planting:
  - Water One gallon or a ‘good drink’
- Spring / Fall:
  - By hand/tank – 2 x week
  - Drip system – 3 x week
- Heat of the Summer:
  - May need to increase – listen to your plants!
- Late Fall – leaves starting to turn color
  - Start cutting water back to get them ready for winter
    - Water every 2 weeks till leaves drop off
Winter Watering

- Newly planted seedlings are susceptible to winter drought injury
- Best case scenario: water once a month if no significant snowfall and the ground is not frozen
- Allow water to soak in slowly to a depth of 6-10 in.
Drip Irrigation

- The most efficient way to deliver water to your trees
- Applies water slowly, right to the seedling
- No wasted water and fewer weeds
- Easily automated
- Good when quantity of water or time is a problem
No Supplemental Water

• Reconsider planting if you are not able to provide any water to the seedlings

• Seedlings are accustomed to plenty of water

• If you want to try, plant a native species

• Plant in a natural drainage areas and provide some shade
Seedling Care

- Planting
- Water
- Competition
  - Weeds
  - Wildlife
Competition: Weeds

- Weeds and grass take moisture and sun away from seedlings.
- Use Fabric and/or Herbicide to reduce
  - Read Herbicide label
- Annual maintenance for 3 to 4 years after planting

Mowing is not weed control. The weed’s root system is still intact and mowing may damage the seedling.
Mulch – Many Options

- Fabric mulch
  - Do not allow fabric to touch seedling stem – may wick moisture away
  - Do not allow large air pockets beneath fabric, hot air will build here

- Wood chips, sawdust, straw, peeler shavings
  - Keep to less than 3 inches deep to avoid problems with rodents and diseases
Pros and Cons of Fabric Mulch

- Reduce weeds IF no material is placed on top of fabric
- Conserves moisture
- Allows oxygen flow between air and soil
- Should be removed after 2-3 years and the seedlings are established
- Fabric can constrict around stems as the plant grows
- Does not break down quickly in our soils

Weed barrier fabric only

Fabric with gravel on top
Fabric Mulch

- CSFS sells Woven Polypropylene fabric
- UV resistant for 5 years
- Black to maximize UV resistance
- Water permeable
- Do not allow air spaces between ground and fabric
Using a Herbicide

- Consider a non-selective herbicide such as Roundup
  - Ensures no seedling competition
- Be certain there is no chemical residue that will damage your seedlings
- Read and follow the label
Competition: Wildlife

• Prevent domestic and wild animal damage
  ◦ Species selection
  ◦ Exclusion
  ◦ Repellants

Picture from: Southern Forest Insect Work Conference Archive
If Deer are a Problem in Your Area

- Plant Austrian pine if you want to attract more deer
- Spruce and Juniper can be more successful in deer areas, but still need protection while they are young
Deer and Elk can be the biggest wildlife problem for your planting.

They can require a combination of deterrents to be effective:

- **Physical exclusion**: deer fence, tree guards, electric fence
- **Taste & Smell repellents**: Ropel, egg solids, soap, hair
- **Negative “experiences”**: baited electric fence, dogs
Things to Consider

• Don’t purchase more than you can Plant, Water and Maintain, especially, if this is your first time planting!

• Pick the right tree for your site

• Site preparation is important and can increase your seedling survival rate

• Take your time when planting. Make sure each seedling is properly planted.

• Have a maintenance plan that covers Watering, Weeding and Replacement
A well-planned and maintained tree and shrub planting are a joy for all…
Start Planning for Yours Today!
For More Information
Check Out the CSFS Websites:

CSFS Homepage:
• http://csfs.colostate.edu

Grand Junction District:
• http://csfs.colostate.edu/districts/grandjunction-district/
  • Will post this PowerPoint on the website in the Seedling Tree Program section

CSFS Nursery:
• http://csfs.colostate.edu/seedling-tree-nursery/

Seedling Nursery Inventory List:
• http://csfs.colostate.edu/seedling-tree-nursery/seedling-nursery-inventory/
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