Planting and Transplanting Trees and Shrubs

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Transplanting Topics

- Site Assessment
- When to plant or transplant
  - Bare root planting - Spring and Fall if plants are dormant
  - Container grown, containerized, or B&B – Spring and Fall. Summer also acceptable.
- Soil Preparation
- Digging
- Transporting trees & shrubs
- Replanting in Spring and season long care
- Replanting in Autumn and Winter preparation

Planning Ahead - Plan Before Planting

- Choose plants that fit your landscape.
- Handle plants carefully at all times.
- Plant at the time of year that gives the best chance for success.
- Make the hole large enough — two to three times wider than the soil ball, the container, or the bare roots
- Always plant at the same depth at which the tree or shrub was originally growing.
- Take special precautions when planting in heavy, poorly drained, or sandy soils — soil will need to be modified
- Support tall trees with at least three wires and stakes.
- Be sure plants get adequate water for the entire first season.

North Dakota One Call
1-800-795-0555

- It’s the Law
- If digging more than 12 inches deep
- Find utility lines before you dig.
- The person doing the work is responsible for calling NDOC.
  - Individuals who dig must call
  - Professional excavators must call
- File your locate requests on line
- North Dakota One Call: 811

Tree Site Preparation

- Most roots are within the top 10–12" of the soil
- Dig planting hole same depth as root ball
- Holes deeper than rootball can result in the plant settling too deep.

Site Assessment

- Location
  - Proximity to: Trees, shrubs, structures, patios, decks.....
- Sunlight – how much or how little – should be at least 1/2 day sunlight
- Wind
- Microclimate
- Water availability
Site Assessment

Site Assessment - Soil

• Texture:
  • Sandy & well drained
    • May need to add organic matter
  • Clay
    • May need to add organic matter

Tools for Transplanting

• Shovel or spade
  • Flat edged spade
  • Spading fork
• Wheelbarrow or garden cart
• Pruners
• Labels
• Potting soil, compost, or peat moss.

Wheelbarrow
Tree Roots are Packaged Three Ways:

- **Bare Root**
- **Balled and Burlapped**
- **Container Grown**

**Balled and Burlapped (B&B)**
- Dug with a ball of soil intact around their roots.
- Root ball tightly wrapped with burlap
- Many roots are in the root ball, transplant shock reduced.
- Rough handling B&B breaks roots
- More expensive than bare-root trees
- Much heavier - generally better chance of survival

**Container Grown / Containerized**

**Bare Root**
- No soil around the roots
- Light weight
- Can be difficult to find at nurseries
- Exposed roots must be kept moist
- Deciduous trees - caliper smaller than 2 inches
- Evergreens should be very small (less than 2 feet tall).
- Plant only when dormant - spring is best

**Root Ball Sizes for Deciduous Trees**

<table>
<thead>
<tr>
<th>Plant Type</th>
<th>Height (at 1 ft)</th>
<th>Minimum Diameter Ball</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Trees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 ft</td>
<td>12 inches</td>
<td>6 inches</td>
<td>6 inches</td>
</tr>
<tr>
<td>3 ft</td>
<td>14 inches</td>
<td>8 inches</td>
<td>8 inches</td>
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<tr>
<td>4 ft</td>
<td>16 inches</td>
<td>10 inches</td>
<td>10 inches</td>
</tr>
<tr>
<td>5 ft</td>
<td>18 inches</td>
<td>12 inches</td>
<td>12 inches</td>
</tr>
<tr>
<td>Caliper (small and large)</td>
<td>Minimum Diameter Ball</td>
<td>Depth</td>
<td></td>
</tr>
<tr>
<td>6 inches</td>
<td>12 inches</td>
<td>6 inches</td>
<td></td>
</tr>
<tr>
<td>8 inches</td>
<td>14 inches</td>
<td>8 inches</td>
<td></td>
</tr>
<tr>
<td>10 inches</td>
<td>16 inches</td>
<td>10 inches</td>
<td></td>
</tr>
<tr>
<td>12 inches</td>
<td>18 inches</td>
<td>12 inches</td>
<td></td>
</tr>
<tr>
<td>Shade Trees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caliper</td>
<td>Minimum Diameter Ball</td>
<td>Depth</td>
<td></td>
</tr>
<tr>
<td>½ inch</td>
<td>14 inches</td>
<td>6 inches</td>
<td></td>
</tr>
<tr>
<td>¾ inch</td>
<td>16 inches</td>
<td>8 inches</td>
<td></td>
</tr>
<tr>
<td>1 inch</td>
<td>18 inches</td>
<td>10 inches</td>
<td></td>
</tr>
<tr>
<td>1½ inch</td>
<td>20 inches</td>
<td>12 inches</td>
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</tr>
<tr>
<td>1¾ inch</td>
<td>22 inches</td>
<td>14 inches</td>
<td></td>
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<tr>
<td>2 inches</td>
<td>24 inches</td>
<td>16 inches</td>
<td></td>
</tr>
</tbody>
</table>

American Standard for Nursery Stock
### Root Ball Sizes for Deciduous Shrubs

<table>
<thead>
<tr>
<th>Height</th>
<th>Minimum Diameter Ball</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 inches</td>
<td>6 inches</td>
<td>7 inches</td>
</tr>
<tr>
<td>18 inches</td>
<td>8 inches</td>
<td>8 inches</td>
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<tr>
<td>3 feet</td>
<td>9 inches</td>
<td>9 inches</td>
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<tr>
<td>3 feet</td>
<td>10 inches</td>
<td>10 inches</td>
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<tr>
<td>4 feet</td>
<td>11 inches</td>
<td>11 inches</td>
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<tr>
<td>5 feet</td>
<td>12 inches</td>
<td>12 inches</td>
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<tr>
<td>6 feet</td>
<td>13 inches</td>
<td>13 inches</td>
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<tr>
<td>7 feet</td>
<td>14 inches</td>
<td>14 inches</td>
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</tbody>
</table>

### Root Ball Sizes for Evergreens - Spreading, Semi-Spreading & Globe

<table>
<thead>
<tr>
<th>Spread</th>
<th>Minimum Diameter Ball</th>
<th>Depth</th>
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</thead>
<tbody>
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<td>9 inches</td>
<td>6 inches</td>
<td>8 inches</td>
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<tr>
<td>12 inches</td>
<td>8 inches</td>
<td>9 inches</td>
</tr>
<tr>
<td>18 inches</td>
<td>10 inches</td>
<td>11 inches</td>
</tr>
<tr>
<td>2 feet</td>
<td>12 inches</td>
<td>12 inches</td>
</tr>
<tr>
<td>2½ feet</td>
<td>14 inches</td>
<td>14 inches</td>
</tr>
<tr>
<td>3 feet</td>
<td>16 inches</td>
<td>16 inches</td>
</tr>
<tr>
<td>3½ feet</td>
<td>18 inches</td>
<td>18 inches</td>
</tr>
<tr>
<td>4 feet</td>
<td>20 inches</td>
<td>20 inches</td>
</tr>
</tbody>
</table>

### Root Ball Sizes for Evergreens – Columnar

<table>
<thead>
<tr>
<th>Spread</th>
<th>Minimum Diameter Ball</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 inches</td>
<td>8 inches</td>
<td>8 inches</td>
</tr>
<tr>
<td>2 feet</td>
<td>10 inches</td>
<td>10 inches</td>
</tr>
<tr>
<td>3 feet</td>
<td>12 inches</td>
<td>12 inches</td>
</tr>
<tr>
<td>4 feet</td>
<td>14 inches</td>
<td>14 inches</td>
</tr>
<tr>
<td>5 feet</td>
<td>16 inches</td>
<td>16 inches</td>
</tr>
</tbody>
</table>

### Prepare the Planting Hole
- As you dig the planting hole, pile the soil on a tarp or plastic sheet. This makes cleanup much easier for backfilling the new plant.
- Dig the hole twice the size of the root ball.
- Dig hole as deep as the root system will be - don’t go any deeper.
- If the hole gets too deep, add soil back in and firm it with your feet. This keeps the plant from settling.
- If working with a bare root tree or shrub, you can shape the hole to fit the roots.
- You will be using most or much of the soil removed from the hole for backfill later.

### Root Pruning Before Digging
- If possible, root prune a couple of seasons before digging.
- Root prune in the spring if transplanting in the fall.
- Root prune in the fall if transplanting in the spring.
- Tie up branches to get easier access to digging area.
- Dig a trench around the plant about the size of the expected ball that you will be digging.
- Dig through and cut off a majority of the roots.
- Add the subsoil back in and then the top soil.
- Water the soil back in and plan to water on a regular basis through the season.

### Machine Digging the Plant
Digging the Plant

- Tie up the branches of shrubs – makes digging easier.
- Mark the soil line on trees and shrubs.
- Mark the north side of the tree or shrub.
- Shrubs under three feet – consider digging bare root – must be dormant.
- Trees under one inch in caliper (measure 6 inches above ground) can be dug bare root – must be dormant.
- All evergreen trees and shrubs should be dug with soil attached to roots.

Digging for Bare Root Transplanting

- Dig bare root only when the tree or shrub is dormant.
- Dig a trench around the plant farther out than the planned size of the bare root system.
- As you dig and cut the roots, gently move the plant from side to side to loosen it from the soil. – try not to break any roots.
- Continue to dig and cut the lateral roots until they are completely free.
- Cut remaining taproots before attempting to remove the tree / shrub from the ground.

Digging the Plant for B&B Transplanting

- Dig a trench around the plant farther out than the planned size of the soil ball.
- Kneel down, hold shovel facing yourself, chop down through soil and roots, pull the soil away from the plant.
- Try to leave a completely undisturbed ball of roots and soil.
- Work around the plant “chopping down” and pulling the soil back from the plant.
- Cut off large roots with a pruner or lopper.

Digging for Bare Root Transplanting

- Upon removing the plant from the ground, shake it to get off the loose soil.
- Some soil clinging to the roots is ok – helps keep them moist.
- Sprinkle roots with water as soon as possible.
- Roots must be kept moist and covered in burlap, tarp, plastic, or wrapped with wet peat moss or straw / hay until ready to re-plant.

Bare Root Trees

- No soil around the roots
- Light weight
- Can be difficult to find at nurseries
- Exposed roots must be kept moist
- Deciduous trees - caliper should be smaller than 2 inches
- Evergreens should be very small (less than 2 feet tall).
- Plant only when dormant - spring is best

Digging the Plant

- When the soil ball is dug to the correct depth, undercut remaining roots with a flat spade.
- When soil ball is loose, wrap entire ball with non-treated burlap.
- Carefully tip ball to one side and slide burlap under, then tip back to the other side - It’s like diapering a baby.
- Use twine wrapped tightly to hold the material in place – nails can also be used to pin the material to the ball.
- With plenty of help (this soil ball will be heavy) carefully remove the soil ball from the hole.
- A 15 “ by 15 “ ball could weigh 200 pounds.
**Transporting Plants to New Location**

- If traveling more than a few miles
- Be sure plant is watered.
- Wrap branches with burlap, tarp, or cloth to protect from wind damage.
- If plant is laid on side, be sure soil will not spill out of container.
- Upon arriving at destination
  - Remove branch wrapping very soon - prevents overheating of foliage.
  - Water plant if it will not be immediately planted.

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**Planting**

- Plant trees and shrubs at the same depth as they were growing before.
- If planting from container – plant at the same depth - unless it’s obvious the plant was either too deep or too shallow in the container.
- If necessary, locate the “trunk flare” and plant at that depth
  - Be sure to loosen and spread out roots of plants grown in containers.
- Add anchor stakes before backfilling completely – this helps to tell where the roots are and will keep the

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**Planted Too Deep**

- Dig hole about 50 percent wider than root ball
- Remove or cut away all visible rope, burlap, twine, nails
- Take off the wire basket - use bolt cutters
- Hole should be same depth as root ball.
- Center the plant in the hole
B&B - SETTING THE PLANT

- Set trunk flare 1 – 2” above grade
- Add subsoil and gently firm it around the ball
- Water the subsoil to settle it
- Next add the topsoil - tamp lightly and then water.

Planting Bare Root

- Hole should be about 50 percent wider than root system
- Make sure hole will be no deeper than original depth that plant was growing at.
- Leave center of hole slightly higher (slight mound) than outside edges of hole – prevents settling of the plant.

Planting Bare Root Trees

1: Soak Roots 3 – 6 hours
2: Don’t plant packing materials
Dig Hole Wider than the roots

Inspect roots
Using a sharp pruner, make a clean cut on any roots that have been damaged or are too long to fit in the hole without circling.

- Place plant in hole and spread out roots. Keep from circling, or twisting.
- To allow for settling, plant should be about 1 inch higher than original depth.

Planting Bare Root

- Add subsoil to the hole, gently wiggle the plant to help settle the soil around the roots
- Water lightly to help settle subsoil
- Add the top soil – work it in around the roots with your hands
- Tamp the top soil lightly
- Water – let it soak away and then water again.
Planting Bare Root Trees

3: Plant at original depth
   - Spread out roots
   - Prune damaged roots

4: Add 1/2 the soil — make sure it’s firm but not compacted
   - Add remaining soil and plenty of water

5: Place 2” of mulch on top of the soil
   - Keep mulch back from trunk

6: Water thoroughly every 7 – 10 days
   - Support large trees

Plan Before Planting

- Choose plants that fit your landscape.
- Handle plants carefully at all times.
- Plant at the time of year that gives the best chance for success.
- Make the hole large enough — two to three times wider than the soil ball, the container, or the bare roots
- Always plant at the same depth at which the tree or shrub was originally growing.
- Take precautions when planting in heavy, poorly drained, or sandy soils — soil will need to be modified
- Support tall trees with at least three wires and stakes.
- Be sure plants get adequate water for the entire first season.

Job Well Done!