

Propagating Your Own Hazelnuts

Lois Braun

UNIVERSITY OF MINNESOTA

Driven to DiscoverSM



Methods of Propagation You Can Do at Home

1. Planting your own seed
2. Mound layering



Growing from Seed

- How to harvest seeds
- How to stratify and germinate seeds
- Potting medium
- Pot sizes
- Transplanting
- Simplest system: do it the way nature does it

**Harvest seeds
when they are mature,
that is, when the nuts
turn in the husks!**

“Stratification”

The process of subjecting seeds to cold and moist conditions necessary for overcoming seed dormancy.

- Usually 1 to 5 °C (34 to 41°F)
- The duration required depends on the species and its provenance.
- The clock stops when temperatures are below freezing.
- A warm period following stratification is needed for dormancy to be broken.

**What happens to a wild hazelnut
seed after it is mature?
(Assuming it isn't harvested and eaten.)**

What happens to a wild hazelnut seed after it is mature?

(Assuming it isn't harvested and eaten.)

- It falls to the ground.
- It is subjected to moist cool conditions until spring.
- It germinates when temperatures are ideal in the spring.

Three Approaches to Stratification and Germination

1. The way nature does it—outdoors, with the seasons.
2. Moist stratification in a refrigerator and germination in a greenhouse.
3. Accelerated method with Gibberellic acid.

Stratification in a refrigerator

- Seeds never dried down:
 - Pack them in plastic bags with something to keep them slightly moist in a 33⁰F refrigerator for 3 to 4 months.
- Seeds have dried down:
 - Rehydrate them by soaking in water, with daily changes of water, for 3 days before stratification as above.

Accelerated Method with Gibberellic Acid

1. Immediately after harvest (August) shell the kernels out carefully.
2. Soak them in 50 ppm GA₃ for about 12 hours.
3. Immediately germinate them in a peat-based potting medium.
4. In about 3 to 4 weeks (September) transplant seedlings to pots.

Potting Medium

I use a well-drained bark-based commercial potting mix:

- Metro Mix 852 (SunGro Horticulture), which is 50-60% composted pine bark “for superior drainage”.
- Add perlite to MNM 852 in a ratio of 1:4
- Add 5 to 6 month slow release fertilizer (Osmocote 15N-9P-12K Plus micronutrients) at a rate of 1.5 lbs per 2.8 cubic foot bag of MM 852 (equivalent to 1 Tbs per gallon pot).

Do NOT use field soil!

It does not provide adequate drainage!

Pot Size Experiment



Pot Size Experiment



Pot Size Experiment

Planted May 29

Photographed July 18



Results—Seedling size

- Seedlings grown in the greenhouse were taller than ones grown outdoors.
- Seedlings grown outdoors had thicker stems and broader canopies than ones grown indoors.
- Seedling size, both height and stem caliper, increased significantly with pot size ($p < 0.0001$)
- Root quality (evaluated subjectively) also improved with pot size, even when many seedlings were in the same large pot together.
- Root quality was highest for plants growing by themselves in a 2 gallon pot.

1 ½ by 6 inch pots



Two Gallon Pots



Bare-Root Seedling from a Two Gallon Pot

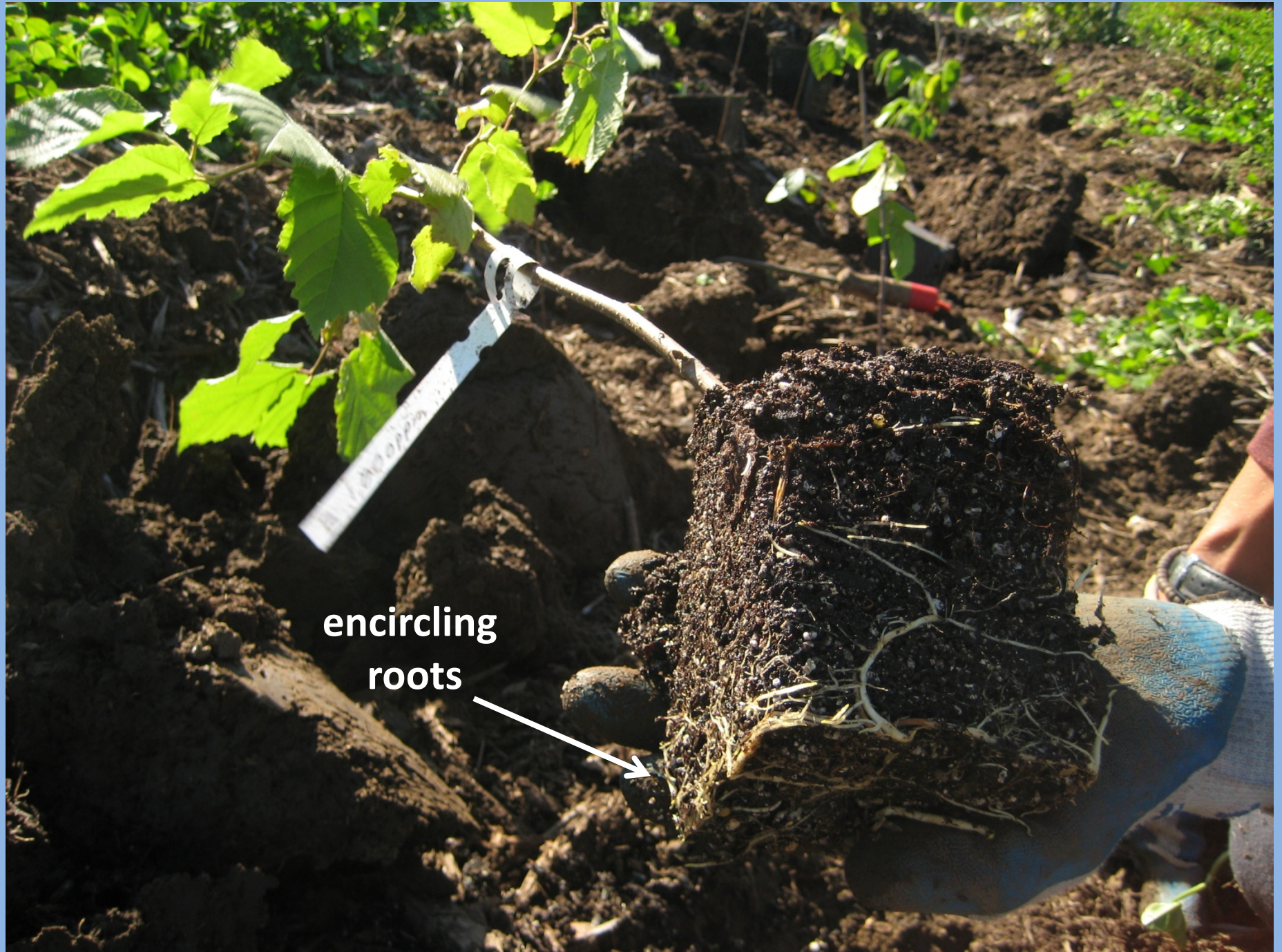


Results—Transplant Survival

- Transplant survival was significantly higher for seedlings grown in 2 gallon pots than for seedlings from tubes ($p = 0.0005$)
 - even though their roots were disturbed during transplanting.
- Transplant survival was highly correlated with seedling size at transplanting ($p < 0.0001$).
 - Seedling size predicted transplant success better than pot size.

Transplant Timing for Containerized Seedlings

- Can be transplanted any time, but best when not too hot. (the middle of the summer is not advised)
- Do not allow plants to become root bound or to deplete the nutrients in their pots:
 - If they get too big for their pots, transplant them either into the field or into bigger pots!
- If they become root bound, gently work the roots out of the root ball.



encircling
roots





Growing Seedlings Nature's Way (almost)



**Norm and Mary
Erickson's Farm**

Growing Seedlings Nature's Way

- Plant seeds in the fall to stratify in the soil over the winter and germinate in the spring.
- Let them grow through the entire growing season.
- Dig them when dormant the following fall or spring and bare-root transplant them immediately.

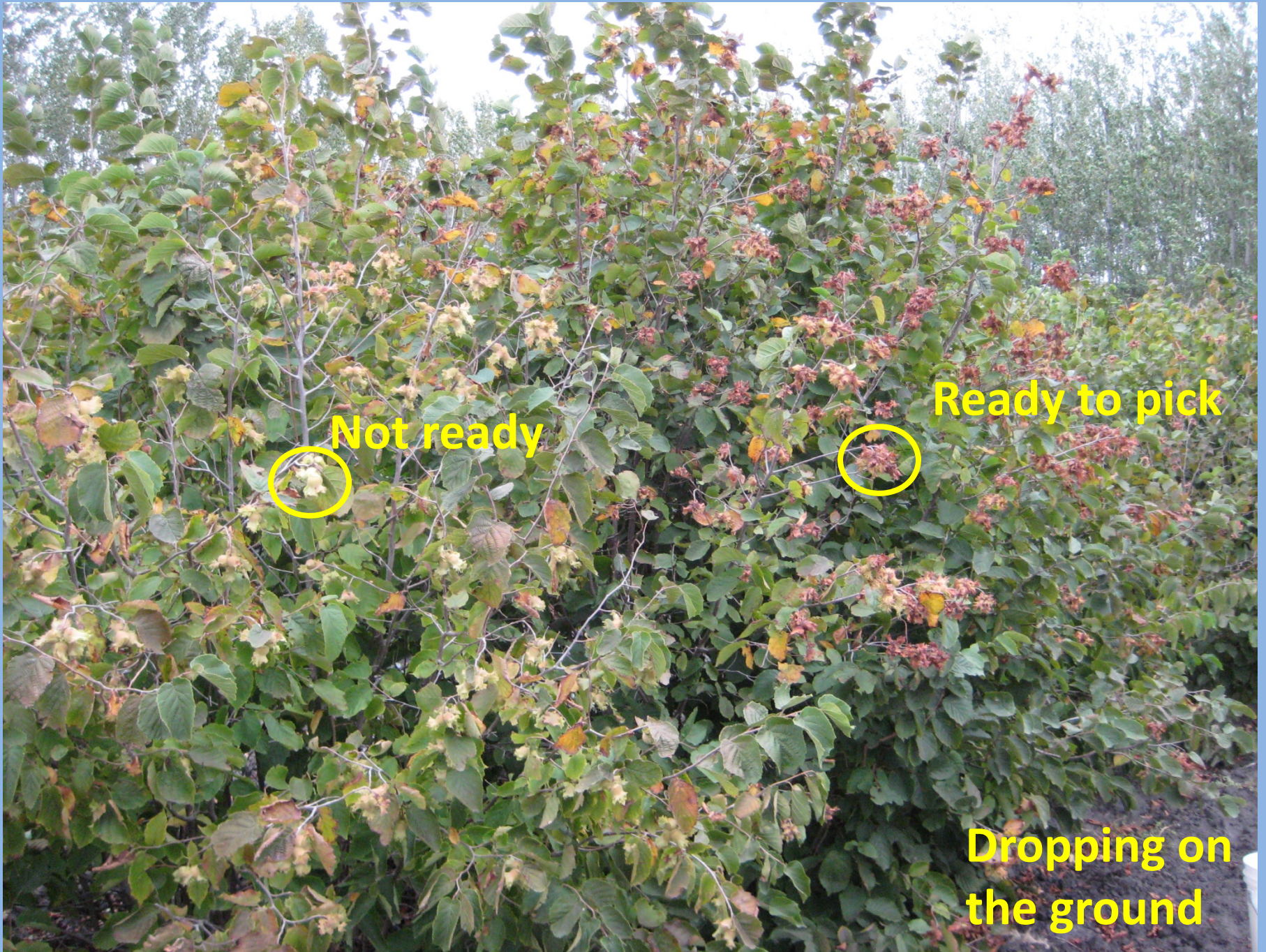
Growing Seedlings Nature's Way

- 1 ½ foot tall box to keep nut predators out. Initially it was covered with hardware cloth.
- Use a light growing medium from which seedlings can easily be dug.
 - Could be a potting soil (with added fertility)
 - Could be field soil amended with peat or compost
 - Ericksons use a mix of peat and vermiculite plus a slow release complete fertilizer.
- At least 6 inches depth of growing medium.
- Plant seeds about 1 inch deep on a 1 ½ inch grid.

**What's the drawback of
planting your own seed?**



27. 5. 2004



Not ready

Ready to pick

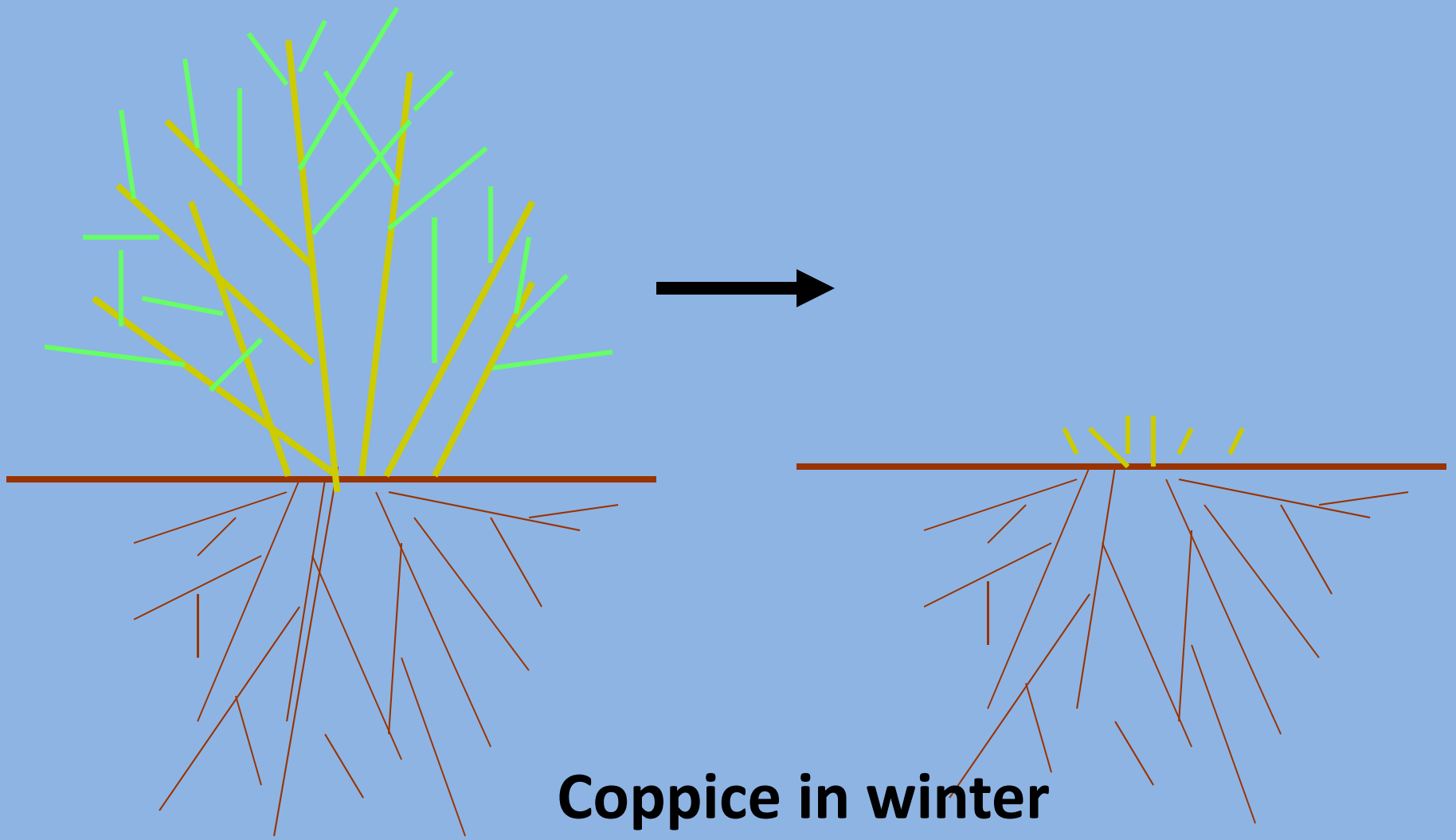
**Dropping on
the ground**

Methods of Propagation

You can do at home

1. Planting your own seed
- 2. Mound layering**

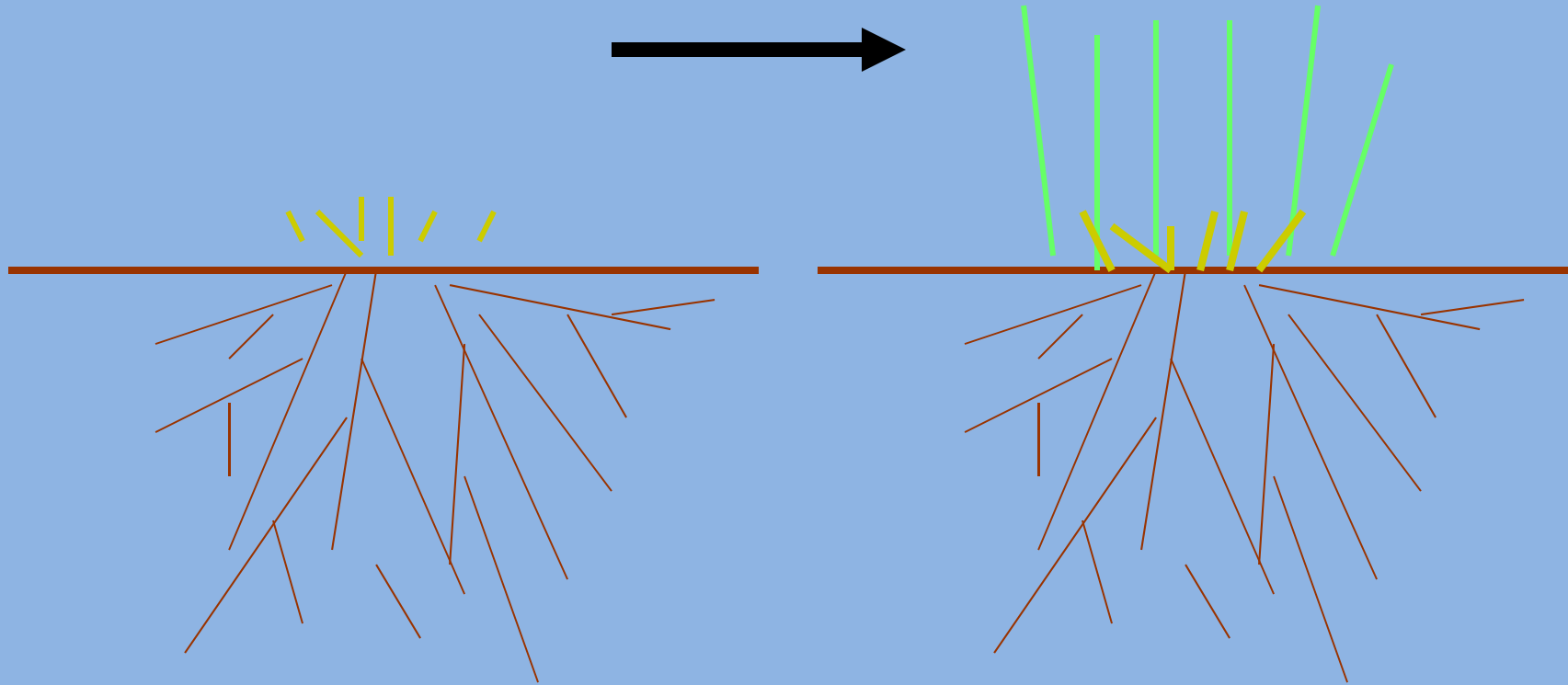
Mound Layering



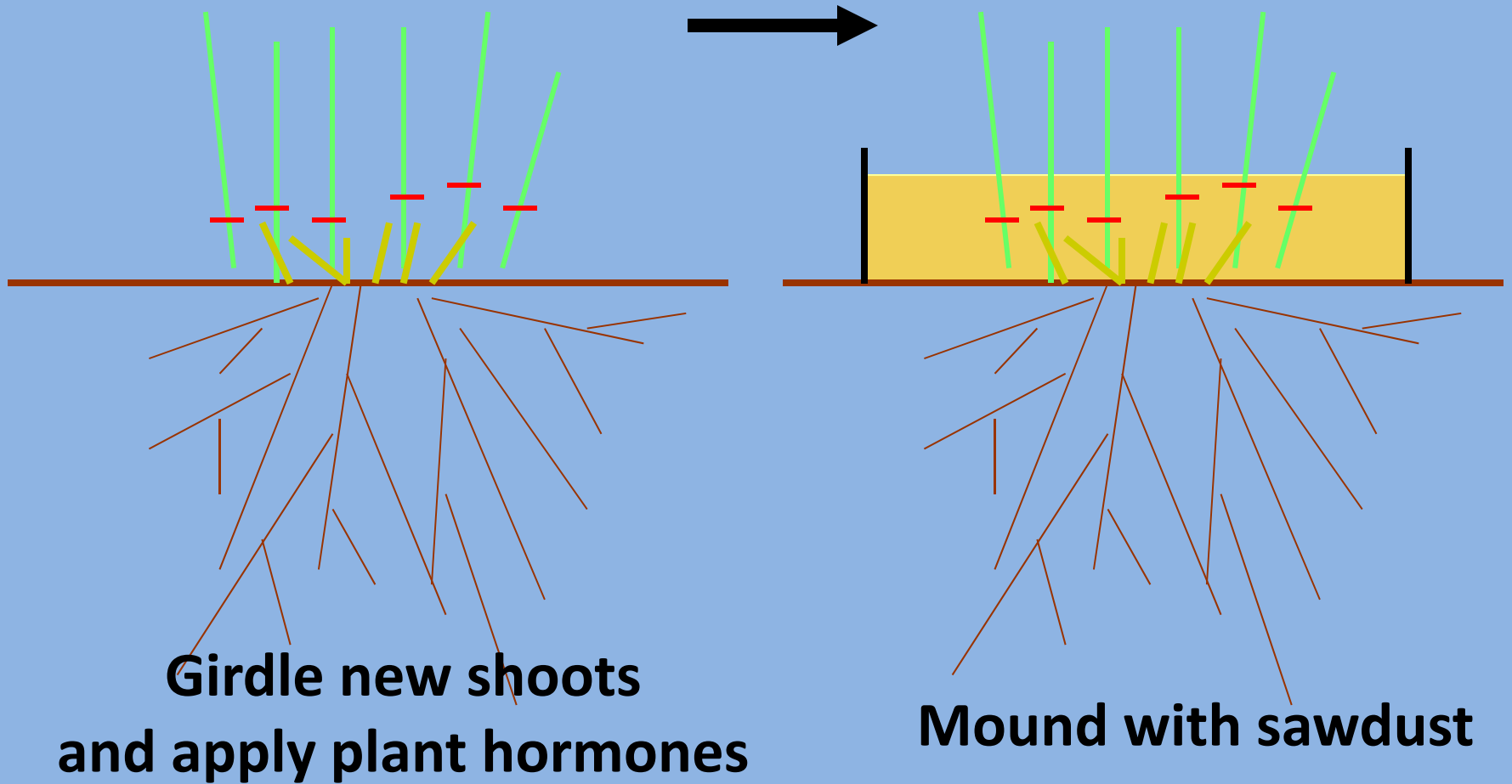
Coppice in winter

Mound Layering

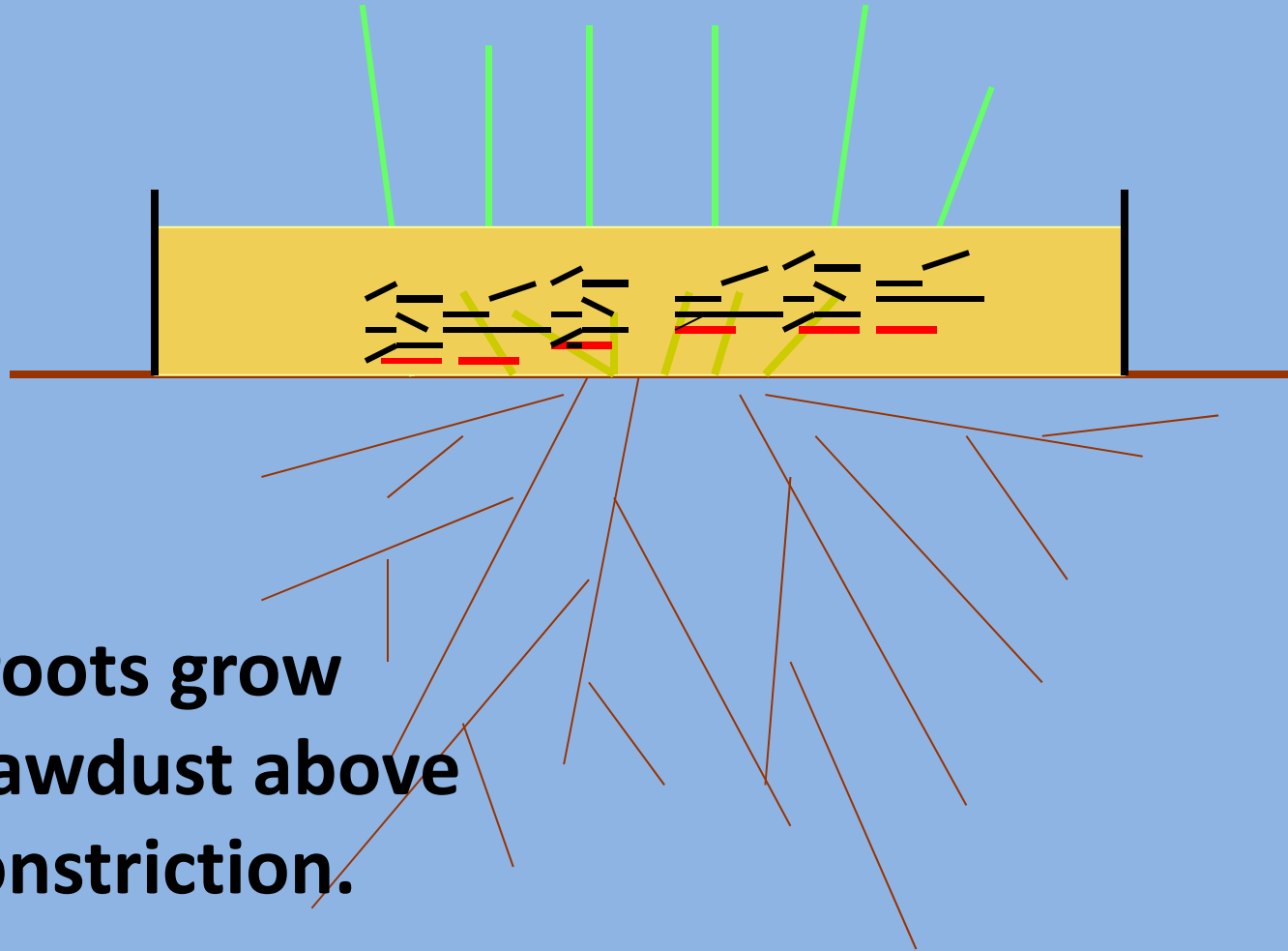
New spring shoots



Mound Layering

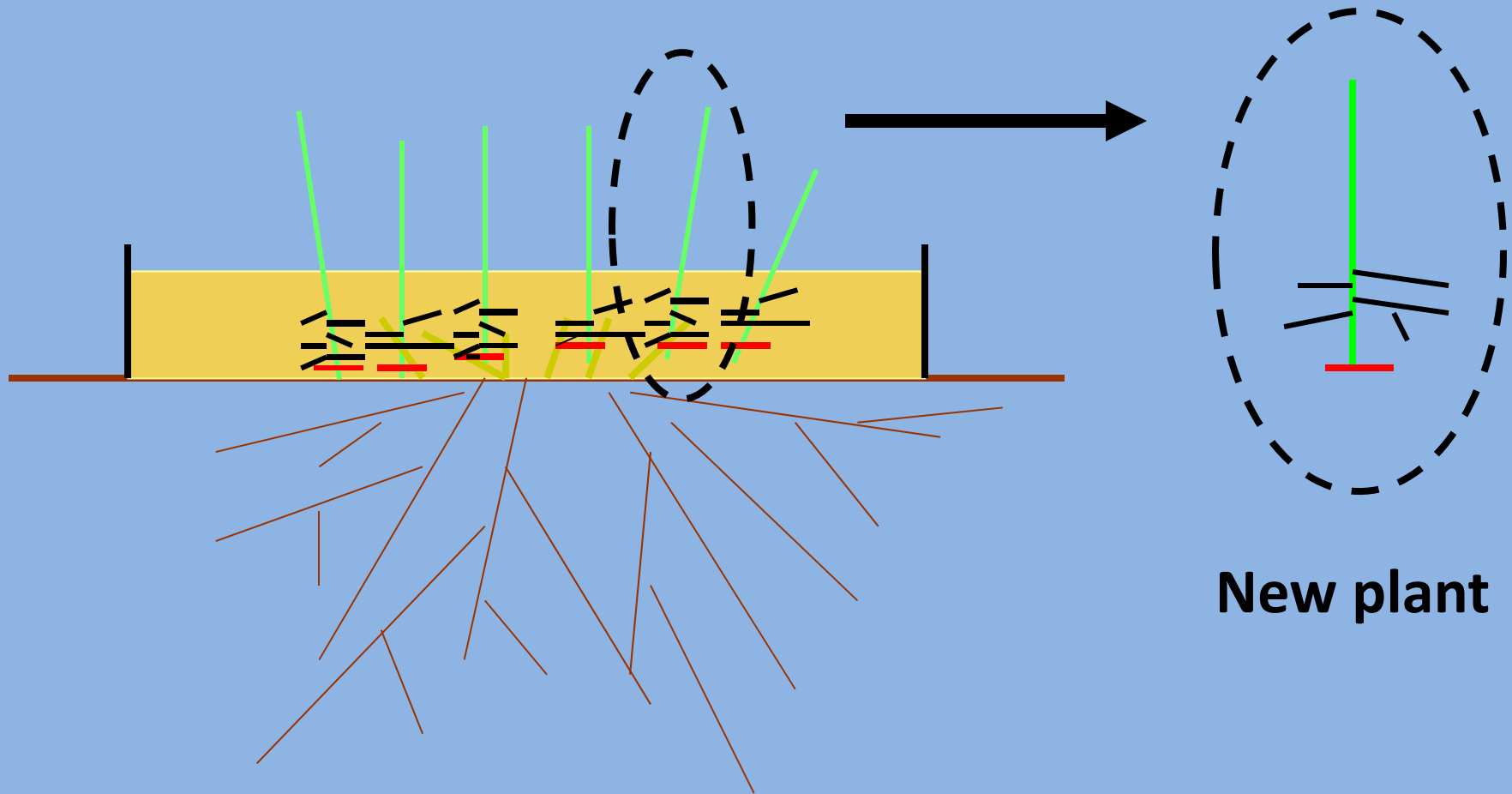


Mound Layering



**New roots grow
into sawdust above
the constriction.**

Mound Layering

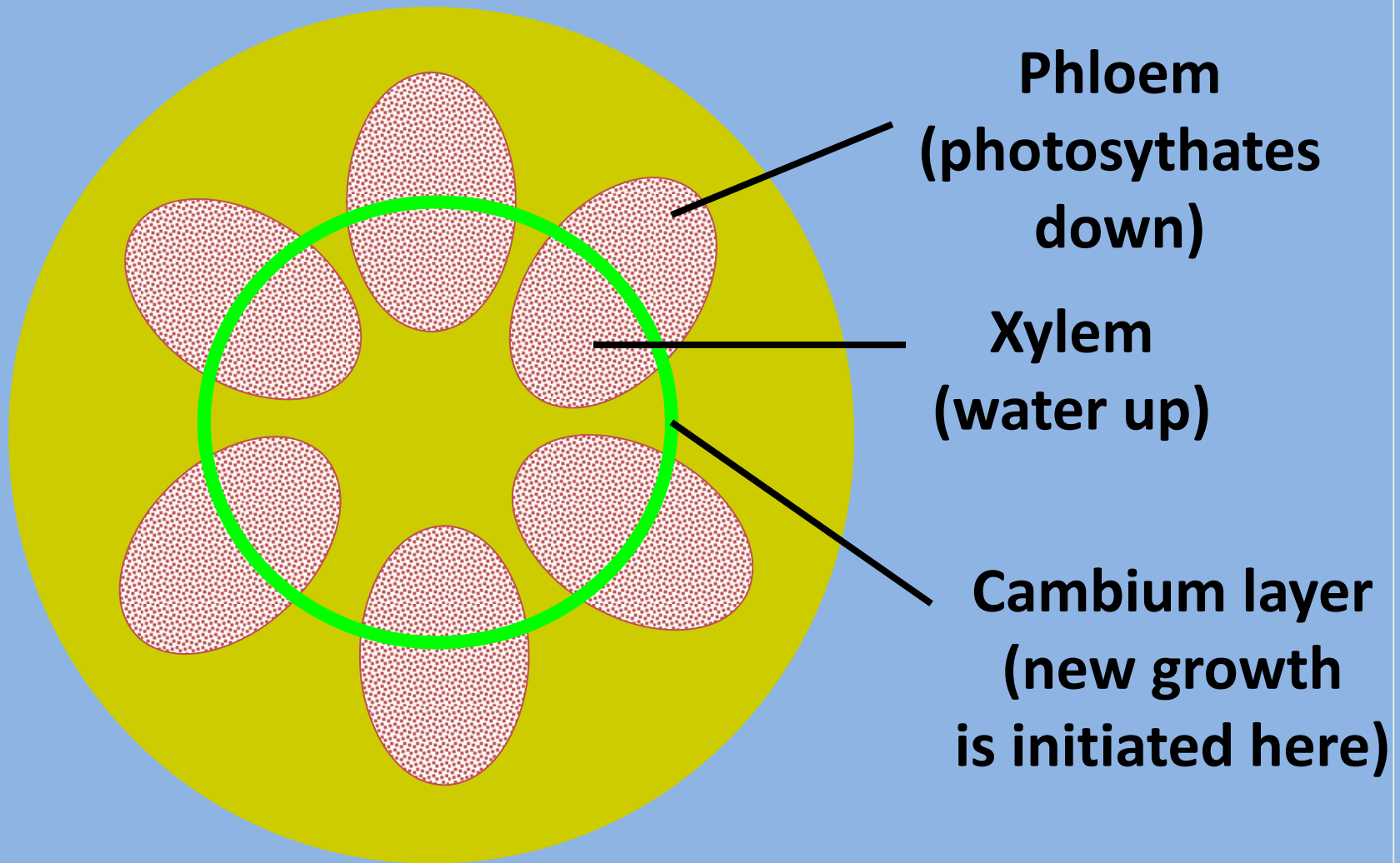


New plant



Tying on the twist-ties

Cross-Section of a Stem





**Painting on the
rooting hormone**

Rooting Compound

2,000 grams per liter IBA in 50% ethanol

=

2,000 ppm IBA

Commercially available products:

Hormex

Root-tone

Dip N Grow

Formulations intended to be applied as a dry powder can be mixed with a little water and applied as a paste.



**Use sawdust or
any light friable
material that
will hold
moisture.**









When to Prepare Stems?

What Size of Stem to Prepare?

Spacing of Stems, etc

- **Late June is usually a good time to layer.**
- **Layer stems that are about a pencil thickness in diameter.**
 - **Stems that are too young break too easily**
 - **Stems that are too old have lost their totipotency**
- **Thin stems as needed so you have space to work.**
- **Twist-ties need not be very tight.**
-



When to Harvest Rooted Layers? When to Transplant Them?

- **Harvest when they are dormant.**
- **Fall or spring are equally good.**
- **Keep the roots moist after harvesting**
- **Transplant ASAP or heel them in for the winter.**

For the Best Results with Layering Use Plants that are Healthy!

- ❖ Adequate fertility**
- ❖ Adequate soil moisture**
- ❖ Large well developed root systems
(do not layer very young plants)**
- ❖ Abundant sunlight**



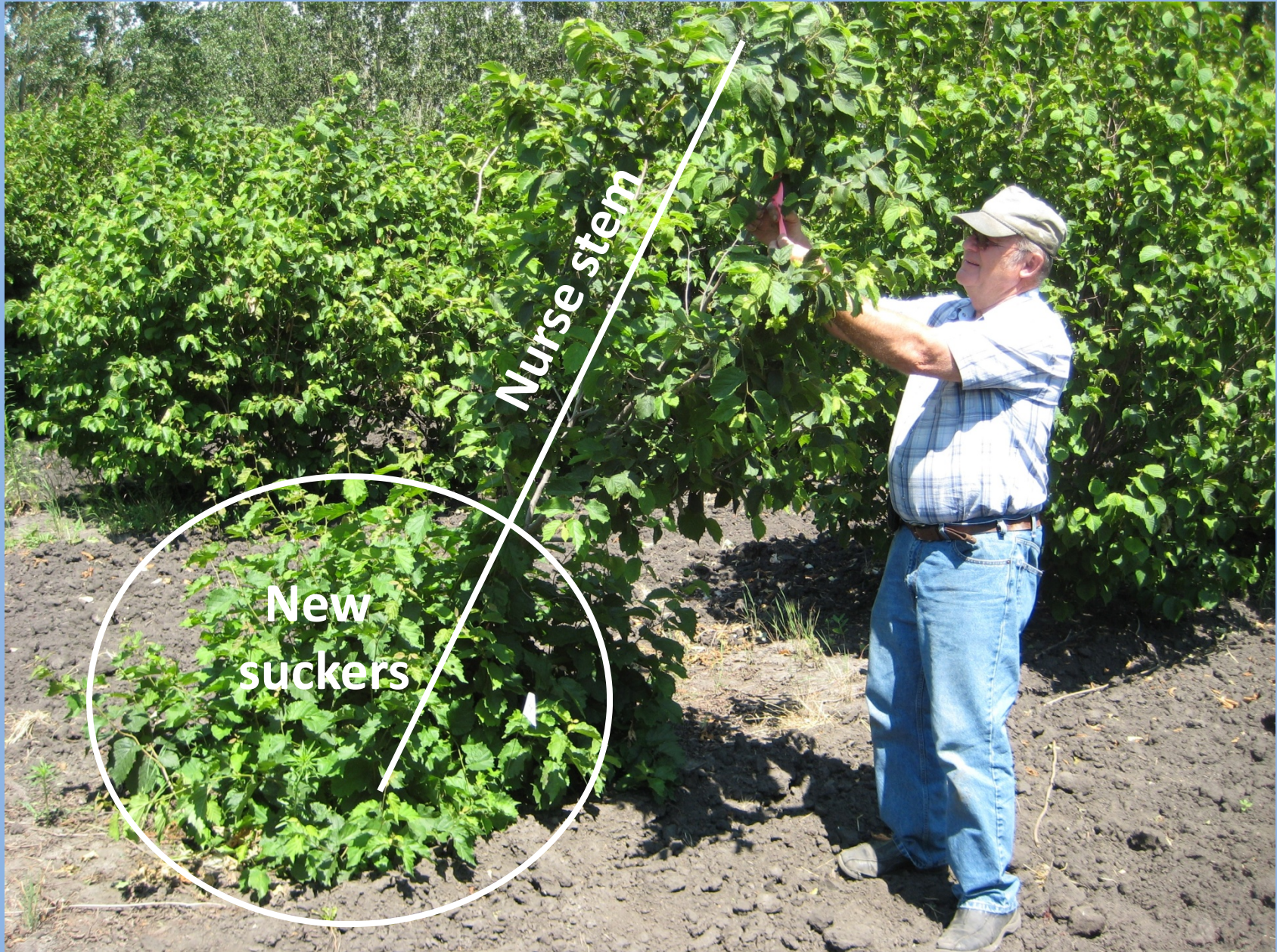
The largest layers do not necessarily have the best survival because they may have a low root-to-shoot ratio.



If the tops are too large, cut the stems back to above one or two healthy buds after transplanting.



To Nurse or Not?



Mound Layering compared with other methods of vegetative propagation

Advantages

- Low-tech
- Capable of producing large robust new clones.
- Relatively high rates of rooting (50 to 100%).
- High survival of transplants (up to 98%).

Disadvantages

- Setting it up requires working at ground level.
- Harvesting rooted layers may result in back strain.
- Must be transplanted while dormant.
- Only one new plant produced per stem.



Why Suckers Don't Transplant Well



Same plant, viewed from the top

Acknowledgements



United States Department of Agriculture
National Institute of Food and Agriculture



INSTITUTE ON THE ENVIRONMENT

UNIVERSITY OF MINNESOTA

Driven to DiscoverSM



Sustainable Agriculture
Research & Education