Seedling Nursery Culture of Whitebark Pine at Dorena Genetic Resource Center

Headaches, Successes, and Growing Pains

Ashland OR

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Tree Identification Lesson #1

Photo courtesy of Bob Danchok, Dorena GRC, Umpqua NF, USDA Forest Service

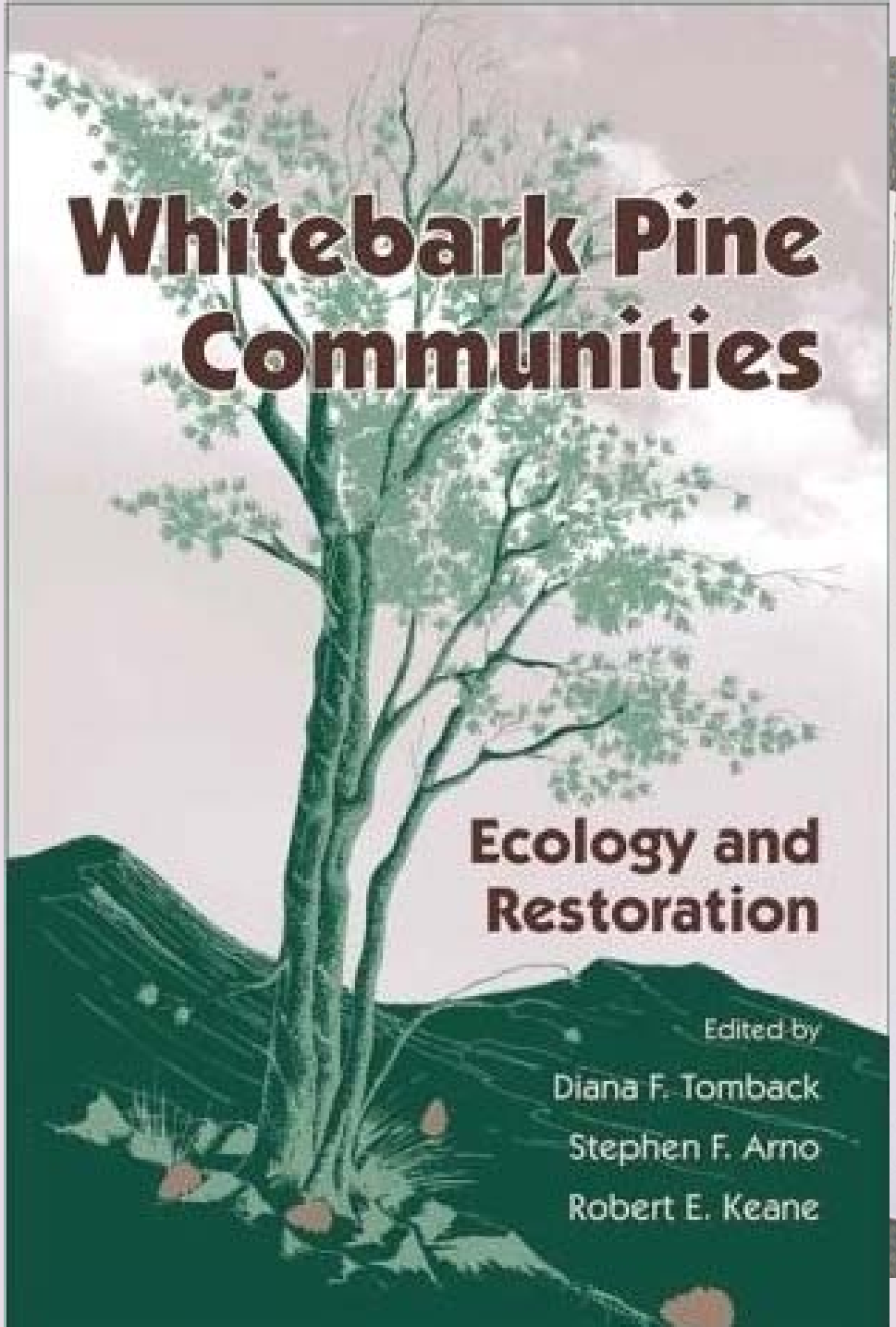
The Whitebark Pine Seedling

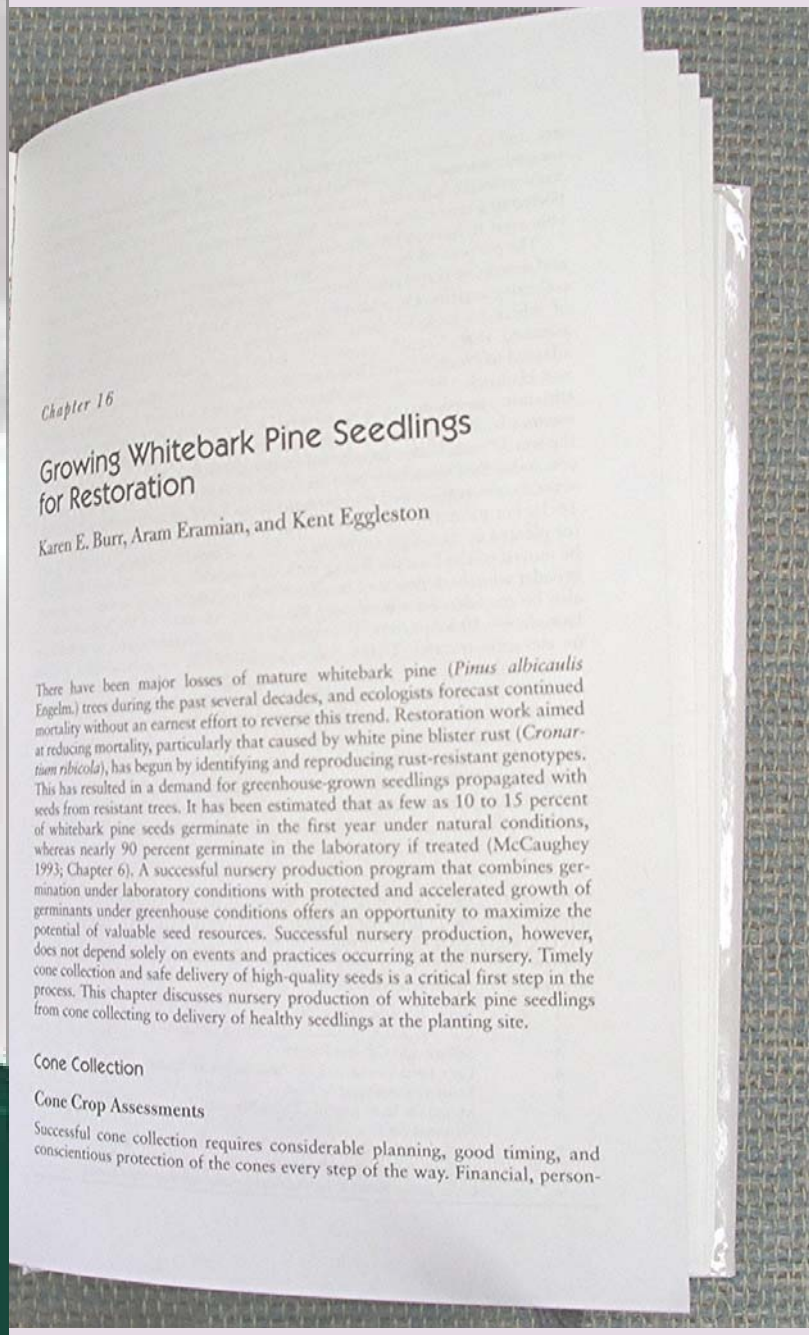
Direct Sowing into Frames with Western White Pine

Direct Sowing of Whitebark Pine into Cells

And Then,--

When Germination Did Occur…….





Chapter 16

Growing Whitebark Pine Seedlings for Restoration

Karen E. Burr, Aram Eramian, and Kent Eggleston

There have been major losses of mature whitebark pine (*Pinus albicaulis* Engelm.) trees during the past several decades, and ecologists forecast continued mortality without an earnest effort to reverse this trend. Restoration work aimed at reducing mortality, particularly that caused by white pine blister rust (*Cronartium ribicola*), has begun by identifying and reproducing rust-resistant genotypes. This has resulted in a demand for greenhouse-grown seedlings propagated with seeds from resistant trees. It has been estimated that as few as 10 to 15 percent of whitebark pine seeds germinate in the first year under natural conditions, whereas nearly 90 percent germinate in the laboratory if treated (McCaughey 1993; Chapter 6). A successful nursery production program that combines germination under laboratory conditions with protected and accelerated growth of germinants under greenhouse conditions offers an opportunity to maximize the potential of valuable seed resources. Successful nursery production, however, does not depend solely on events and practices occurring at the nursery. Timely cone collection and safe delivery of high-quality seeds is a critical first step in the process. This chapter discusses nursery production of whitebark pine seedlings from cone collecting to delivery of healthy seedlings at the planting site.

Cone Collection

Cone Crop Assessments

Successful cone collection requires considerable planning, good timing, and conscientious protection of the cones every step of the way. Financial, person-

2002 Whitebark Pine Cultural Regimes Study

Materials

20 seedlots; various years; various locations

Treatments

Seed Pretreatment: 48 h running tap water (CDA)
24 h 1% H^2O^2; 24 h H^2O (DGRC)

Stratification: 28 d warm (10 °C); 30 d cold (1 to 2 °C)
28 d warm; 60 d cold (CDA)
28 d warm; 90 d cold

Germination: 16 °C night/ 18 °C day
20 °C night/ 22 °C day (CDA)

Culturing: Climate controlled greenhouse
30% shadecloth over greenhouse

2002 Whitebark Pine Cultural Regimes Study

Conclusions

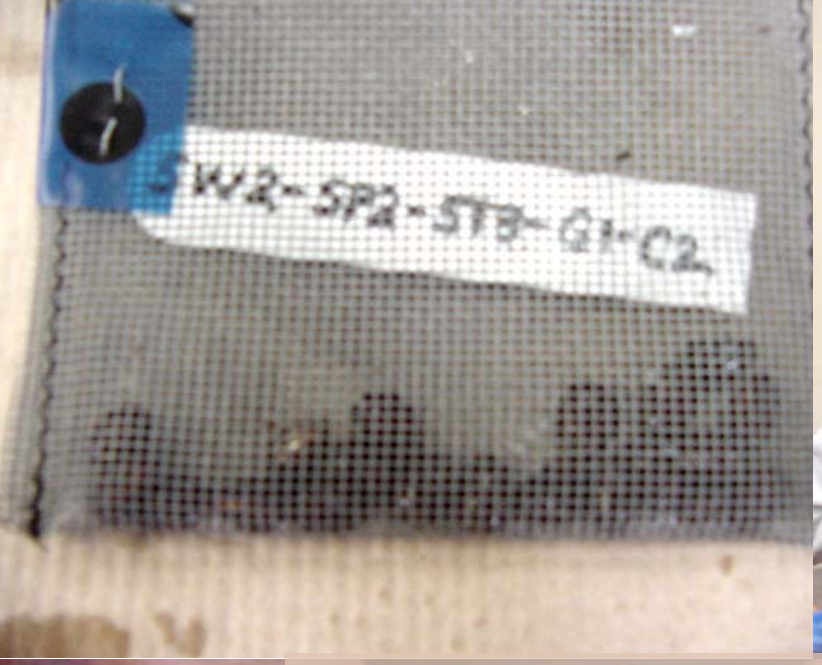
Seed Pretreatment: No difference.

Continue to use 24 h 1% H^2O^2; 24 h H^2O.

Stratification: 28 d warm, 90 d cold

Germination: 18 °C night/ 20 °C day

Culturing: To be continued….



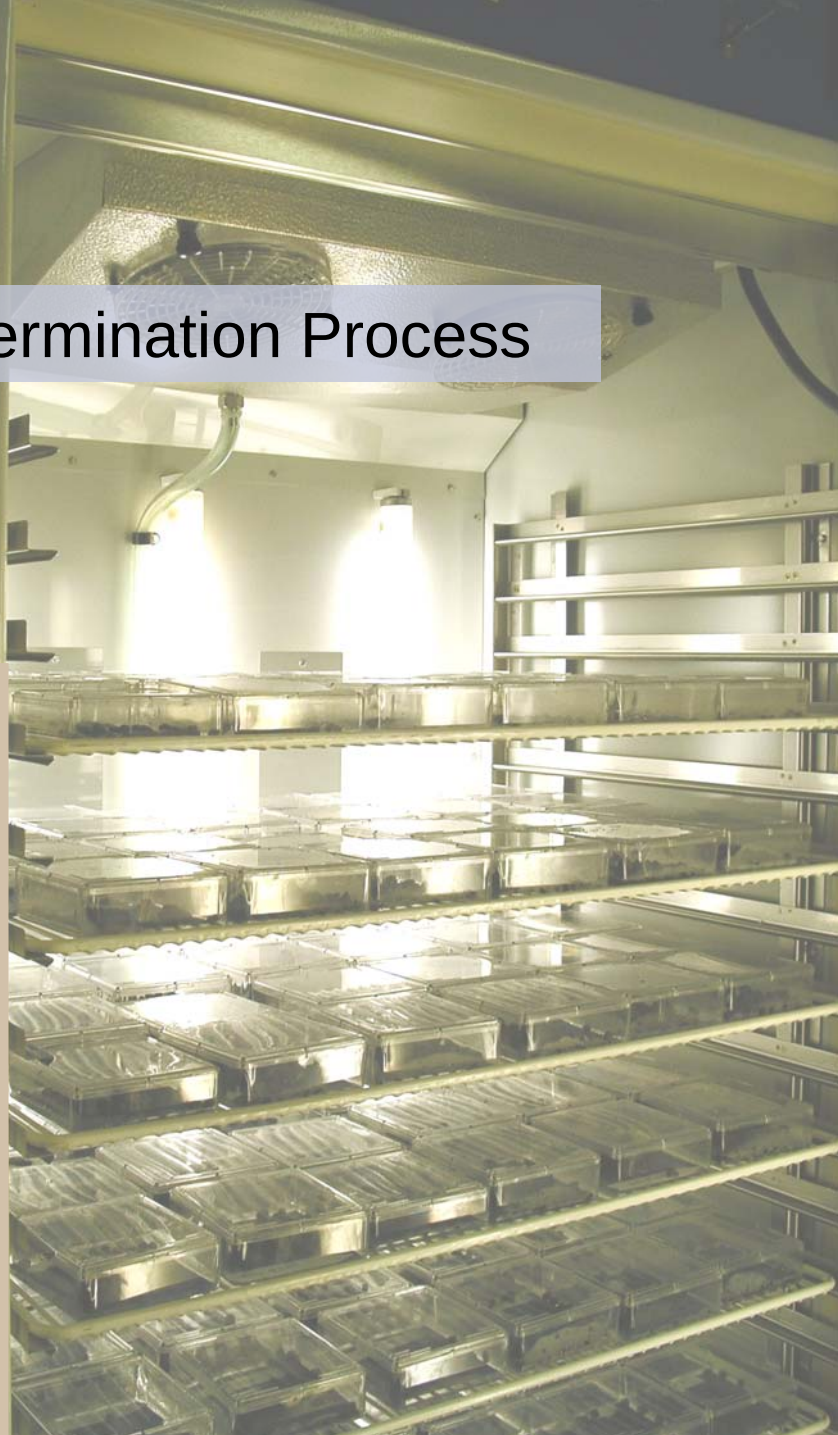
Stratification and Scarification Options

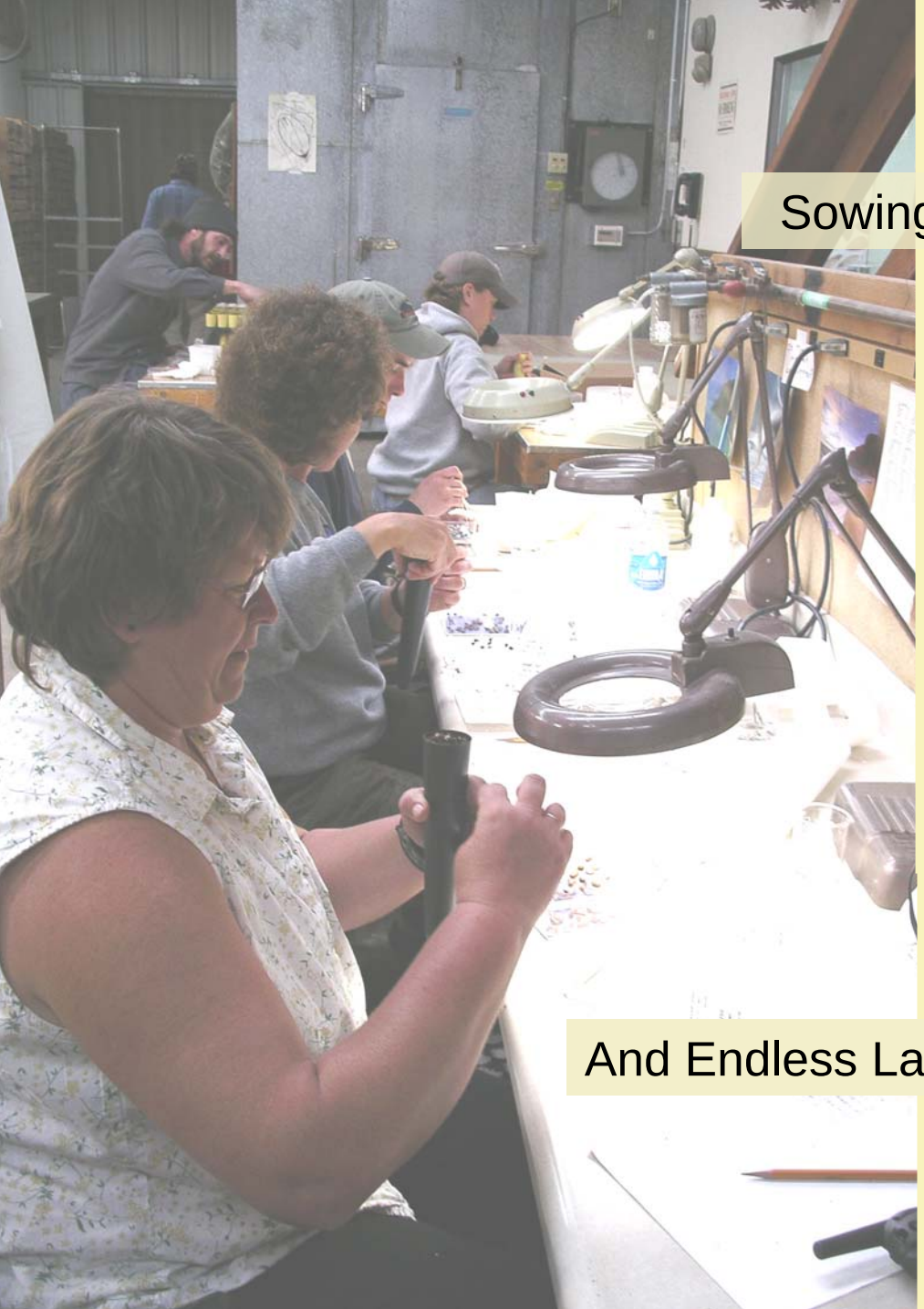
A Production Alternative to Hand-Nicking Seeds

Missoula Technology & Development Center

USDA Forest Service

The Germination Process





Sowing, Sowing, and More Sowing…

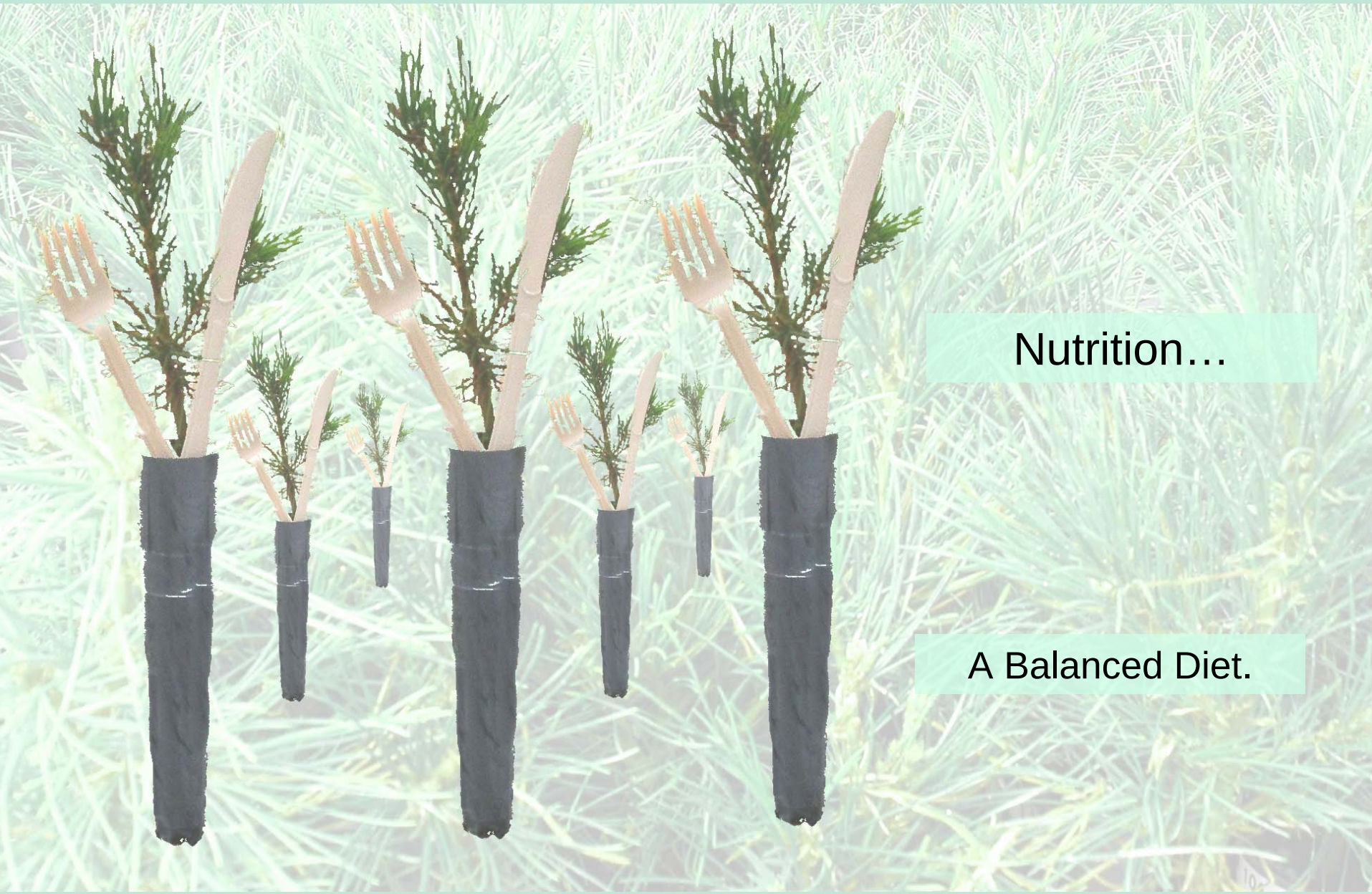
And Endless Labeling.

Seedling Protection Efforts

Success, One Month Later.

Here Comes The Sun…

Photoperiod



Nutrition…

A Balanced Diet.

The Full Complement of Timed-Release and Soluble Fertilizers for Years 1 and 2

Seedlings at 3 Months

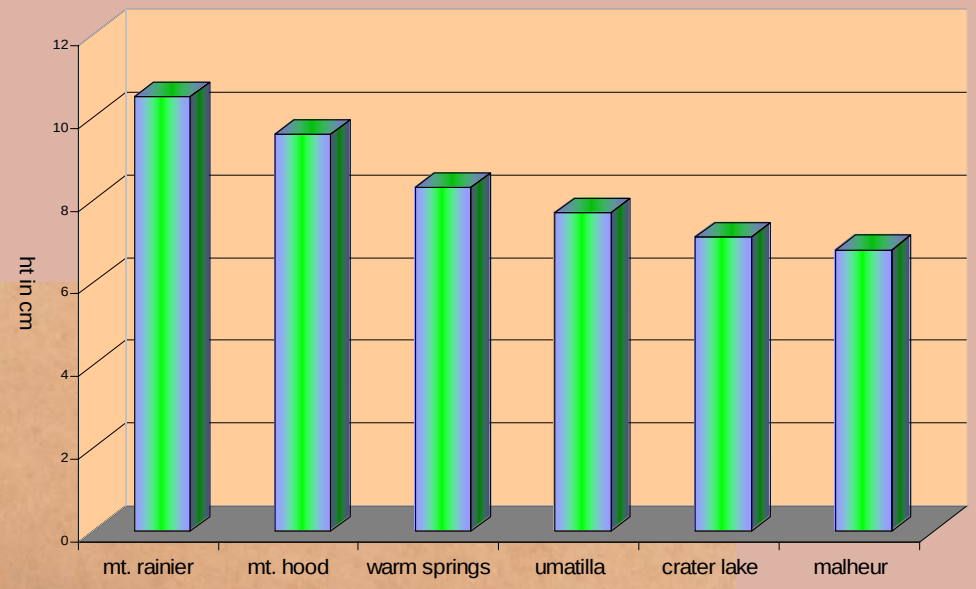
1-Year-Old Whitebark Pine Seedlings in Dorena Greenhouse

TLC for Individual Seedlings (Year 2)

2-Year-Old
Seedlings
Sow# 220
spp 101 / WBP
run 3
sy 04

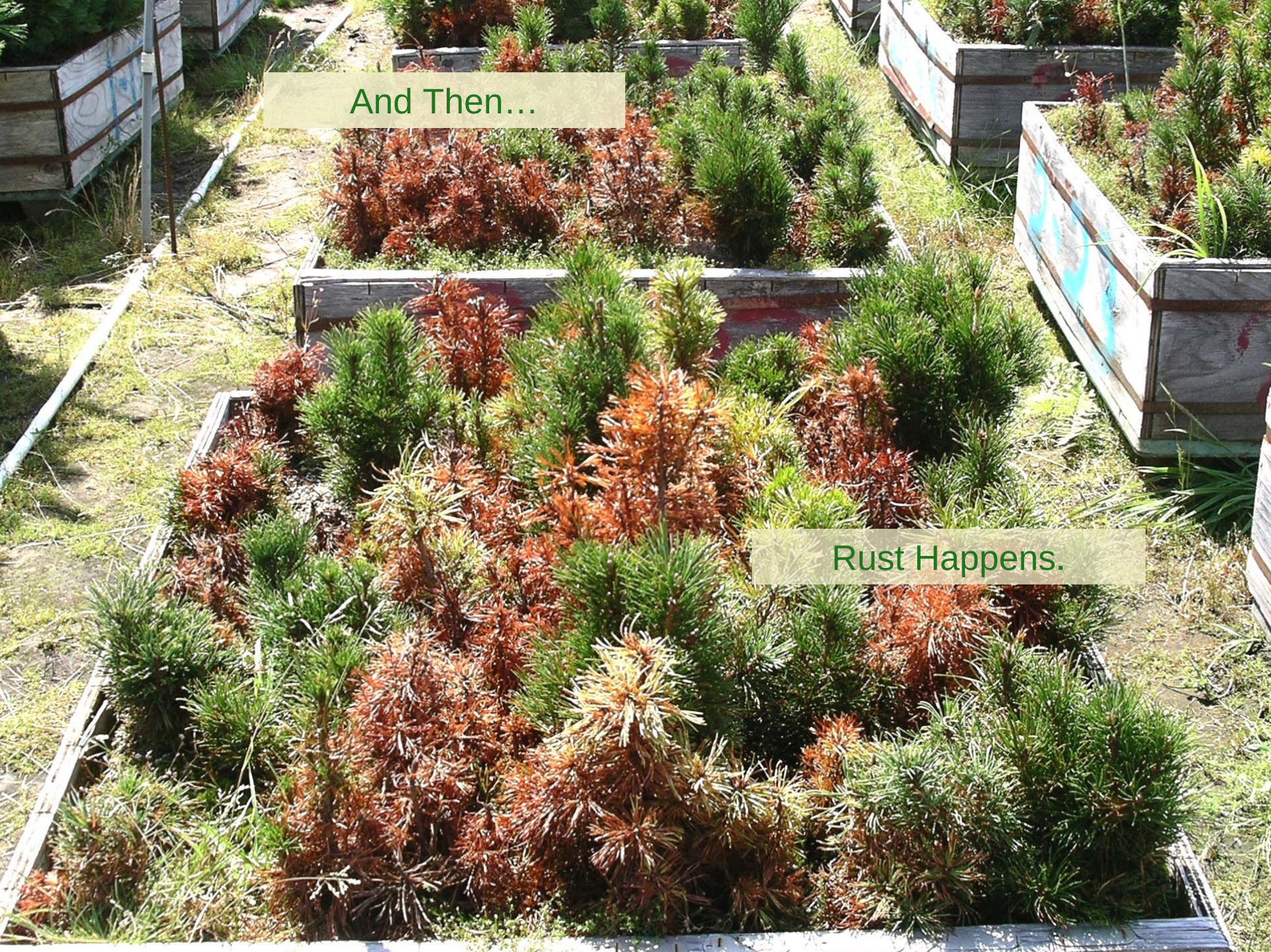
4-Year-Old
Rootstock

Large Variation in 2nd Year Heights

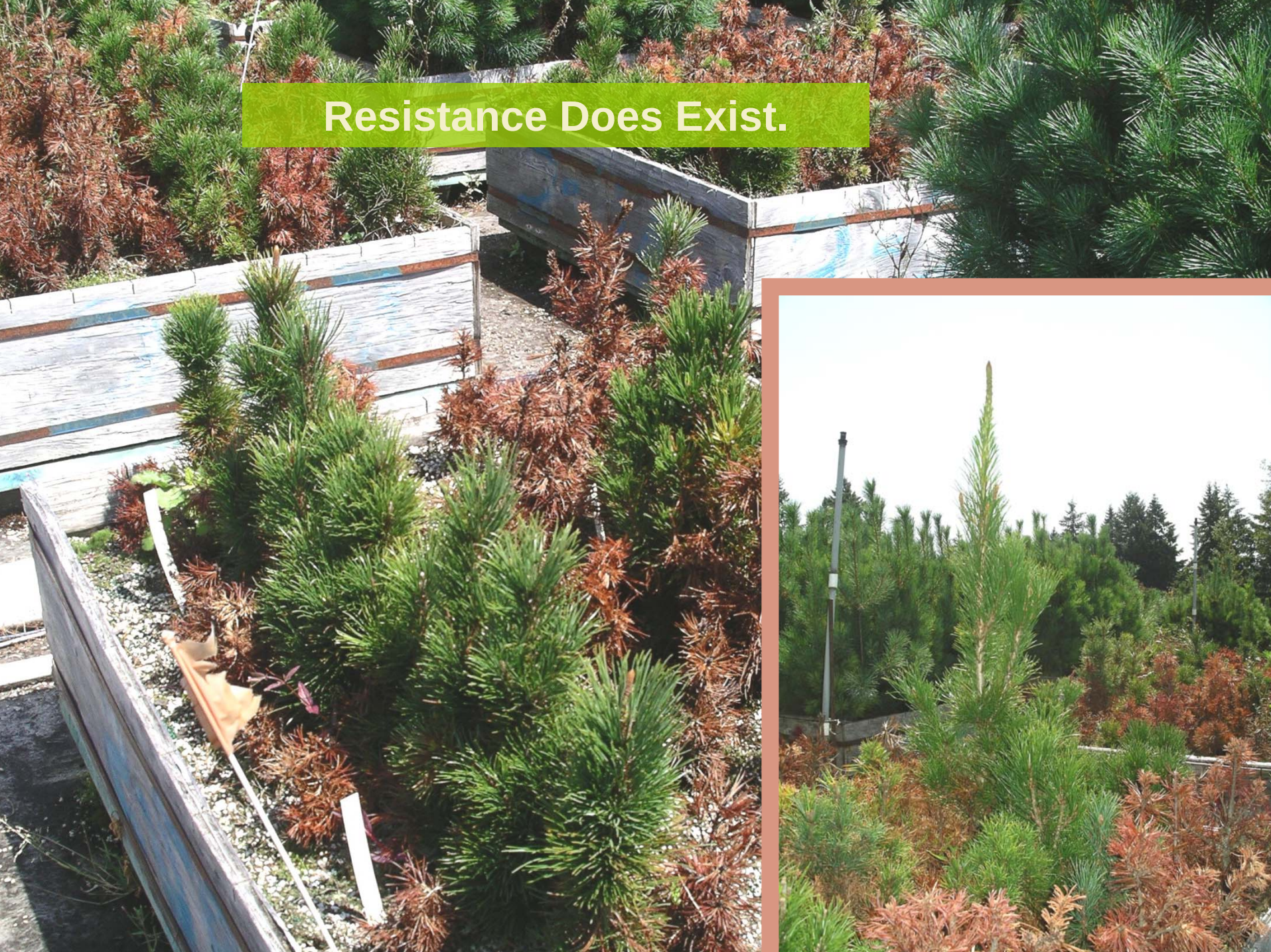


Selfing? Island Populations?

3-Year-Old Seedlings
(1 Year Following Transplanting)


And Then…
Rust Happens.

Resistance Does Exist.



Some Live Happily Ever After.

Photo courtesy of Chris Jensen, Deschutes NF, USDA Forest Service

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