

**The Container Tree Nursery Manual - Volume Seven**  
by Thomas D. Landis

Yes, it's finally done! With the help of co-authors Kas Dumroese and Diane Haase, I was finally able to finish the last of the CTNM series entitled Seedling Processing, Storage and Outplanting (Figure 1A). This volume covers the time from when the crop is hardened-off and ready for harvest to when they go in the ground. If it seems like a long time since Volume Six was published, you are right - nine years in all (Figure 1B). Many things, including my retirement from the Forest Service in 2004, contributed to this long gestation period but hopefully you will think that it was worth the wait.

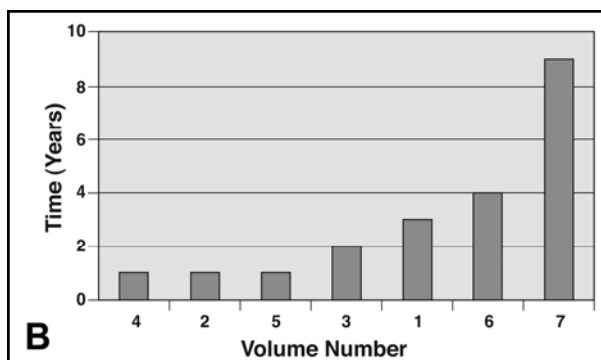
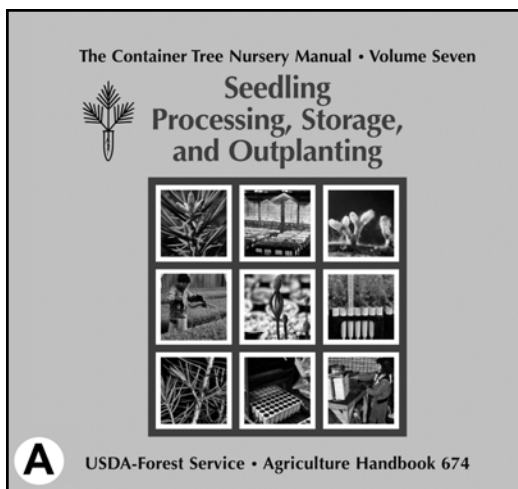


Figure 1A - Volume Seven of the Container Tree Nursery Manual series is finally finished (A). Many people were beginning to worry because each volume was taking longer to get published (B).

CTNM Seven is organized into six chapters:

**1. The Target Plant Concept** - This first chapter forms the conceptual basis for the rest of the book. The basic tenet is that nursery plant quality is determined by outplanting performance and cannot be described at the

nursery. There is no such thing as an “all-purpose” plant because quality depends on how the plants will be used—”fitness for purpose” (Ritchie 1984). Using the six steps in the Target Plant Concept (Figure 2), nursery managers work with their customers to define and then produce nursery stock that will be well adapted to the specific outplanting site.

**2. Assessing Plant Quality** - How to define nursery stock quality has always been a challenge, so for this chapter I enlisted the help of Gary Ritchie, retired plant physiologist from Weyerhaeuser. Although many “seedling quality tests” have been proposed in the past 50 years, most failed to stand the test of time and were not operationally useful. So, in this chapter, we define the various morphological, physiological, and performance attributes of plant quality as well as discuss how this information can be used in nurseries and on the outplanting site.

**3. Harvesting** - Methods of harvesting container stock across North America are a function of nursery size and location, plant species, research input, and tradition. This chapter discusses ways to determine the “lifting window” as well as the procedures used to grade the stock and prepare it for outplanting or storage.

**4. Storage** - Storing nursery stock is an operational necessity, not a physiological requirement as some nurseries ship directly after harvesting. However, for larger nurseries and those far from the outplanting sites, well-designed storage facilities are an essential feature. This chapter discusses open, sheltered, and refrigerated storage practices including the latest information on frozen storage. Ways to monitor the quality of stored stock as well as how to identify causes of overwinter damage round-out the chapter.

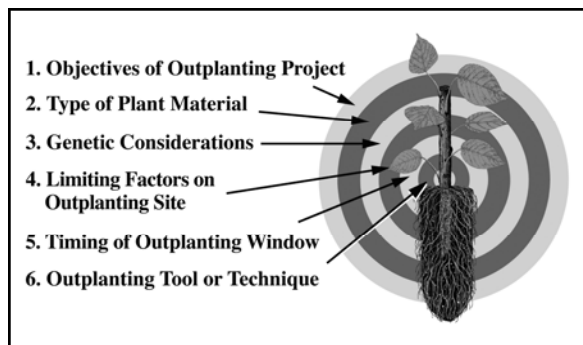


Figure 2 - The Target Plant Concept is crucial to outplanting success.

**5. Handling & Shipping** - Nursery plants are at their maximum quality immediately before they are harvested, but they then must pass through many hands

before being outplanted. Nursery stock is subjected to a series of potential stresses from harvest through outplanting, including temperature extremes, desiccation, mechanical injuries, and storage molds. Each stage in the process represents a link in a chain, and overall plant quality is only as good as the weakest link. The effect of these stresses is also cumulative so that seemingly minor problems can add up to serious damage. Often, these sublethal injuries are not immediately apparent but the damage only becomes evident as decreased survival and growth weeks or months after outplanting.

**6. Outplanting** - The final three steps of the Target Plant Concept (Figure 2) are critical to outplanting success and must be considered when planning and initiating outplanting projects. This chapter discusses pre-planting procedures as well as site preparation treatments that help improve a plant's ability to survive and grow. How to determine the proper plant spacing and select the best planting spots are also discussed as well as proper handling and planting techniques. Sections on the various types of hand planting tools (Figure 3A) and planting machines (Figure 3B) will be useful to reforestation and restoration specialists, especially since there hasn't been a new book on planting for many years. The latest information on treatments to prevent animal damage and fertilization at the time of outplanting are also discussed. Lastly, the types of surveys to determine planting quality and track outplanting success over time are presented.

**Publication Plans.** Like the preceding volumes, CTNM Seven will be published as Agriculture Handbook 674 which means that it will have to go through the editorial processes of both the Forest Service and the Department of Agriculture. This will take up to a year and so, to get this information out as quickly as possible, we're going to publish it first as a electronic book ("E-Book"). If you are not familiar with this format, the entire volume will be contained on a compact disk in Adobe PDF format.

We're producing a limited number of copies at this time so that we can have the chapters reviewed by subject matter specialists. That process will take several months with a final deadline of November 1. Then, we'll incorporate any changes and print up more E-books for sale and send them draft back to Washington, DC to start the editorial process for the hard copy printing. Hopefully, I'll be able to announce the printing in the Summer 2009 issue of FNN.

**How to Get a Copy.**

If you would like to be a reviewer or have some information you would like included in CTNM Seven, you can order a CD containing the review PDF files by contacting Tom Landis at the address in the inside front cover. The review draft is also available on the RNGR website:  
<http://www.rngr.net/Publications/ctnm/volume7>

If you would like to advance order an E-book of CTNM Seven which will be ready in November, you can contact Richard Zabel at:

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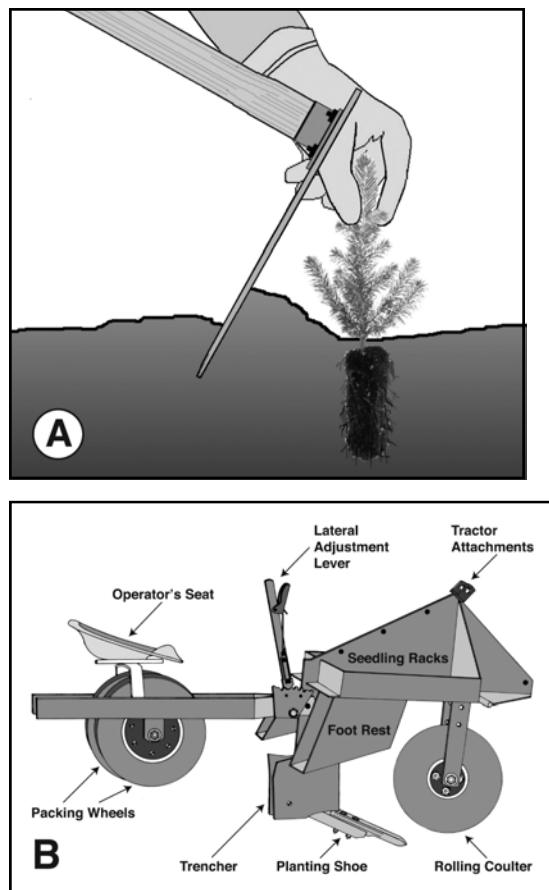


Figure 3 - CTNM Seven will be popular with both nursery workers and seedling users because it presents the very latest information on planting tools (A), machines (B), and techniques.