

# SEEDLING INVENTORY TRACKING

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*Kitchen J. 2003. Seedling inventory tracking. In: Riley L.E., Dumroese R.K., Landis T.D., technical coordinators. National Proceedings: Forest and Conservation Nursery Associations—2002. Ogden, UT: USDA Forest Service, Rocky Mountain Research Station. Proceedings RMRS-P-28: 139–143. Available at: <http://www.fcnanet.org/proceedings/2002/kitchen.pdf>*

## Abstract

A general discussion of seedling inventory tracking objectives and methods is presented, with consideration of future opportunities.

## Key Words

Pesticide tracking, seed collection, seed orchard, bareroot, container

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## SEEDLING INVENTORY TRACKING: WHERE ARE WE NOW?... AND WHERE ARE WE GOING?

I'd like to talk about where we are now in terms of seedling inventory tracking, and about where we may be in a few years. Please bear with me since my point of view is from our company's perspective, and from a Canadian perspective, where the regulatory environment probably makes information tracking more detailed and expensive, and may have a slightly different focus.

When tracking seedling inventory, there are 3 primary goals: 1) track the source, whether from seed collections, orchard production or vegetative propagation; 2) keep the customer informed about crop numbers and progress; and 3) meet regulatory requirements for seed transfer, pesticide use, and meet customer certification needs. There are many secondary goals, such as sales, production planning or budgeting; however, the first 3 goals can not be compromised to achieve secondary objectives.

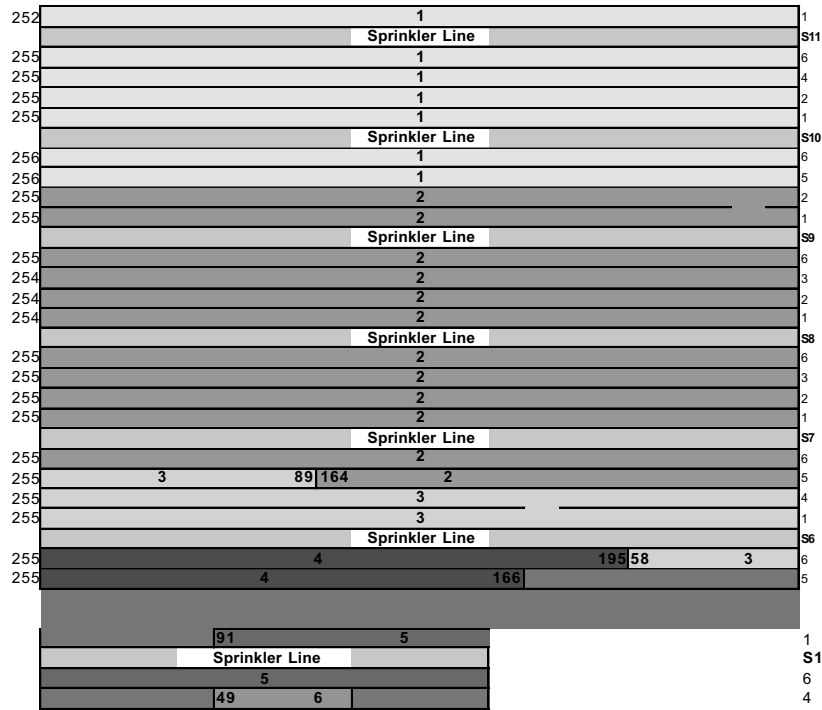
To track the source, facility maps of various kinds are used, including bareroot fields, container production facilities, and the containers themselves. Container trays should be marked to ensure seedling lots can be tracked without errors. Blocks are often moved, so marking is particularly important. Finally, shipping cartons should be clearly labeled. The value of genetically improved material will continue to rise, and therefore tracking the source material will become increasingly important.

Customers deserve and expect to be kept informed about the progress of their crops, and the number of seedlings to expect when it's time to plant. Keeping close track of contracts is a sure way to get off on the right track. Knowing customer expectations and communicating about expectations regularly is essential. Each nursery will have its own system for this, in order to meet other needs, but it must meet the three primary criteria mentioned. Inventory checks through the season can avert problems for both the nursery and the customer, and customers depend on the information to avoid future unexpected costs, such as brushing. Many models of handheld computers are helpful and all do essentially the same thing—assist the user to organize and collect data.

Keeping the customer informed about the growth of seedlings is not strictly an inventory activity; since both needs depend on the same information, systems can and should be integrated. The growth tracking system is critical for predicting where seedlings will end up, which is a key item for predicting seedling inventory.

Customers can also be kept informed via the internet. This offers the advantage of providing up-to-date information which can be conveniently accessed. This is particularly important when things are changing quickly, such as during lifting, shipping and planting. Third-party websites, such as Plant Wizard, allow nurseries and customers to share up-to-date inventories online. Nurseries and customers utilize the same data source, increasing efficiency of information sharing.

**PANEL 8 BAREROOT TRANSPLANTS (TRANSPLANTED 2001)**



1	WES 7-44-12-5-92 0.5+1.5 SX 2001ALTCR54 2806 Meters of 5063 meters total
2	IPAC 430-3.0 0.5+1.5 FC 2001USWCR45 3986 Meters
3	IPAC SN01 0.5+1.5 FC 2001USWCR11 1167 Meters
4	PFR B111204-421-3.0-66 0.5+1.5 FC 2001USMTCR02A 361 Meters
5	PFR R99016-412-4.5 0.5+1.5 FC 2001USMTCR01A 326 Meters
6	PFR R91121-412-4.5 0.5+1.5 FC 2001USMTCR04A 117 Meters
	FALLOW

Figure 1. Bareroot panel map for tracking seedlots.



Figure 2. Handheld computer in use for growth tracking.

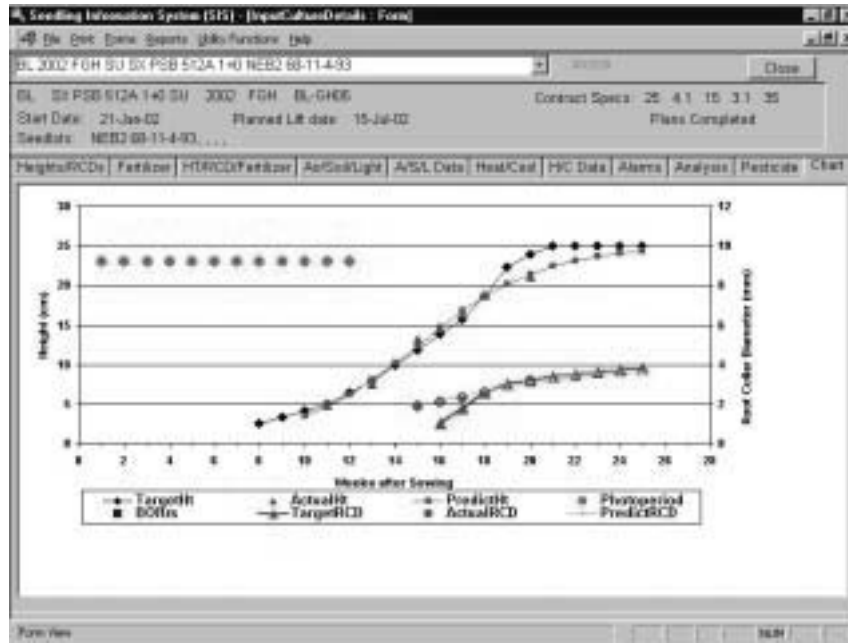


Figure 3. Growth curve is a record of growth and a tool for predicting final inventory.

Regulatory requirements must be met to keep nurseries and customers in business. Customers may need to report on silviculture plans and progress to retain cutting rights. Seed planning is often needed as well, and depends on seedling inventory results. In Canada, customers must have written and approved silviculture plans in place to obtain and retain cutting

rights. They will also need the same plans internally for budget purposes. Only good inventory and data tracking can lead to good seed planning for the future. Source material records are needed to verify that seed transfer rules have been followed, and that appropriate genetic material has been used for the destination. Third party certification needs, such as

**PRTA**  
 (PacifiC Resource Tracking and Analysis)

A Comma Separated Value file can be generated, so that you can work with the data electronically. From Internet Explorer (or Netscape) please right-click on the file name and choose the "save target as" option to download the file to your computer or to a folder on your network. The file can then be opened in MS Excel (Word, Lotus or other program that can read a .csv file).

• Job-S-2002ORDERSUMMARY.csv

**Customer: Pacific Inland Resources (PIR)**

**Customer Orders**  
 Spring 2002

Order Number	Qty	Type	Size	Age	Barriers	Seedling	Order Code	Requested Qty	Status	Trails	No. of Boxes	No. of Boxes Remaining	Updated
200206081407	50	PS	418	1+0	3.0	39624	1000	8007	128.9 Shipped	120.800	400	0	Nov 13, 2001
200206081408	50	PS	418	1+0	3.0	39624	1000	8007	144.0 Shipped	145.100	477	0	Nov 8, 2001
200206081409	50	PS	418	1+0	3.0	90040	750	801	136.0 Shipped	89.100	0	0	Nov 8, 2001
200206081410	50	PS	418	1+0	3.0	60040	950	801	136.0 Shipped	82.100	0	0	Nov 7, 2001
200206081411	50	PS	418	1+0	3.0	60040	950	817.0	Shipped	221.540	740	0	Nov 13, 2001
Spring 2002 Subtotal										470.0	817.000		
Summer 2002													
Order Number	Qty	Type	Size	Age	Barriers	Seedling	Order Code	Requested Qty	Status	Trails	No. of Boxes	No. of Boxes Remaining	Updated
200206081412	50	PS	418	1+0	3.0	60040	950	118.0	Inventory	130.800	814	0	Nov 23, 2002
200206081413	50	PS	418	1+0	3.0	90040	750	111.7	Inventory	111.700	815	0	Nov 23, 2002
Summer 2002 Subtotal										231.7	221.700		
<b>Customer Orders Subtotal</b>										<b>701.7</b>	<b>817.000</b>		

Shipping History    Shipping Request

Please friendly version

Figure 4. Inventory information provided to customer via the internet.

Seedling Properties - 2002 Summer													Current Inventories				
Original Qty	Trace	Seedlot	Sex	Size	Age	Ordered	Required	Internal surplus	External surplus	Inventory	Last Update	Status	Original Owner	Total Owned	IBR1	IBR2	SAMPLE
SAMPLE1	Trace	01114	OV	410	1+0	6,500	0			18,000	11/13/00	MS2	SAMPLE	18,000	8,998	-	1,000
SAMPLE2	Trace	44893	OV	415	1+0	3,200	0			3,000	11/13/00	MS2	SAMPLE	3,000	-	2,800	-
SAMPLE3	Trace	40574	SA	3120	1+0	2,500	0			2,000	11/13/00	MS2	SAMPLE	2,000	-	2,800	-
SAMPLE4	Trace	44806	SA	4120	1+0	2,300	0			3,000	11/13/00	MS2	SAMPLE	3,000	-	3,800	-
SAMPLE5	Trace	60863	FDC	4120	1+0	6,500	0			7,300	11/13/00	MS2	SAMPLE	7,300	7,300	-	-
SAMPLE6	Trace	61859	FDC	410	1+0	1,500	0			1,500	11/13/00	MS2	SAMPLE	1,500	-	1,500	-
SAMPLE7	Trace	60902	HV	412A	1+0	8,200	0			8,100	11/13/00	MS2	SAMPLE	8,100	8,100	-	-
SAMPLE8	Trace	60714	HV	410	1+0	1,000	0			1,200	11/13/00	MS2	SAMPLE	1,200	1,200	-	-
<b>Total</b>														<b>34,138</b>	<b>25,998</b>	<b>9,880</b>	<b>1,000</b>

Figure 5. Third party website provides inventory information.

chain of custody and sustainable silviculture, tracking may add further requirements.

Pesticide use reporting of some kind is required in many jurisdictions to retain the right to use pesticides. In other cases, customers may require records for their use. Generally speaking, pesticide use has its own set of regulations. Careful tracking and integration with inventory data may be important for both the nursery and the customer to continue doing business.

There are many secondary objectives for seedling inventory tracking including user-friendliness, keeping operational staff up-to-date with current inventories, knowing what's available for sale, invoicing and financial forecasts. All of these needs can be met, but must not be allowed to compromise the primary goals mentioned above—track the source, keep customers informed, and meet regulatory requirements.

So where are we going in the future? Information will be further automated and integrated between nurseries and customers, nurseries and suppliers, and with employees. The information will become more valuable. We will see new ways of counting, including machine vision and sensing. Bar codes and inexpensive chips will change the way we do things. Our systems will become faster and more flexible;

our customers will expect more information; they'll expect it to accurate and available “yesterday.”

User-friendliness is the most important secondary factor; people must be comfortable with systems to get the most from the available information and for the system to function as intended. Providing useful and complete information to operational staff gives them the best chance for success. It is also important to know about available extra stock, or your entire crop if it's been grown for later sale. Invoicing will depend on inventory at some point, and of course



financial forecasts will depend on updated seedling inventory tracking.

Information will be increasingly integrated with: customer systems; seed sourcing systems; and ultimately with field performance—the ultimate goal. We need to ask and challenge ourselves to answer the question, “How will we tie seedling inventory tracking to field performance in the future?” Certainly we will at some point.

The value of seedling pedigree will rise as genetic value in the field rises, and as more valuable material becomes available. This will change the emphasis of what we record, and why.

Ways of counting seedlings will change with the application of current and future technology. For example, computerized machine vision and sensing could be used in the future for plant health monitoring. We may someday use machine sensing to identify and verify source material. I’m sure we’ll see new ways of identifying fields, containers, cartons and maybe even seedlings! Furthermore, is it possible to use production reliability technology so that no counting will be needed?

What are the benefits of good inventory tracking to us as nursery people? While making a cool new spreadsheet may be great fun, we got into the job to grow trees.

Fast and flexible means good things for us too: *More time to do what we love*. We chose the profession because we love to grow things—trees! User-friendly, well designed systems that don’t require us to be computer experts, nor require us to do more things than are necessary, will help us achieve these goals.

So remember, track the source infallibly, keep customers informed, and meet regulatory requirements. Thank you again for the opportunity to speak; and thank you even more for your personal enthusiasm and commitment to high quality forest seedling production.

## **A FEW USEFUL SOURCES**

Landis TD, Tinus RW, Barnett JP. 1998. Seedling Propagation, Vol. 6. The Container Tree Nursery Manual. Washington (DC): USDA Forest Service. Agriculture Handbook 674. 167 p.



Crop Scheduling with Computers: <http://www.na.fs.fed.us/spfo/rngr/fnn/jul-98/cp798.htm#crop>

What is SPAR? (BC): [http://www.for.gov.bc.ca/tip/spar/what\\_is.htm](http://www.for.gov.bc.ca/tip/spar/what_is.htm)

Nursery Shipping and Administration (BC): <http://www.for.gov.bc.ca/nursery/headqtrs/nsa.htm>

Using the Pivot Table to Summarize Spreadsheet Data: <http://www.na.fs.fed.us/spfo/rngr/fnn/summer01/pivot.htm>

Pesticide Tracking Software: <http://www.na.fs.fed.us/spfo/rngr/fnn/jan-97/ipm.htm#track>

Various forestry IT solutions: [http://www.forestnet.com/archives/Nov\\_2001/tech\\_update.htm](http://www.forestnet.com/archives/Nov_2001/tech_update.htm)