QUESTIONNAIRE FOR

BAREROOT NURSERY TECHNOLOGY WORKSHOP

Nursery Name _____

Address _____

_____

Phone # _____

Names of Persons Completing Questionnaire:

Name	Position
_____	_____
_____	_____
_____	_____

Annual Nursery Production (1980)

Please list the major species grown at your nursery. Give the stock types and number produced in thousands of seedlings (M) for each species in 1980.

Species	Stock Type	Number Produced (Harvested)
		M
		M
		M
		M
		M
		M
		M
		M
Other minor species and	Stock types	M
Total Number of Seedlings Produced =		M

Land Usage

Please indicate the total number of acres/or hectares (circle one) your nursery utilizes for each area below.

Fallow or cover-cropped land	_____	Acres or Hectares
Seedbed area	_____	Acres or Hectares
Transplant area	_____	Acres or Hectares
Uncultivated land (buildings, roads, etc)	_____	Acres or Hectares
Unused land	_____	Acres or Hectares
Other	_____	Acres or Hectares
Total ----	_____	Acres or Hectares

Nursery Site Characteristics

From the list below, please indicate the five (5) most important criteria used to select your nursery site, where 1 is the most important, 2, the second most important, 3, the third most important, 4, the fourth most important, and, 5, the fifth most important.

_____ Climate
_____ Elevation
_____ Aesthetics
_____ Proximity to markets
_____ Water supply
_____ Soil depth
_____ Soil workability and drainage
_____ Cost of land
_____ Proximity to work force
_____ Soil fertility (including pH and cation exchange capacity)
_____ Local topography
_____ Politics
_____ Previous land use
_____ Freedom from weeds
_____ Soil texture
_____ Other _____

Site Problems - Most bareroot nurserymen realize that they do not have the""ideal" nursery site but "make-do" with what they have. The purpose of this portion of the survey is to identify major site problems and determine what can be done about them. On the table below, please indicate the 5 most serious site problems at your nursery, where 1 is the most serious problem; 2, the second most serious; 3, the third most serious; 4, the fourth most serious and, 5, the fifth most serious. Next, for these 5 site problems, list any corrective treatments that you have tried and whether these treatments have alleviated the problem.

Problem	Major Site Problem (Rank 1 through 5)	Corrective Treatments			
		Treatment	Is it effective?	Treatment	Is it effective?
SOIL					
Acidity					
Alkalinity					
Salinity					
Too "heavy"					
Too "light"					
Too much variation					
Compaction					
Poor Drainage					
Rocks					
Organic matter maintenance					
Soil slash					
Workability (tilth)					
Uneven topography					
CLIMATE					
Intense rainfall					
Frost pockets					
Frozen soil					
Excessively high temperatures					
Wind abrasion					
WATER					
Poor quality					
High water table					
Availability					
OTHER					

SOIL

Soil Characteristics

Please fill in the table below discussing the soil characteristics of your major soil types.
For each soil type indicate the % of cultivated land that it occupies, its pH, particle size distribution: % sand silt and clay, the drainage quality: good, fair or poor, the cation exchange capacity (me/100g), the bulk density (g/cm^3) and organic matter (%).

Soil type	% of cultivated land	pH range	Particle size distribution % sand silt clay (range)	Drainage (good, fair, or poor	Cation exchange capacity (me/100g)	Bulk Density (g/cm^3) (range)	Organic Matter (%) (range)
	%		% % %		me/100	g/cm^3	%
	%		% % %		me/100	g/cm^3	%
	%		% % %		me/100	g/cm^3	%

Sowing and Seedbed Density

Please fill in the table below discussing the sowing practice for the stock types produced in your two major species. For each, indicate the sowing date: optimum time (e.g. early May; mid April) and the actual range (e.g. late May to early June); the sowing depth in inches or centimeters; the type of mulch used, if any, and the depth applied; the target growing density (in the 2-0 year) (seedlings/ft^2); the seedling inventory (seedlings/ft^2) for 1-0's and 2-0's; and the cull X during grading.

Species	Stock Type of Final Product	Sowing Date		Sowing Depth (circle whether inches or cm)	Mulch		Target Growing Density Seedl/ft^2	Seedbed Inventory (Seedlings/ft^2)		Cull % During Grading
		Optimum Date (e.g. early May)	Actual Range (mid May to late June)		Type	Depth (in or cm)		1-0's	2-0's	
1.	1-0		to	in cm		in cm	/ft^2	/ft^2	/ft^2	%
	2-0		to	in cm		in cm	/ft^2	/ft^2	/ft^2	%
	3-0		to	in cm		in cm	/ft^2	/ft^2	/ft^2	%
	Other		to	in cm		in cm	/ft^2	/ft^2	/ft^2	%
2.	1-0		to	in cm		in cm	/ft^2	/ft^2	/ft^2	%
	2-0		to	in cm		in cm	/ft^2	/ft^2	/ft^2	%
	3-0		to	in cm		in cm	/ft^2	/ft^2	/ft^2	%
	Other		to	in cm		in cm	/ft^2	/ft^2	/ft^2	%

Fertilization

Please fill in the table below with the general fertilizer schedule for your 2-0 stock starting with the applications before sowing, then the applications made in the first year and, finally, the applications made in the second year up to the time of lifting. Indicate time of year of application (month), what type of fertilizer is applied, the amount applied in lbs/acre or kg/ha and finally the purpose for the application, e.g. to stimulate fall root growth.

This is the entire 2-0 fertilizer schedule for the major species grown at our nursery which is _____
Species Name

	Age of Stock at Time of Application	Time of Year of Application (Month)	Type of Fertilizer Applied (e.g. Ammonium Phosphate 11-55-0)	Amount Applied lbs/acre or kg/ha (circle one)	Purpose of Application (e.g. fall root growth)
Application Before Sowing	0			lbs/acre or kg/ha	
				lbs/acre or kg/ha	
				lbs/acre or kg/ha	
Applications in First Year	1-0			lbs/acre or kg/ha	
				lbs/acre or kg/ha	
				lbs/acre or kg/ha	
Applications in Second Year	2-0			lbs/acre or kg/ha	
				lbs/acre or kg/ha	
				lbs/acre or kg/ha	

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Root Culturing

Please fill in the table below discussing your root culturing regime for growing 2-0 seedlings of your major species. For undercutting, wrenching and lateral pruning, list the age of the stock at the time of the operation (e.g. 1-0), the date(s) of the operation, the depth at which you draw the blade(s) (in. or cm.) and the purpose for doing the operation (e. g. to harden-off seedlings, stimulate root growth, etc.).

This is the root culturing regime for 2-0 seedlings of our major species, _____
Give Species Name

Root Culturing	Age of Seedlings at Time of Operation (e. g. 1-0)	Date(s) of Operation (month/day)	Depth at which you Draw the Blade (in or cm) (circle one)	Purpose of Operation (e.g. to Harden-off Seedlings)
Under-Cutting		/	in cm	
		/	in cm	
Wrenching		/	in cm	
		/	in cm	
		/	in cm	
		/	in cm	
		/	in cm	
		/	in cm	
Lateral Pruning or Sidecutting		/	in cm	
		/	in cm	
		/	in cm	
		/	in cm	

TRANSPLANTING

In the table below discuss the transplanting regime for your major species and stock types. Indicate the species, stock type of final product (eg. plug-1, 1-1, 2-1), the time of year (month(s)) seedlings are lifted, stored, and transplanted, the root length of seedlings to be transplanted, the density of the bed immediately after transplanting and at the time of lifting (seedlings/ft^2) and the final number of seedlings produced after culling (seedling/ft^2).

Species	Stock Type (final product)	Time of Year . . .			Pruned Root length in/cm (circle one)	Density of Transplant Bed		Number of seedlings produced after culling (seedlings/ft^2)
		Lifted months)	Stored month(s)	Transplanted month(s)		At time of transplanting	At time of lifting	
					in cm	/ft^2	/ft^2	/ft^2
					in cm	/ft^2	/ft^2	/ft^2
					in cm	/ft^2	/ft^2	/ft^2
					in cm	/ft^2	/ft^2	/ft^2
					in cm	/ft^2	/ft^2	/ft^2
					in cm	/ft^2	/ft^2	/ft^2
					in cm	/ft^2	/ft^2	/ft^2

Please, indicate the percentage of seedlings transplanted in the fall versus spring:

Fall = _____ %

Spring = _____ %

Total = 100 %

Which do you prefer, fall or spring transplanting and why? _____

_____

WEEDS

Please fill in the table below with your weed control schedule. Indicate what conifer species are in the seedbed at the time, the timing of the application (g pre-seeding, spring of 2-0 year, etc.), the machine hours per acre of mechanical weeding and/or the person hours/acre of handweeding and/or the full name of the herbicide applied in The ai/acre or kg ai/acre, and finally list the plants which you are attempting to control.

Conifer Species in Seedbed	Application Timing (e.g. pre-seeding)	Mechanical Weeding (machine hours/acre)	Handweeding (person hours/acre)	Full Name of Herbicide and Amount (lbs ai/ acre or kg ai/acre) (circle one)	For control of what weeds? (e.g. annual grasses)
		machine hrs/acre	person hrs/acre	lbs ai/acre kg ai/acre	
		machine hrs/acre	person hrs/acre	lbs ai/acre kg ai/acre	
		machine hrs/acre	person hrs/acre	lbs ai/acre kg ai/acre	
		machine hrs/acre	person hrs/acre	lbs ai/acre kg ai/acre	
		machine hrs/acre	person hrs/acre	lbs ai/acre kg ai/acre	
		machine hrs/acre	person hrs/acre	lbs ai/acre kg ai/acre	
		machine hrs/acre	person hrs/acre	lbs ai/acre kg ai/acre	
		machine hrs/acre	person hrs/acre	lbs ai/acre kg ai/acre	

Pests

Please discuss your pest management program in the table below. First rank the major peat groups where 1 is the greatest problem as a pest, 2, the next greatest problem, 3, the next, 4, the next, 5, the next, end, 6, the least important problem. Then discuss the severity of the problem for each specific peat; is it heavy, moderate, slight or non-existent as a problem; list the species and stock-type that the pest affects; answer whether the pest is increasing or decreasing as a problem (check me) and finally discuss the major methods of control that you have used: soil fumigation, seed treatment, drench, sprays (check as many as you use) and cultural controls (list those used).

Major Pest Croup (rank from 1 through 6)	Specific Pest	Severity of Problem (check one)				Species and Stock Type which Pest Affects	Is this Pest Increasing or Decreasing as a Problem? (check one)		Methods of Control(check as many as you use) Fungicide/Insecticide				Cultural Controls (List)
		Heavy	Moderate	Slight	Non-Existent		Increasing	Decreasing	Fumigation	Seed Treatment	Drench	Sprays	
__Diseases of Seeds and Geraminants	1. Damping off (Pythiums, Rhizoctonia etc.)												
	2. Seed Fungi												
__Diseases of Roots and Root Collars	1. Fusarium Root Rot												
	2. Nematodes												
	3. Phytophthora												
	4. Cortical Rot (Fusarium Roseum												
	5. Charcoal Root Rot (Macrophomina Phaseoli)												
__Diseases Affecting Shoots	1. Sirococcus Blight												
	2. Fusarium Top Blight												
	3. Melampsora Foliage Rust												
	4. Western Gall Rust												
	5. Gray Mold (Botrytis)												
__Molding of Stored Seedlings	1. Fungal Molds												
__Insects and Allied Pests	1. Springtail Insects												
	2. Cutworms												
	3. Marsh Crane Fly												
	4. Root and Vine Weevil												
	5. Aphids												
	6. Cranberry Girdler												
	7. European Pine Shoot Moth												
	8. Balsam Woolly Aphid												
__Birds and Mammals	1. Deer												
	2. Rodents												
	3. Birds												
	4. Rabbits												
	5. Moles												

Inventory of Equipment or Method Used

Please indicate the kind of equipment or methods now used at your nursery. If it is commercially available, please list the make, model, or type. Also indicate whether or not the equipment or method fulfills its function well? And, if the answer is no, discuss why the equipment or method is unsatisfactory, for reasons that may be related to the high cost of equipment, maintenance or fuel or is it due to low operational efficiency, i.e., the equipment or method does not do the job well resulting in lower product quality or product loss.

1. CONE STORAGE AND HANDLING

Equipment or Method	Make, Model, or Type	Does Equipment or Method Fulfill its Function Well?	If No: Why is Equipment or Method Unsatisfactory?
____ Forklift	_____	____ Yes ____ No	_____
____ Conveyor	_____	____ Yes ____ No	_____
____ Manual	_____	____ Yes ____ No	_____
____ Tray Storage	_____	____ Yes ____ No	_____
____ In Sack Storage	_____	____ Yes ____ No	_____
____ Rack Storage	_____	____ Yes ____ No	_____
____ Loose Storage	_____	____ Yes ____ No	_____
____ _____	_____	____ Yes ____ No	_____
____ _____	_____	____ Yes ____ No	_____

2. SEED PROCESSING

Equipment or Method	Make, Model, or Type	Does Equipment or Method Fulfill its Function Well?	If No: Why is Equipment or Method Unsatisfactory?
_____ Preheat Bins	_____	_____ Yes _____ No	_____
_____ Extractor	_____	_____ Yes _____ No	_____
_____ Scalper	_____	_____ Yes _____ No	_____
_____ Dewinger	_____	_____ Yes _____ No	_____
_____ Fanning Mill/Clipper	_____	_____ Yes _____ No	_____
_____ Specific Gravity Separator	_____	_____ Yes _____ No	_____
_____ Powered Conveyors	_____	_____ Yes _____ No	_____
_____ Cone Grinders	_____	_____ Yes _____ No	_____
_____ _____	_____	_____ Yes _____ No	_____
_____ _____	_____	_____ Yes _____ No	_____

3. SEED STORAGE AND HANDLING

_____ Refrigerated Storage	_____	_____ Yes _____ No	_____
_____ Nonrefrigerated Storage	_____	_____ Yes _____ No	_____
_____ Freezer Storage	_____	_____ Yes _____ No	_____
_____ Cans	_____	_____ Yes _____ No	_____
_____ Sacks	_____	_____ Yes _____ No	_____
_____ Cartons	_____	_____ Yes _____ No	_____
_____ _____	_____	_____ Yes _____ No	_____
_____ _____	_____	_____ Yes _____ No	_____

4. FUMIGATION

Equipment or Method	Make, Model, or Type	Does Equipment or Method Fulfill its Function Well?	If No: Why is Equipment or Method Unsatisfactory?
Granular Applicator		Yes No	
Liquid Applicator		Yes No	
Shank Injector		Yes No	
Tarp Layer		Yes No	
Tarp Remover		Yes No	
		Yes No	
		Yes No	

5. GENERAL CULTIVATION & GROUND PREPARATION

Plow	Yes No	
Rototiller	Yes No	
Disc	Yes No	
Harrow	Yes No	
Chisel	Yes No	
Leveler	Yes No	
Packer	Yes No	
Rod Weeder	Yes No	
Rock Picker	Yes No	
	Yes No	
	Yes No	

6. SOWING

Equipment or Method	Make, Model, or Type	Does Equipment or Method Fulfill its Function Well?	If No: Why is Equipment or Method Unsatisfactory?
_____ Bed Marker	_____	_____ Yes _____ No	_____
_____ Bed Maker	_____	_____ Yes _____ No	_____
_____ Drill Seeder	_____	_____ Yes _____ No	_____
_____ Broadcast Seeder	_____	_____ Yes _____ No	_____
_____ Mulch Spreader	_____	_____ Yes _____ No	_____
_____ Bed Sander	_____	_____ Yes _____ No	_____
_____ Bed Roller	_____	_____ Yes _____ No	_____
_____ _____	_____	_____ Yes _____ No	_____
_____ _____	_____	_____ Yes _____ No	_____

7. IRRIGATION

_____ Ditch	_____	_____ Yes _____ No	_____
_____ Overhead Oscillation	_____	_____ Yes _____ No	_____
_____ Overhead Impulse (Fixed)	_____	_____ Yes _____ No	_____
_____ Overhead Impulse (Portable)	_____	_____ Yes _____ No	_____
_____ _____	_____	_____ Yes _____ No	_____
_____ _____	_____	_____ Yes _____ No	_____

8. FERTILIZATION

Equipment or Method	Make, Model, or Type	Does Equipment or Method Fulfill its Function Well?	If No: Why is Equipment or Method Unsatisfactory?
Granular Applicator		Yes No	
Liquid Gravity Applicator (Drenching)		Yes No	
Liquid Pressure Sprayer		Yes No	
Soil Injector		Yes No	
Irrigation		Yes No	
Manure Spreader		Yes No	
		Yes No	
		Yes No	

9. SOIL AMENDMENTS

Manure Spreader		Yes No	
Mulch Spreader		Yes No	
Apricultural Seed Drill		Yes No	
		Yes No	
		Yes No	

10. SEEDBED CULTIVATION

Equipment or Method	Make, Model, or Type	Does Equipment or Method Fulfill its Function Well?	If No: Why is Equipment or Method Unsatisfactory?
Path Cultivator (Hand)		Yes No	
Path Cultivator (Mechanized)		Yes No	
Row Cultivator (Hand)		Yes No	
Row Cultivator (Mechanized)		Yes No	
Pipeline Cultivator (Hand)		Yes No	
Pipeline Cultivator (Mechanized)		Yes No	
		Yes No	
		Yes No	

11. ROOT PRUNING

Side Root Pruner (Disc)		Yes No	
Side Root Pruner (Fixed)		Yes No	
Bottom Root Pruner (Fixed)		Yes No	
Bottom Root Pruner (Reciprocating)		Yes No	
Root Wrencher			
		Yes No	
		Yes No	

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12. TOP PRUNING

Equipment or Method	Make, Model, or Type	Does Equipment or Method Fulfill its Function Well?	If No: Why is Equipment or Method Unsatisfactory?
Hand Shearing		Yes No	
Rotary Mower		Yes No	
Sickle Bar		Yes No	
		Yes No	
		Yes No	

13. HERBICIDE AND INSECTICIDE SPRAYING

Hand Sprayer		Yes No	
Tractor Mounted Boom Sprayer		Yes No	
Trailer Mounted Boom Sprayer		Yes No	
Mist or Dust Blower		Yes No	
		Yes No	
		Yes No	

14. FROST PROTECTION

Irrigation		Yes No	
Smudge Pots		Yes No	
Covering (Plastic Sheet)		Yes No	
		Yes No	
		Yes No	

15. TRANSPLANTING

Equipment or Method	Make, Model, or Type	Does Equipment or Method Fulfill its Function Well?	If No: Why is Equipment or Method Unsatisfactory?
Hand Transplanting Board		Yes No	
Self-Propelled Transplanter		Yes No	
Tractor Drawn Transplanter		Yes No	
		Yes No	
		Yes No	

16. FIELD LIFTING

Rigid Undercutting Blade		Yes No	
Rigid Undercutting Blade W/Agitator		Yes No	
Manual Lifting ___ % -- If seedlings are lifted both manually and		Yes No	
Mechanical Harvesting ___ % mechanically, give approximate percentage		Yes No	
of each used.		Yes No	
		Yes No	

17. FIELD HANDLING

Boxes		Yes No	
Bins		Yes No	
Tubs		Yes No	
Fabric, Slings		Yes No	
		Yes No	
		Yes No	
		Yes No	

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18. FIELD TRANSPORT

Equipment or Method	Make, Model, or Type	Does Equipment or Method Fulfill its Function Well?	If No: Why is Equipment or Method Unsatisfactory?
Trailer		Yes No	
Truck		Yes No	
Forklift		Yes No	
		Yes No	
		Yes No	
		Yes No	

19. GRADING AND COUNTING

Stationary Table		Yes No	
Moving Belt		Yes No	
Counter (Mechanical or Electrical)		Yes No	
Counter (Weight)		Yes No	
Counter (Manual)		Yes No	
		Yes No	
		Yes No	
		Yes No	
		Yes No	

20. SEEDLING PACKAGING

Equipment or Method	Make, Model, or Type	Does Equipment or Method Fulfill its Function Well?	If No: Why is Equipment or Method Unsatisfactory?
Mechanical Bundling		Yes No	
Manual Bundling		Yes No	
Boxes		Yes No	
Bags		Yes No	
Bales		Yes No	
Crates		Yes No	
Stapler		Yes No	
Taper		Yes No	
Stitcher		Yes No	
Baler		Yes No	
Packing Medium		Yes No	
		Yes No	
		Yes No	

21. SEEDLING STORAGE

Refrigerated Storage		Yes No	
Non-Refrigerated Storage		Yes No	
Humidify Control		Yes No	
Permanent Racks		Yes No	
Pallet System		Yes No	
Palleteer System		Yes No	
		Yes No	
		Yes No	

22. SEEDLING HANDLING

Equipment or Method	Make, Model, or Type	Does Equipment or Method Fulfill its Function Well?	If No: Why is Equipment or Method Unsatisfactory?
_____ Forklift	_____	_____ Yes _____ No	_____
_____ Skids	_____	_____ Yes _____ No	_____
_____ Carts	_____	_____ Yes _____ No	_____
_____ Belt Conveyor	_____	_____ Yes _____ No	_____
_____ Roller Conveyor	_____	_____ Yes _____ No	_____
_____ _____	_____	_____ Yes _____ No	_____
_____ _____	_____	_____ Yes _____ No	_____

23. SHIPPING FOR OUTPLANTING

_____ Refrigerated	_____	_____ Yes _____ No	_____
_____ Non-Refrigerated	_____	_____ Yes _____ No	_____
_____ Common Carrier	_____	_____ Yes _____ No	_____
_____ _____	_____	_____ Yes _____ No	_____
_____ _____	_____	_____ Yes _____ No	_____

24. SPECIALIZED ON-SITE TRANSPORTATION

_____ Buses	_____	_____ Yes _____ No	_____
_____ Crew Carriers	_____	_____ Yes _____ No	_____
_____ Scooters	_____	_____ Yes _____ No	_____
_____ _____	_____	_____ Yes _____ No	_____
_____ _____	_____	_____ Yes _____ No	_____

25. TRACTORS

Make, Model, and Horsepower	Crawler	Wheeled	Gas	Diesel	Does Equipment or Method Fulfill its Function Well?
					____ Yes ____ No
					____ Yes ____ No
					____ Yes ____ No
					____ Yes ____ No
					____ Yes ____ No
					____ Yes ____ No
					____ Yes ____ No

What 3 pieces of nursery equipment need the most improvement? List in priority order.

	Equipment	What needs to be improved?
1.		
2.		
3.		

Please estimate the number of seasonal workers employed by your nursery last year in the four functions listed.

	Number of Seasonal Employees	
	Minimum	Maximum
Cone harvesting		
Seed processing		
Nursery seedling production		
Seedling packing shed operation		

How many permanent employees do you have?

We realize that this questionnaire has taken a considerable amount of your time and want to sincerely thank you. The information produced by this survey will insure the success of the Bareroot Nursery Conference and make the resulting Proceedings a valuable bareroot nursery manual.

Mary Duryea, Oregon State Univ.

Tom Landis, USDA - Forest Service