Equipment and Supplies For Collecting, Processing, Storing, and Testing Forest Tree Seed

U.S. Department of Agriculture
Forest Service General Technical Report SO-13

Southern Forest Experiment Station

SUMMARY

This publication is a directory of information on equipment and supplies used in handling and treating tree seed. Ten classes of equipment are arranged by types. The use of each device is briefly described. Specifications such as size, capacity, or model number are given. Manufacturers' or suppliers' names are listed, and users of the equipment are identified.

ACKNOWLEDGEMENT

The author would like to thank the International Union of Forest Research Organizations Working Party S2.01.06 for their work in gathering the data for this report.

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compiled by

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1977

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BY F. T. BONNER

INTRODUCTION

This survey of tree seed equipment is the result of a work project of IUFRO Working Party S2.01.06, Seed Problems, which was planned at a symposium on seed processing at Bergen, Norway, in September 1973. Questionnaires were mailed to all members of the Working Party, and replies were organized into the following classes of equipment:

Cone, Fruit, and Seed Collection Equipment
Cone Kilns, Other Extraction Devices
Cleaning/Processing Equipment
Mixing and Sampling Equipment
Moisture Testing Equipment
Storage Equipment
Germinators
Seed Counters
X-ray Equipment
Specialized and Miscellaneous Equipment

Some information has been supplied on uses, specifications and manufacturers, and laboratories that own and use the equipment are listed by a number code. Readers who desire more detailed information may contact the manufacturer or user.

Other catalogs of seed equipment and supplies exist. The most detailed catalog is the excellent "Survey of Equipment and Supplies" published by ISTA in 1975, which covers mainly the cleaning and handling of small samples and laboratory testing. The ISTA catalog includes chemicals and common laboratory items, which are not included in this IUFRO catalog. Two catalogs of tree seed and nursery equipment have also been published by the U.S. Forest Services' Equipment Development Center in Missoula, Montana. Both of these catalogs primarily cover U.S. manufacturers. (see p. 35).

EXPLANATION OF DIRECTORY

Equipment was grouped into the 10 broad classes listed previously and further grouped into type of equipment (column 1 of the table). For example, the first class is "Cone, Fruit, and Seed Collection Equipment." Type designations are: Hydraulic Devices, Climbing Devices, Devices to Remove Fruits from Trees, and Miscellaneous.

Under column 2, the use of the equipment is briefly described. The letters P (practical use), R (research work), or L (laboratory use) were given to suggest the kind of operation in which the equipment is normally used.

Column 3, specifications, includes as much information about size, capacity, model number, etc. as could be inserted. All values are converted to the metric system, and if other information has been published, a citation is given.

Manufacturer addresses (if known) are given in column 4. Some respondents gave addresses of suppliers, not manufacturers, in their returned questionnaires. In most of these cases, no attempt was made to identify the manufacturer; often a supplier's address is more useful anyway. If the equipment was home-made in local shops and laboratories, the term "local" will appear in this column.

Column 5 lists the users of the equipment. All laboratories or agencies are identified by a number code (see p. 31), which is based on a geographic system used in an earlier Working Party report (Wiersma, 1976).

Cone, Fruit, and Seed Collection Equipment

Type	Use	Specifications	Manufacturer	User
Hydraulic Devices				
Hydraulic platform	collection (P)	Hydra-Ladder Model HL 18-C	Hydra-Ladder, Inc. P. O. Box 472 Higginsville, MO 64037 USA	106
Hydraulic platform	collection (P)	- -	Eidg. Austalt f. d. Furstl. Versuchswesen, CH-8903 Birmeusdorf, Switzerland	362
Hydraulic platform	collection (P)	tractor-mounted	Hymec, Ltd. Örnsköldsvik, Sweden	452
Hydraulic platform	pollination, collection (P)	Trump Giraffe, 1G 40, 15 m high, Truck-mounted	Trump, Ltd. Kelowna, B.C. Canada	153
Hydraulic platform	collection (P)	Girette, self-propelled hydraulic platform, 4.5 m high	Trump, Ltd. Kelowna, B.C. Canada	153
Hydraulic lift	collection (P)	High Ranger tractor-mounted	unknown	104
Hydraulic bucket	collection (L,P,R)	Skyworker 6950, on International 1700 truck	Skyworker Hughes Keenan Div. Coffect Mfg. Co. London Rd. Delaware, OH 43015 USA	105
Climbing Devices				
Tree bicycle	collection (P)	Baumvelo Tree Bicycle	H. Schneebeli & Co. Schaffhauserstr. 307 Zurich 50 Switzerland	390, 360, 702, 802, 362, 322, 703
Ladders	collection (P,R)	Ecole de Nancy	Ateliers Bega Blvd. d'Austrasie 54000-Nancy, France	320, 321
Ladders	photography, collection (R)	Model #5510, Truck-mounted 9 m high, 360° rotation	McCabe-Powers Body Co. St. Louis, MO, USA	102
Ladders	collection (P)	Swedish pipe ladder	SV. Albertsen Havnen DK-3050 Humlebaek, Denmark	400, 390, 702
Ladders	collection (P)	Model TA10, reach to 10 m	Alufort Colombes, France	322
Ladders	collection grafting (P,R)	W1-BE, 3 m base sections 3 m extensions	AB Wikstrand & Berg Mora, Sweden	425, 802
Ladders	collection (P)	- -	Tønsberg Jernindustri Stokke, Norway	425
Ladders	pollination, collection (P)	9 m high, 4 folding platforms	local	700

Type	Use	Specifications	Manufacturer	User
Climbing Devices				
Ladders	collection, pollination (P,R)	see Danbury (1969)	local	800
Ladders	inspection, collection (R)	see Rietveld (1975)	local	101
Ladders	collection (P)	- -	local	703, 704
Ladders	collection	see Asakawa and Fujita (1962)	local	610
Special equipment	collection (L)	Muschter-Tompa	local	581
Climbing spurs	collection (P)	"Foot hooks"	State Seed Extraction Plant Postbox 118 N-2301 Hamar, Norway	400
Climbing spurs	collection	- -	Canadian Forestry Equipment, Ltd. 5489 Royalmount Ave. Montreal, Quebec, Canada	154
Climbing spurs	collection (P)	Czech model	local	425
Climbing spurs	collection (P)	- -	local	620
Safety belts, harness	collection (P)	Pakawa, Ser. No. 24926, Type BS1 III	Barrow Hepburn & Gale, Ltd., P. O. Box 413 Grange Rd., London	425
Safety belts, harness	collection (P)	Rene´ type Harness for mountainering	(?) France	322
Safety belts, harness	collection (P)	Edelrid rock climbing type	(?) Switzerland	425
Safety belts, harness	collection	- -	Canadian Forestry Equipment, Ltd. 5489 Royalmount Ave. Montreal, Quebec, Canada	154
Safety belts, harness	collection (P)	use with Baumvelo Tree Bicycle	local	360
Safety belts, harness	collection (P)	Czech model	local	425
Catapault	projects rope over branches (P)	- -	ArSiMa Lngangstrade 25 Denmark	620
Catapault	collection (P)	- -	local	801
Devices to Remove Fruits from Trees				
Mechanical tree shaker	shake cones from tree (P)	Schaumann Shaker	H. C. Schaumann & Sons DK-5882 Vejstrup, Denmark	400, 425

Type	Use	Specifications	Manufacturer	User
Devices to Remove Fruits from Trees				
Mechanical tree shaker	shake cones from tree (P)	Shockwave	Orchard Machinary Corp. Yuba City, CA 95991 USA	104
Cone rake	removing cones from outer branches (P)	- -	For. Comm. 25, Drumsheugh Gardens Edinburgh 3, U.K.	390
Cone rake	removing cones from outer branches (P,R)	base studded with 2 rows of 5 to 7 cm nails; spacing depends on cone size	local	152
Cone hook	cut cones from branch (P)	includes knife, tube, and bag	Skogsdon, Ltd. Stockholm	452
Cone hook	cut cones from branches (P)	"Felco 3"	(?) Switzerland	801
Cone hook	cut cones from branches (P)	metal bar, looped end, width adjustment	local	800
Cone hook	cut cones from branches (P)	- -	local	704, 620
Pruner	cut off branches	- -	Canadian Forestry Equipment, Ltd. 5489 Royalmount Ave. Montreal, Quebec, Canada	154
Pruner	cut off branches (R,P)	2m handle, parrot-beak	(?) Australia	801
Pruner	cut off branches (R)	Newman heavy-duty trimmer	Newman Mfg. & Sales Co. Kansas City, KS, USA	100
Pruner	cut off branches (R,P)	"Commando" see Hall et al, (1972)	out of business	801
Rifles	shooting off branches (R)	Remington Speedmaster Model 552.22 and Bushnell Scopechief .22, 3X-8X variable scope	Remington Arms, Inc. Ilion, NY, USA Bushnell Optical Co. Dept. 0198, Pasadena, CA 91107, USA	104
Rifles	shooting off branches (R,P)	Sako "Forester", 0.243 with 4 x 81 Pecar scope	Sako, Finland	801
Rifles	shooting off branches (R,P)	Tikka. "Ithaca" 0.243 with 4 x 81 Pecar scope	Tikka, Finland	801
Miscellaneous				
Cone bag	collecting cut cones (P)	- -	local	620
Cone bags	collecting cones	10, 72, and 108 liter capacity	local	154
Vacuum sweeper	collect Ulmus off lawns (P)	vacuum pickup, self propelled	Giant Vac. Mfg. Co. South Willington, CT 06265, USA	153

Cone Kilns, Other Extraction Devices

Type	Use	Specifications	Manufacturer	User
Kilns				
Tobacco kiln	drying Pinus, Eucalyptus (P)	D.800 "Mini;" diesel-fired, electrical fan; 7.5 x 2 m	Delanco (Pty.) Ltd. Box 283, Brits Transvaal, S. Africa	700
Tobacco kiln	drying (P)	9 x 4.8 m or 9 x 6 m: run at 46°C.	local	802
Small electric	drying (R)	300 watt	Mutumi Sci. Inst. Co., Ltd. No. 15, Honcho, Nihonbashi, Chuoo-ku, Tokyo, Japan	610
Small electric	drying (L,R,P)	2 pre-heating chambers; heat control at 4 levels; can run 4 lots of 1 kg at once.	Benno Schilde Maschinenban AG Bad Hersfeld, West Germany (FDR)	360, 362 370
Kiln	drying (P)	Martin, Model 218 Type MAC	Martin Furnace/Eng. Pty. Ltd., 168 Euston Rd., Alexandria Sydney, Australia	801
Kiln	drying	Anhydric 90 x 62 x 61 cm	Blackworse Lare Walthanstow E. London	704
Kiln	drying (L,R)	reversible cross-circulation	Moore Dry Kiln Co. of Canada, Ltd. P. O. Box 68 Brampton, Ontario, Canada (custom-built)	154
Kiln	drying (L,R)	- -	Officine Meccanicge Giuseppe LANDI-Via Aretina n. 50 Florence, Italy	381
Laboratory oven	drying (L,R)	Thelco, Model No. 31543	Fisher Sci. Co., Ltd. 196 W. Third Ave. Vancouver, B.C. VSY 1E9	152
Extractor	drying	Seed Extractor, Model KKA	AB Svenska Flaktfabriken, Stockholm	702
Kiln	drying (P,R)	Ventilatortrocken-Schrauk TU 1	Herens GMBH Hanau, West Germany (FDR)	370
Drawer kiln	drying small lots (P,R)	80 x 98 x 150 cm, wire mesh trays, 1 hl cap.	J. Scott and Co. Ltd. West Silvermills Lane Edinburgh EH 35D (custom-built)	300
Progressive drying tunnel	pre-dry cones (P)	6 x 1.5 x 2.5 m; 24 hl cap.; 20°-40°C.	local	300
Drum kiln	drying (P)	2.4 m long, 0.75 m diam, 8 hl cap.; storage tray above	local	300
Drum kiln	drying (P)	20 m^3 capacity cylinder; 4 HP fans; 20 drums can dry 15 tons of cones in 2 days	local	322

Type	Use	Specifications	Manufacturer	User
Kilns				
Drying cabinet	drying cones and seeds	2 units, 640 kg cap.	local	361
Rotary kiln	drying (L,R)	electric	local	321, 581
Cone kiln	drying (P)	45 kg cap. ERTI	local (For. Res. Inst.)	580
Kiln	drying (P)	direct oil fired; vertical heat diffuser; 24°-93°C.	local	106
Dryer	drying (R)	gas-fired; 8 bu. cap.	local	104
Drying kiln	drying (P,L)	2 electric heaters, 2 fans; 8 cone boxes, 5 kg per box	local	360
Drum kiln	drying Larix (P,R)	- -	local	370
Rotating drums	drying (P)	vertical system on 3 floors 20 hl cap.	A/S Hamjern Hamar, Norway (custom-built)	425
Oven	drying (L,R)	600 W electric heater; fan; 89 x 91 x 76 cm; 2 tiers of 11 trays	local	154
Progressive kiln	drying (P)	20 netting boxes, 1.5 hl cap. per box	local	425
Cabinet kiln	drying (P,L,R)	- -	local	425
Internal fan	drying (P,L,R)	trays for cones; 20°-70°C.	local	452
Kiln	drying (P,R)	wire netting trays (see Morandini, 1961)	local	400
Cone dryer	drying extracting (R)	dryer with tumbler	local	610
Drying Sheds, Houses, Rooms				
House	drying (P)	flue-heated building	local	703
Room	drying (P)	custom-made vegetable drying	Ets SEURET 18, rue Thiers Auxonne, France	320
Shed	drying (P)	4.5 x 4.5 x 2 m; gas furnace, fan; wire-bottom trays	local	153
Shed	drying large Amounts (P)	- -	local	362
Shed	drying (P)	15 m X 12 m; wire-bottom trays	local	703

Type	Use	Specifications	Manufacturer	User
Other Devices				
Electric Larix mill	tear apart closed cones (L,P)	- -	H. Schneebeli and Co. Schaffhauserstr. 307, Zurich 50 Switzerland	360
Electric Larix mill	tear apart closed cones (P)	Condux-Zahnscheiben-Mühle, Type H 35	Oertli and Co. CH-8307 Effretikon, Zurich	362
Drying racks	drying cones (P)	steel, caster rollers, 74 cm wide, 178 cm long, 183 cm high; uses 9 wooden frame trays with screen bottoms	Union Steel Products Albion, MI 49224	106
Extraction tray	drying (P)	plastic covers; uses heat from sun	local	620, 703
Black plastic	drying (R)	black plastic sheets; uses heat from sun	local	100
Storage trays	drying (P)	wooden crates with wire mesh bottoms	local	362
Drying trays	drying (L,R)	wooden sides, 61 x 107 cm wire mesh bottoms	local	154

Type	Use	Specifications	Manufacturer	User
Tumblers				
Snoco screen drum	extraction from cones, pods (P)	rotating screen drum	The Snow Co. Omaha, NB 68101 USA	153
Cone tumbler	extraction from cones (P)	- -	A. Doumas Route de Poleymieux Albigny-Su-Saône, France	320
Cone tumbler	extracts seeds (R)	60 cm diameter wire drum turned by motor	local	102
Cone shaker	extracts seeds (P)	conical drum, 3 m long; end diam. 127 and 91 cm; 6 mm mesh screen; turns at 30 rpm	local	106
Tumbler	Pinus extraction (P)	assembled on electric concrete mixer	local	801
Tumbler	Small sample extractor (P,R)	square box; hand-turned	local	153
Cone tumbler	extracts seed from cones (P)	barrel 3 m long, 122 cm diam.	local	802
Cone shaker	Pinus silvestris Picea abies (R)	romboid of metalic net rotates on short axis; capacity 10 ℓ cones	local	450
Screen drum	separates seeds (P)	- -	local	322
Tumbler	extraction of seed (P)	hand-operated; large model progressive; 500 bags of cones/day	local	703
Cone tumbler	extraction of small lots (L,R)	see Harris (1970)	local	152
Cone tumber	extraction from cones (P)	- -	local	700
Cone shaker	extraction from cones (P)	- -	local	154
Dewingers				
Nordmark dewinger	conifer dewinging (P)	Nordmark, sizel, Wolfgang Model	Streckel & Schrader K.G. 2 Hamburg 70 Postfach: 13453 West Germany	321
Nordmark dewinger	conifer dewinging (P)	Nordmark, sizel, Wolfgang Model Also	Landmaschinen AA Bern-Bümplitz-Süd CH-3018 Bern Switzerland	362
Nordmark dewinger	conifer dewinging, large lots (P)	Nordmark, Size 00 Wolfgang Model; 2 kg capacity; some local modifications	Georg Restle Propr. W. Feierabend, Mudhlen-u. Specherbau, Wiesbaden West Germany	360

Type	Use	Specifications	Manufacturer	User
Dewingers				
dewinger	dewing small lots (P,R)	Liliput Model	Streckel & Schrader Hamburg West Germany	370
Crippen dewinger	most conifers (P)	Crippen Dewinger and Aspirator; Model EP-26	Crippen Mfg. Co., Inc. Alma, MI 48801 USA	106
Sharples dewinger	Abies, Larix, Pinus, Picea (P)	60 cm Sharples-Kason Virbroscreen	The Sharples Co. Tower Works, Doman Rd. Camberley, Surrey England	300
Concrete mixer	wet dewinging (P)	Lescha VM 140	Leonhard Schmid KG 89 Augsburg West Germany	425*/
Dybvig macerator	any winged seed (L,P,R)	ca. 1 HP electric motor drive	Melvin Dybvig 208 Main Tillamook, OR 97141, USA	100, 153
Clipper debearder	Fraximus, Acer Liriodendron (P)	variable drive unit	Ferrell-Ross Co. 6501 S. Interpace Dr. P. O. Box 26468 Oklahoma City, OK 73126 USA	106
Seed scarifier	dewing small lots (R)	Forsberg Sample Scarifier, electric	FredForsberg & Sons Thief Rivers Falls, MN 56701, USA	100, 106, 153, 600
Vacuum dewinger	dewing Psendotsuga (L, R)	Electrolux Vacuum Cleaner	any home appliance outlet	151
Vacuum dewinger	wet dewinging small lots (L,R)	Membranefilter SM 16829 plus vacuum pump	Kebo-Grave Ltd. Stockholm	452
Wet dewinger	small Pinus lots (R)	Osterizer "Pulse-Matic"	John Oster Mfg. Co. Milwaukee, WI	100
Brush dewinger	dewing conifers (P)	- -	A. Doumas Route de Poleymieux Albigny-Su-Saône France	320
Vacuum dewinger	wet dewinging small lots (R)	series of small containers tied to vacuum source	local	450
dewinger	dewing conifers (P)	- -	local	322
dewinger	dewing conifers (P)	Mod. Kohmann-Saylund (principle of Prof. Schmidt)	local	425

*/ Other concrete mixers used by 100, 452, 154.

Type	Use	Specifications	Manufacturer	User
Depulpers				
Dybvig macerator	depulp fleshy fruits (P,L,R)	ca. 1 HP electric motor drive	Melvin Dybvig 208 Main Tillamook, OR 97141, USA	100, 106, 153
Blender	depulp small lots (R)	Osterizer "Pulse-Matic"	John Oster Mfg. Co. Milwaukee, WI	100
Blender	depulp small lots (R)	Wareing Model PB 5A	Wareing Products Corp.	153
Cone Cleaners				
Cone grader	cleans cones (P)	"Amazone", Model FOK, 3/4 HP motor	Landmaschinen AG Bern-Bümplitz-Süd CH-3018 Bern Switzerland	362
Cone cleaner	cleans cone lots (P)	Sherwen High Resonance, screens 0.6 x 1.2 m	Fraser & Chalmers Engine Works Erith, Kent England	300
Screen Cleaners				
Vibration sieves	separates seed from scales (P)	Vibrationssiebmaschine Varius, 600/1200/2	Condux-Werke Wolfgang bei Hanan, West Germany	362
Clipper cleaner	cleaning, sizing (L,R,P)	Clipper office tester; screens 25 X 38 cm	Ferrell-Ross Co. 6501 S. Interpace Dr. P. O. Box 26468 Oklahoma City, OK 73126, USA	100, 102, 106, 153, 154
Clipper cleaner	cleaning, sizing (P)	Clipper M2B	Ferrell-Ross Co. (see above)	153
Clipper cleaner	cleaning sizing (P)	Clipper No. 27	Ferrell-Ross Co. (see above)	106
Seed cleaner	cleaning, sizing (P)	Burrows Vac-a-Way, No. 30	Burrows Equip. Co. 1316 N. Sherman Ave. Evanston, IL 60201 USA	801
Cleaner/grader	cleans small lots (P,L)	Minipetkus, Model C	Röber Saatreiniger O.H.G.I. 495 Minden Westfallen 2 West Germany	321
Scalper	removes large trash (P)	Speed Scalper, Model 3651	Seedburo Equip. Co. 618 W. Jackson Blvd. Chicago, IL 60606 USA	106
Seed cleaner	cleaning, sizing (P)	2-screen model, with fan	Robert Boby Ltd. Bury St. Edmunds, Suffolk, England	300
Seed cleaner	cleaning (P,R)	Wiljak Model	W. Jäger Königswinter, West Germany	370
Seed cleaner	scalping (P)	CFC 54	Maskinfabriken CFC Strib, Denmark	425

Type	Use	Specifications	Manufacturer	User
Screen Cleaners				
Seed cleaner	cleaning, sizing (P)	LA-LS	Kamas, Kvarnmaskiner AB, Fack, S-200 42 Malmo 7, Sweden	452
Seed cleaner	cleaning, sizing (P)	Petkus I, with size 4 dust control	Landmaschinen AG Bern-Bümplitz-Süd CH-3018 Bern Switzerland	362
Scalper	removes large trash (P)	- -	A. Doumas Route de Poleymieux Albigny-sur-Srône, France	320
Seed cleaner	cleans small lots (L,R)	QB-123	Labor Instrument Works 1450 Budapest, P.O. B. 33 Hungary	580
Needler	removes needles, flat trash (P)	- -	local	106
Seed cleaner	cleans lots (P)	38 cm Fan, collection boxes	local	703
Seed cleaners	cleaning, sizing (P)	- -	local	322
Sieves, Screens				
Shaking sieves	cleaning, sizing, (P,R)	MK II, holds 10 sieves	Endecotts (Test Sieves) Ltd. London SW 19 England	152, 300
Shaking sieves	cleaning, sizing (R)	Test Sieve Jel 200	Gallenkamp P. O. Box 290 Technico House Christopher Str. London E.C. 2 England	701
Shaking sieves	cleaning, sizing (P,R)	FOK 401	A. Baumüller Marktredwitz West Germany	370
Hand screens	cleaning Eucalyptus (L,R,P)	wire cloth, rectangular holes	Ferrell-Ross Co. 6501 S. Interpace Dr. P. O. Box 26468 Oklahoma City, OK 73126, USA	105
Hand sieves	cleaning, sizing (R,P)	Greenburn Brass Lab. sieves, B.S.S. standards	Greer & Ashburner Pty., Ltd. 85 Cremorne Str. Richmond, Vic. 3121 Australia	801
Hand screens	sizing (L,R)	44 hole sizes 663-1681-1	Polikeit, Halle East Germany	581
Hand sieves	cleaning (P)	made from palm leaves	local	704

Type	Use	Specifications	Manufacturer	User
Pneumatic Cleaners				
Pneumatic separator	cleaning *Pinus* (P)	Mandrel ESM, 2 1/2 HP, Dry Product Model	Mandrel Products 6909 SW Freeway Box 36306 Houston, TX 77036 USA	700
South Dakota blower	cleaning small lots (L,R)	Models A, B	E. L. Erickson Prod. Brookings, S.D. 57006, USA	151, 153
South Dakota blower	cleaning small lots (L,R)	Model D	E. L. Erickson (see above)	104, 300, 400
South Dakota blower	cleaning small lots, or *Eucalyptus* (L,R)	Model 1836-3 (small blower for *Eucalyptus*	Burrows Equip. Co. 1316 Sherman Ave. Evanston, IL 60201 USA	105, 801
Seed blower	separate full & empty clean *Eucalyptus* (L,R)	Model ER General Seed Blower	Seedburo Equip. Co. 618 W. Jackson Blvd. Chicago, IL 60606 USA	100, 600
Seed aspirator	clean small lots (R)	Funnel 23 cm diam., 51 cm tall	Precision Machine Co. Lincoln, NB USA	102
Seed aspirator	clean small lots (L,R)	200 g capacity	Craftsman Machine Co. 201 Princess St. Winnipeg, Man. Canada	154
Air cleaner	clean small lots (L,P)	Nordströms Blåsterapparat	AB G. L. Jacoby Stockholm, Sweden	425
Seed cleaner	clean small lots (R)	2-stage aspirator	Lindner & May Brisbane, Australia (custom-made)	802
Winnower	clean light trash (P)	office fan	any commercial make	802
Fanning mill	cleaning (P)	- -	A. Doumas Route de Poleymieux Albigny-sur-Saône	320
Seed blower	cleaning small lots *Pinus*, *Abies*	"Silen-type", with modifications (see Wollard & Silen, 1973)	local	152, 450
Seed blower	cleaning *Betula* (R)	(see Bjorkroth, 1972)	local	450
Seed cleaner	cleaning small seeds (L,R)	vertical air column	local	452
Seed cleaner	cleaning small lots (R)	air separation	local	340
Seed cleaner	extract and clean *Populus* (R,L)	compressed air blows seed through wire mesh	local	154

Type	Use	Specifications	Manufacturer	User
Gravity Separators				
separator	cleaning (P)	Latka 34-B	Damas DK-5764 Vester, Aby, Denmark	620, 700
separator	cleaning (P)	Damas Type TRYLU 125-B	Damas (see above)	400, 425
separator	grading, separating (R)	Damas Type Lakas and Latka Lab model	Damas (see above)	801
densimetric grader	grader (P,L)	"Vibragen" Model	SOCAM 7 Blvd. Jean Jaures 28000-Chartres France	321
gravity table	sizing removing empties (P)	Model 10M2	Fred Forsberg & Sons Thief River Falls, MN 56701, USA	106
gravity table	sizing grading (P)	- -	Oliver Mfg. Co., Inc. P. O. Box 512 Rockyford, CO 81067, USA	322
gravity separator	grading large lots (P)	LA-K	Kamas Kvarnmaskiner AB Fack, S-200 42 Malmo 7, Sweden	452
gravity separator	cleaning, grading (P,R)	Model V135	Triple/S Dynamics Sutton/Overstrom, Inc. 1029 S. Haskell Dallas, TX 75223 USA	100, 300
Flail-shaker	cleaning (P)	trash and wings separated on shaking tray	local	802
Flotation Separators				
Seed cleaner	remove empty *P. sylvestris* and *Picea abies* (R)	flotation in alcohol, small smaples only (see Simak, 1973)	local	450
Seed cleaner	remove empty and damaged *Betula* seeds (R)	flotation in carbon tetrachloride/hexane (see Bjorkroth, 1973)	local	450
Drying Equipment				
Seed drier	reduce moisture content (P)	forced draft, 30°-40°C; cap. 9 x 5 kg *Abies*	local (Natl. Inst. Agr. Eng., Wrest Park, Silsoe, Bedford, England)	300

Mixing and Sampling Equipment

Type	Use	Specifications	Manufacturer	User
Mixers, Dividers				
Divider	mix and sample (R,P)	Boerner Divider (inverted cone type)	Burrows Equip. Co. 1316 Sherman Ave. Evanston, IL 60201 USA	100, 106, 425, 801, 154
Divider	mix and sample (R,P)	Gamet Precision Divider, (electric)	Dean Gamet Mfg. Co. 6427 Penn Ave. Minneapolis, MN 55440, USA	100, 801
Divider	mix and sample (P)	QB-105	Labor Instrument Works 1450 Budapest, P.O. B. 33 Hungary	580
Divider	mix and sample (L)	- -	Mahesh Agro Industrial and Auto Engg. Corp. 13-A/39 WEA. Pusa Rd. New Delhi-5, India	600
Mixer	mix for uniformity (P)	100 ℓ and 120 ℓcap. CFC 87-3, CFC 254-1	Maskinfabriken CFC Strib, Denmark	425
Mixer	mix for uniformity (P)	1000 kg cap. (Picea)	Carier East Street Braintree, Essex England	300
Mini-Seed Divider	mix and sample (L)	hooper 12 x 8.5 cm, cardboard	local	425
Divider	mix and sample (L)	like cups method	local	380
Drying Equipment				
Seed drier	dry small lots after wet dewinging (P)	standard fan	Sv. Fläktfabr. Ltd.	452
Seed drier	dry after wet dewinging (P)	revolving drum, 1.4 m long, 38 cm diam.; 2 kw heat	local	300
Seed drier	reduce moisture before storage (P)	electric heat, 2 sections	local	425
Seed drier	reduce moisture (P)	- -	Dydra St. Mammes, France	322

Type	Use	Specifications	Manufacturer	User
Miscellaneous Equipment				
Syntron vibratory Feeder	maintain even flow rate into cleaners (P)	Model FT0B, 5 x 25 cm trough; Model FT01, 10 x 46 cm trough	FMC Corp. Syntron Div. 1938 Black St. Homer City, PA 15748 USA	300
Color separator	grading (P)	Sortex	Gunsons Sortex Ltd. London, England	322
Dust exhaust	remove dust from cleaning machines (P)	Entstäubungsapparat R 300/1200	Munster Fabrik Für Luft-und Wärmetechnische Apparate CH-4132, Muttenz Switzerland	362
Triers, Samplers				
Trier, sleeve-type	pull samples (P,L)	Burrows No. 518, 46 cm	Burrows Equipment Co. 1316 North Sherman Ave. Evanston, IL 60201 USA	425
Sampling stick	pull samples (P)	86 cm long, 3 compartments	Bryan Corcoran, Ltd. London, England	300
Double-tube trier	pull samples (P,L)	64 cm long	local	425
Sample splitter	reduce size of sample (P)	- -	local	300
Cone, Fruit Cutters				
Seed cutter	viability estimation (L)	QB-127	Labor Instrument Works 1450 Budapest, P.O. B. 33 Hungary	580
Cone cutter	longitudinal slicing, (P,L,R)		local	425
Cone knife	longitudinal slicing (P)	25 cm pivoted blade, adjustable	local	300
Acorn/cherry cutter	viability est. (L,P)	knives mounted on steel base, pivoted on blade end	local	106
Seed Analysis Boards				
Purity work board and diaphano scope	purity analyses (L)	stainless steel, center section opal glass	Seedburo Equipment Co. 1022 W. Jackson Blvd. Chicago, IL 60607 USA	600
Seed analysis table	all seed analyses	QB-134	Labor Instrument Works 1450 Budapest, P. O. B. 33 Hungary	580

Moisture Testing Equipment

Type	Use	Specifications	Manufacturer	User
Gravimetric Testers Which Dry Seeds				
Brabender oven	seeds and cones (P,F,R)	resistance heaters dry seeds; scale read-out in % moisture	Brabender O.H. Duisburg, West Germany (FDR)	360, 370, 425, 381
Infra-red drier	seeds (P,L)	"Infradior" Model	V. Buys 59175 Templemars/eslille France	320, 321
Infra-red drier	seeds (L,R)	"Ultra-Duplex"; 2 IR heat bulbs dry seeds; scale read-out in % moisture	A. Gronert 4914 Kachtenhausen Lippe West Germany (FDR)	360
Infra-red drier	seeds (R,P)	Ohaus Model C 6000; 10 g samples	Ohaus Scale Corp. 1050 Commerce Ave. Union, NJ 07083 USA	106, 153
Infra-red drier	seeds	A.S.E. Balance, No. 719; 250 W.	A.S.E. Palmtag West Germany	300
Infra-red drier	cones in field	X-14 Agat; 150 W	AB G. L. Jacoby Stockholm Sweden	425
Infra-red drier	seeds (P,L,R)	Mettler LP 12	Mettler Instruments, Ltd. Zürich, Switzerland	802
Infra-red drier	seeds (P,L)	"Ultramat"; 1IR bulb, scale read-out in % moisture	Carl Bittmann Wissenschaftl. Forschungs-Instr. CH-4003 Basel, Switzerland	362
Electric Meters, Indirect Measure				
Electric meters	seeds (P,L,R)	Burrows 400 (also Dole 400); portable (formerly Radson meter)	Burrows Equipment Co. 1316 N. Sherman Ave. Evanston, IL 60201 USA	100, 104 300, 700, 701
Electric meter	seeds (P,L,R)	Super-Beha	N. Foss Electric 39 Roskildevej DK-3400 Hillerod, Denmark	400, 401, 620, 702, 801, 802
Electric meter	seeds (L,R)	Model 400-G	Seedburro Equipment Co. 618 W. Jackson Blvd. Chicago, IL 60606 USA	380, 600
Electric meter	cones and seeds (P)	Klein Feuchtemesser Type 2122	Fabrik Elektro-Physikalischer Geräte Karl Weiss KG Greiz, West Germany (FDR)	425
Electric meter	seeds (L,R)	Motomco Model 919	Motomco, Inc. Patterson, NJ 07513 USA	100

Type	Use	Specifications	Manufacturer	User
Direct Moisture Determinations				
Karl Fischer apparatus	(R)	Karl Fischer Tritator E551	Metrohm AG CH-9100 Herisau, Switzerland	380
Karl Fischer apparatus	(R)	Precision Auto-Aquatrator Model 68830	Precision Scientific Co. Chicago, IL 60680 USA	100
Brown-Duvel tester	(L,R)	electric distillation, 1- or 2-sample models	Seedburro Equip. Co. 618 W. Jackson Blvd. Chicago, IL 60606 USA	600
Toluene distillation apparatus	(L,R)	Bidwell/Sterling, Dean/Stark glassware (see Hart and Golumbic, 1963; Buszewicz, 1962)	any laboratory glassware supplier (see ISTA catalog)	100, 152 380, 425, 801
Marcuson distiller	(L,R)	"Di Marcuson"	Ditta Prokeme via G. Fabroni 48/R Firenze Italy	381
Drying Ovens				
Oven	drying seeds, fruits (L,R)	Model 125A or 125B	Tempo Ind. Corp. Bombay-57 India	600
Oven	drying seeds, fruits (L,P)	Model EM 10	M. Chopin and Co. S.A.R.L. 5, Rue Escundier 92100-Boulogne Billancourt, France	320, 321, 322
Oven	drying seeds (R)	Temp. range 0°-200° C	Burchi and Tuci Florence, Italy	380
Oven	drying seeds (L)	Heraeus Type RT 360	W. C. Heraeus GMBH Hanau, West Germany (FDR)	425
Oven	drying seeds (L,R)	- -	Polikeit Halle, East Germany (GDR)	581
Oven	drying seeds (P,R)	Qualtex Model 71 range 0°-200°C.	Watson Victor, 95-99 Epping Rd. North Ryde, N.S.W. 2113, Australia	801
Oven	drying seeds (L)	OV 300, Size 1	Gallenkamp & Co., Ltd. Technical House Christopher Str. London EC2P	300
Oven	drying seeds (P,L)	Thermo Circulator, 0°-200°C.	Labline Instr. Labline Plaza 15th & Bloomingdale Ave. Melrose Park, IL 60160 USA	106

Type	Use	Specifications	Manufacturer	User
Miscellaneous				
Hygroscope cards	indicate moisture in storage drums (P)	TL 6685 003 A1	Dydra St. Mammes, France	322

Storage Equipment

Type	Use	Specifications	Manufacturer	User
Walk-in Units				
Refr. room	storage (R)	2.4 x 2.4 x 2.4 m -10° and +4°C.	Windman Co. St. Paul, MN USA	102
Refr. room	storage (P)	Therma-Kühlmaschine Typ. WH4F90 +3° and -5°C.	Therma, Kältebüro Zurich, CH-8042 Switzerland	362
Refr. room	long-time storage (P)	Climatfroid (Satam) 80 m^3; -18° to -40°C.	Climatfroid (Satam) France	322
Refr. room	storage (P)	4.4 x 2.2 x 3 m + 2-3°C.	Therma, Kälte und Klima CH-8000 Zurich, Switzerland	360
Refr. room	storage (P,R)	various sizes, built into building	Carrier Corp. Syracuse, NY USA (refrigeration)	152
Refr. room	short storage for high-moisture seeds (P)	Neve 80 m^3, +7°C.	Neve Satam France	322
Refr. room	medium to long storage (P)	Neve, 100 m^3, +1°C.	Neve Satam France	322
Refr. room	storage (P,R,L)	0° to 5°C. no humidity control	local	106, 340, 620, 700 703, 801, 802
Refr. room	storage (P)	+1 to 3°C., 30-35% real humidity; 50,000 kg capacity	local	425
Refr. room	storage (R)	2° to 4°C., 35-45% rel. humidity; 3 x 6 x 2m	local	100
Refr. room	storage (P)	-9° to -7°C., 20,000 kg capacity	local	425
Refr. room	storage	-12°C.	local	104
Reach-In Units				
Refrigerator	storage	Frigomatic FWF-165	Autofrigor SA CH-8000 Zurich Switzerland	361
Refrigerator	storage, prechill (L,R)	Electrolux RF 70/14; -22° to +7°C.	Electrolux Svenska Forsaljnings Ab. Stortorget 17 S-211 22, Malmo Sweden	380
Refrigerator	storage (P)	Dayton 1 OHFO	Frigidaire Div. General Motors Corp. USA (widely available)	704
Refrigerator	storage, prechill (L)	KPS Type k-211, extra thermostat	K. Pettersen and Sonner Norway	425

Type	Use	Specifications	Manufacturer	User
Reach-in Units				
Refrigerator	storage, prechill (R,L)	Kelvinator Model 266	M/S Kelvinator of India, Ltd. 19-A Alipore Rd. Delhi-6 India	600
Refrigerator	storage	VYROBC 8999 420 kg capacity	Czechoslovakia	704
Refrigerator	storage (L,R)	- -	various models of local purchase	100, 151, 802
Freezer	storage (R)	Hitachi, Model RC8521 (0°); Model RC2402L (-20°C.)	Hitachi Electronics Co., Ltd., 23-2, Ichome Kanda-Sudacho Chiyoda-ku Tokyo, Japan	610
Freezer	storage (L,P,R)	Bosch GS 530, -25°C.	Robert Bosch AG Diesel u. Electric 8021 Zurich Switzerland	360
Freezer	storage (P,R)	Astor; temp. below 0°C.	Astor Italy	801
Freezer	long storage (L,P)	ITT Type HF-53	Standard Telefon-og Kabelfabrik Oslo, Norway	425
Freezer	storage (R)	two units, -20° and -2°C.	Sv. Fläktfabr. Ltd. Sweden	452
Freezer	storage (L)	Kelvinator Model 275	M/S Kelvinator of India, Ltd. 19-A Alipore Rd. Delhi-6, India	600
Freezer	storage	-10° to 0°C.	Commercial Cold Store Rogers, Brisbane Australia	802
Containers				
Drums	storage (R)	Leverpak Fiber Drums 61 cm diam, 61 or 91 cm tall	Continental Can Co. New York, NY USA	104
Drums	storage	30 liter polyethylene drums - "World Star"	Manser KG Skoln-Ehrenfeld 1 (RFA) France	320
Cans	storage (P)	36 x 23 x 23 cm; 10 kg capacity of Pinus or Picea	Metal Box Co. England	300
Plastic bags	storage (R)	Whirl-Pak	Nasco Ft. Atkinson, Wisc. 53538 USA	104
Tubes	storage (R)	coin tubes, Model 1005	Security Tubes Midwest Plastics, Inc. Wichita, KN, USA	105
Bottles	storage (P,L,R)	1/2 and 1 liter capacity, rubber ring seal; can vaccum-seal	Glashütte CH-8180, Bulach Switzerland	360

Type	Use	Specifications	Manufacturer	User
Containers				
Miscellaneous bags, bottles, cans	storage (P,L,R)	- -	various local retail sources	100, 362, 390, 704
Miscellaneous				
Shelving	support containers (P)	Dexion modular	Dexion G.M.B.H. 6312 Laubach Hessl, Dexion Strass, 1-5, West Germany (FDR)	801
Dehumidifier	removes moisture from storage room	Model No. 150	From Crown Agency	704
Plastic bag sealer	seals poly bags (P,L)	Impuls-Schweiss-press, Impress 400 DV, No. 613	Ampack AG Rorschach CH-9000 Rorschach, Switzerland	362

Type	Use	Specifications	Manufacturer	User
Jacobsen Type				
Copenhagen tanks	testing	220 V	Charles Hearson Co., Ltd. 172 Brown Hill Rd. Catford, London SE6 England	704
Copenhagen tank	testing	- -	Grant Instruments Ltd. Barrington, Cambridge England	620
Jacobsen tank	testing (L,R)	- -	Burchi and Tuci via A. Giannotti n.15 Florence, Italy	381
Jacobsen table	testing (L,R)	5 tables, modified from Løken (1968)	local	425
Copenhagen tank	testing (P,R)	300 x 55 cm (large) 60 x 51 cm (small)	local	300
Jacobsen system	testing (L,P,R)	- -	local	322, 370 581, 620
Jacobsen apparatus	testing (L,R)	15° to 50°C.; flourescent lights	local	380
Germination table	testing (L,R)	"Løken type" (see Løken, 1968)	local	452
Germination apparatus	testing	2 tables (see Løken, 1968; Alfjorden, 1973)	local	450
Germination tank	testing (L,R)	trays 12.5 cm wide; "Blue-M" water bath	local bath: Blue-M Electric Co. Blue Island, IL 60406 USA	152
Germination pans	testing (L,R)	similar to above, but 8 cm deep pans; all in contr. temp. room	local	152
Jacobsen germination	testing Abies, Cedrus (P)	Jacobsen cups, some UV light	local	322
Cabinet Germinators				
Electric	testing (R)	70 x 90 x 70 cm	Satoo Scientific Instr. Co., Ltd. Japan	610
Electric	testing (R)	70 x 90 x 150 cm	Kyoshin Sci. Instr. Co., Ltd. Bunkyo-ku Tokyo, Japan	610
Catalina	testing (R)	Isuzu Catalina SLV-12D, and Model SLV-4E	Isuzu Instr. Co., Itd. 3-8-19, Nishi-Ochiai, Shinjuku-ku, Tokyo, Japan	610
Conviron	testing (P,L,R)	Conviron G30; 4° to 40°C.; automatic, 8 trays	Controlled Environment 661 Madison Str. Winnipeg 21, Manitoba Canada	150, 152, 360, 154

Type	Use	Specifications	Manufacturer	User
Cabinet Germinators				
Seedburo	testing	- -	Cleland Mfg. Co. 2800 Washington Ave. Minneapolis, MN 55411, USA	100, 153 700
Pfeiffer	testing (L,P)	Daylight Germinator Model LC-DL with recording device	J. P. Pfeiffer & Son 1817 B Whithead Rd. Baltimore, MD 21207	106
Stults	testing (L,P)	Da-Lite, Junior Model	Stults Scientific Engineering Corp. 3313 S. 66 Freeway Springfield, IL 62703 USA	100, 106 600
Linder and May	testing (P)	0° to 40°C. (several models)	Lindner and May 243 Lutwyche Ave. Windsor Brisbane, Australia	801, 802
Steinmetz	testing (L,R)	modified Steinmetz cabinet	Steinmetz Apparatebau D-8 München 15 Postfach 103 West Germany (FDR)	381
Freas	testing (L,R)	Freas low temp. 815; -10° to 50°C	Precision Sci. Co. 3737 W. Cortland Str. Chicago, IL 60647 USA	380
Precision	testing (L,R)	"Precision" low temp. 31213; 5° to 50°C.	Precision Sci. Co. (see above)	380
Incubator	testing	Precision Incubator Model 805; 5° to 50°C.	Precision Sci. Co. (see above)	620
Bertagnin	testing (L,R)	Bertagnin 500, -10° to 50°C.; up to 90% rel. humidity	F. illi Bertagnin Bologna, Italy	322, 380
Low temp. cabinet	testing (L,R)	Automat Super-10	Scientific Equipment Works Nicholson Rd. Delhi, India	600
Germinator	testing	5° to 30°C.	Plastina Zone Industrielle Heillecourt-Est 54044-Nancy Cedex France	320
Grant automatic	testing	Use in room at least 2°C.	Grant Instruments Ltd. Barrington, Cambridge England	620
Rodewald	testing (P,L)	tub with sandy substrate, irrigated from below; 90 x 60 cm	Steinmetz Apparatebau D-8 Munchen 15 Postfach 103 West Germany (FDR)	362, 703
Lab-Line	testing (R)	temp. and light control	Lab-Line Instruments Melrose Park, IL 60160 USA	105
Labmaster	testing (P)	10° to 40°C.	? USA	802
Germinator	testing	QB-117/2	Labor Instrument Works 1450 Budapest, P.O. B. 33 Hungary	580

Type	Use	Specifications	Manufacturer	User
Cabinet Germinators				
Germinator	testing in sand (R)	(see Gustafsson and Simak, 1958)	local	450
Germinator	testing (L,R)	- -	local	321, 390, 600, 800
Incubator	testing (P,R)	large and small units for sand and TP tests	local	300
Germination Rooms				
Growth chamber	testing, seedling growth (L,R)	Conviron 7 D3A3	Controlled Environment 661 Madison Str. Winnipeg 21, Manitoba Canada	153
Phytotron	seedling growth (R)	6 rooms with different temperature regimes 6 rooms with different temperature, light, and humid regimes 1 room with different temperature regimes and different light quality	- local	610
Phytotron	testing (R)	8 rooms with different temperature and light regimes combined with 20 growth chambers	local	340
Walk-in	testing	- -	local	600
Thermogradient Plates				
Thermogradient plate	testing (R)	gradient 10° to 40°C.; surface 120 x 66 cm	local	300
Thermogradient apparatus	testing (R)	tests great range of temperature at one time	local	801
Thermogradient apparatus	testing (R)	2-way gradient; 10° to 40°C.; surface 76 x 76 cm	local	100

Seed Counters

Type	Use	Specifications	Manufacturer	User
Electronic Counters				
Syntron	seed counts (R,L,P)	I.C.A.L. Ref. y-12994	Syntron Division Int. Combustion Australia, Ltd., South Str. Rydalmers N.S.W. Australia	801
Syntron	seed counts (R,L,P)	Model EB-00 240V, 60 cy.	Syntron (see above)	800
Asco	seed counts (R)	Model 2080	Agr. Specialty Co., Inc. 11313 Frederick Ave. Beltsville, MD 20705 USA	100
Seed counter	seed counts (R)	Model GEP	Tripette et Renaud Paris, France	322, 340
Seed counter	seed counts (R)	QB-133	Labor Instrument Works 1450 Budapest, P.O. B. 33 Hungary	580
Seedburo	seed counts (R)	Count-A-Pak Model 88 (modified)	Seedburo Equipment Co. 618 W. Jackson Blvd. Chicago, IL 60606 USA	104
Seed counter	seed counts (L,R)	photoelectric	Audiotronics 37 Hopewell Ave. Ottawa, Ontario Canada	
Vacuum Counters				
Counter head	seed placement (R,P)	round, chromed heads, various sizes	G. L. Jacoby Lastmarkergaten 27B, Stockholm C Sweden	425, 801
Ames	seed counts, seed placement (R,L)	Ames Model 3, various heads	E. L. Erickson Prod. Brookings, S.D. 57006 USA	100, 106 153, 154
Vacuum counter	seed counts (R)	100-hole vacuum head	Lindner and May Brisbane, Australia	802
Pneumatic counter	seed counts (L,R)	Omega model	Polikeit Halle, East Germany (GDR)	581
Pneumatic counter	seed counts, seed placement (R,L)	QB-101/1	Labor Instrument Works 1450 Budapest, P.O. B. 33 Hungary	580
Vacuum counter	seed counts, seed placement (P,L,R)	modified household cleaner	Firma Max Müller Feinmech-Werkstätten CH-8910 Affoltern a. Albis Switzerland	360
Austen Vacuum Tweezers	seed placement (R)	Dymax MK1, various sizes (biased to empty seeds)	Charles Austen Pumps, Ltd. Petersham Works 100 Roysten Rd. ByFleet, Surrey England	300

Type	Use	Specifications	Manufacturer	User
Vacuum Counters				
Vacuum counter	seed counts (L,R)	- -	local	380
Vacuum counter	seed placement (L)	100 holes in head	local	322
Counting Boards				
Laboratory counters	seed counts (L)	Ser. No. 66660 A, 69996 (5 and 8 keys)	Clay Adams, Inc. New York USA	425
Counting boards	seed placement (R)	Erickson boards, Nos. 1, 2, & 5	E. L. Erickson Prod. Brookings, S.D. 57006 USA	100
Counting plates	seed counts (L,R)	- -	local	600
Sampling boards	seed counts (R)	made for *P. abies*, *P. sylvestris* (see Tifen, 1949)	local	450
Counting plates	seed counts (L)	100 holes per plate, 7 sizes	local	322
Other Devices				
Vibrating spoons	seed counts (L,R)	Mettler Vibro-Spatula LV 2 (4 models)	Mettler Instruments CH-8606 Greifensee Switzerland	425, 801

X-ray Equipment

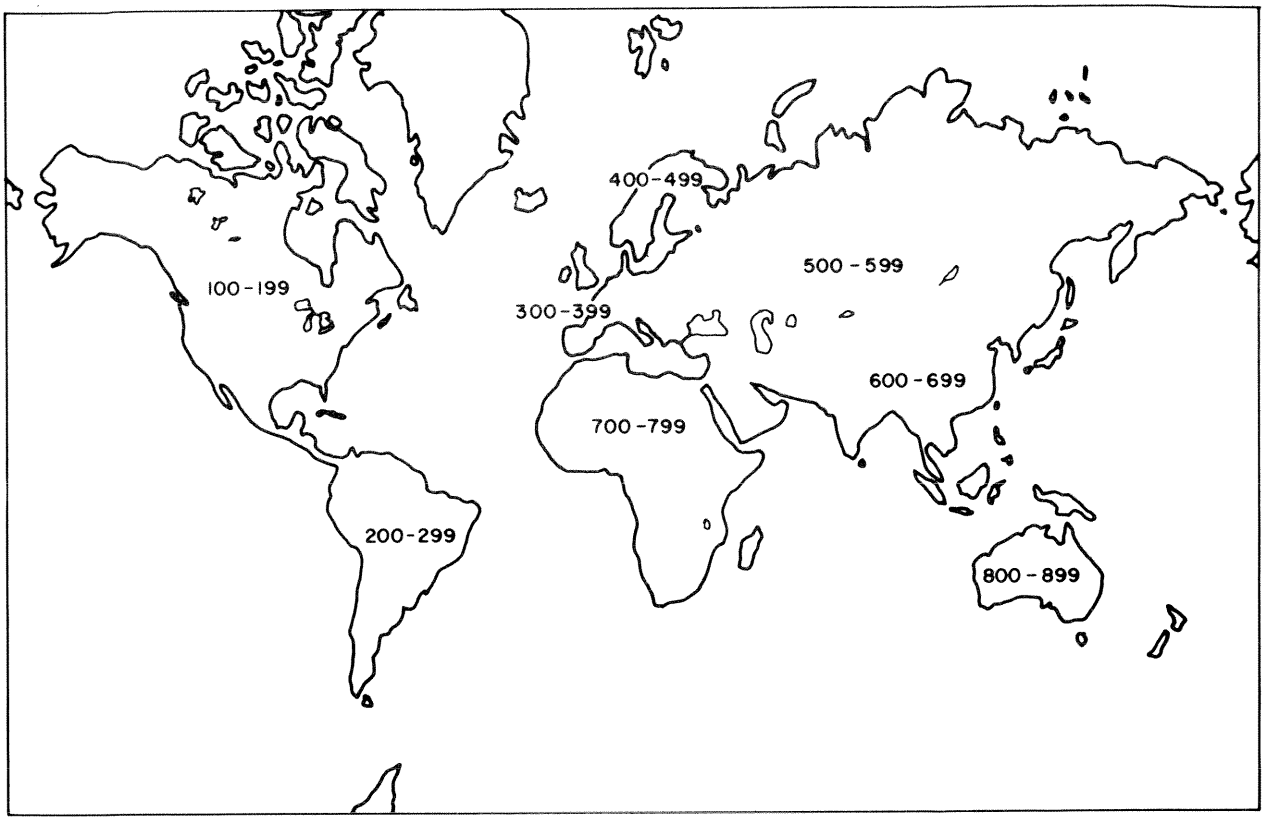
Type	Use	Specifications	Manufacturer	User
X-ray Generators				
Softex	check seeds from controlled crosses (R)	Type I.F.-0310 (K.M.-5M)	Softex Co., Ltd. 6, 7, 1-Chome, Shibuya Shibuya-ku, Tokyo, Japan	151
Softex	seed tests (R)	Model EMB	Softex Co., Ltd. (see above)	600, 701
Softex	seed tests (R)	Model EM	Softex Co., Ltd. (see above)	610
Faxitron	determine maturity, damage soundness (P,L,R)	Model 804	Hewlett-Packard McMinnville Division 500 Linke Street McMinnville, OR 97128 USA	100, 103 152
Faxitron	determine maturity, damage, soundness (P,L,R)	Model 805	Hewlett-Packard (see above)	106, 300, 801
Balteau	determine maturity soundness (L,R)	Baltograph BF 50/20	Balteau B-4610 Beyne-Heusay Belguim	360
G.E.	seed tests	LC-90 industrial machine; 40 kvp at 5 Ma	General Electric Co. 48855 Electric Ave. Milwaukee, WI 53219 USA	154
FKA	seed tests (R)	FKA	O Y Havemann, Ltd. 5-571 00 Nässjö Sweden	452
X-ray apparatus	seed tests	- -	local	320
Accessory Equipment				
Processor	develops Kodak paper prints (L,P)	Kodak Industrex Instant Proc. Model P-1	Eastman Kodak Co. Rochester, NY, 14650, USA	106
Print washer	preserves paper prints (L,P)	Richard 18 in. Model	Richard Manufacturing 5914 Noble Ave. Van Nuys, CA 91401 USA	106
Film holder	holds Polaroid film (P,L,R)	Polaroid 4 x 5 Land Film Holder No. 545	Polaroid Corp. 89 Second Ave. Waltham, MA, 02154, USA	152
Film reader	magnifier for radiograph viewing on screen (L,R)	Merkur 3-S	OCE-Ingut, Ltd. S-57100 Nässjö Sweden	452
Radiograph reader	radiograph viewing (R)	Wilnosol	Wilhelm Nosbüsch KG Birkenstrasse 71 4 Düsseldorf West Germany (FDR)	450
Helio contraster	radiograph viewing (R)	Model HLC-100E 4 x magn; 100 x 100 mm film size (see Kamra, 1974)	N. V. Optische Ind. Delft, Holland	450

Type	Use	Specifications	Manufacturer	User
Accessory Equipment				
Radiograph viewer	radiograph viewing (R)	- -	Picker Industrial 1020 London Rd. Cleveland, OH 44110 USA	100
Treatment frame	treatment with contrast agents (R)	treats and holds 25 seeds (see Simak, 1974)	local	450
Stereo-radioscope	stero-radiograph viewing (R)	(see Vozzo, 1974)	local	100
Template	transfer of seed from film to germination tray	(see Wang, 1974)	local	154

For other information on tree seed radiography, see: Wiersma, 1976.

Specialized and Miscellaneous Equipment

Type	Use	Specifications	Manufacturer	User
Seed pelleter	pellets *Eucalyptus* seeds (R)	reciprocating-rotating pan (see Millier & Bensin, 1974)	local	105
Automatic pipette	watering germination trays (R)	Exelo Double-Action Pipette	Gallenkamp P. O. Box 290 Technico House, Christopher Str. London E.C. 2, England	701
Freeze-drier	reduces seed moisture via freeze-drying (R,L)	Christ Delta I; 2 kg capacity; local modifications	Firma Martin Christ BRD-3360 Osterode am Harz West Germany (FDR)	360
Vitascope	viability tests (L)	based on tetrazolium staining	A/S Foss Electric 39 Roskiderej Hillerød, Denmark	104
Vacuum oven	viability tests	aid in tetrazolium stain tests; 10 to 110°C.	local	380
Fumigation cabinet	seed fumigation (P,R)	90 x 70 x 50 cm, W/exhaust fan	Centrioflo Pty., Ltd. Conditionaire House 2 A General Holmes Dr. Brighton-le-Sands, N.S.W. Australia	801
Temperature recorder	monitor temp. in germinators (L)	7-day chart, 3 sensors	Otakeiki Seisakusho Co., Ltd. 39-20, 2-Chome Narita-Higashi Suginami-ku Tokyo, Japan	801
Seed soaker	to fully imbibe seeds(L)	metal tray w/screen stand for seed; overhead spray nozzles	local	153
Seed grinder	catalase activity tests (R)	Ultra Turax grinder	Ika-Werk 7813 Stanfen Breisgau, West Germany (FDR)	350
Seed herbarium cabinet	store true samples (L)	- -	E. L. Erickson Prod. Brookings, SD 57006, USA	600



USER KEY — CONTRIBUTING LABORATORIES

100-199 North America

100-149 USA

100 - U.S. Forest Service
Southern Forest Experiment Station
Forest Tree Seed Laboratory
P. O. Box 906
Starkville, MS 39759

101 - U.S. Forest Service
Rocky Mountain Forest Experiment Station
Forestry Sciences Laboratory, NAV
Flagstaff, AZ 86001

102 - U.S. Forest Service
Rocky Mountain Forest Experiment Station
Forestry Sciences Laboratory
East Campus, Univ. Nebraska
Lincoln, NB 68503

103 - U.S. Forest Service
North Central Forest Experiment Station
Bedford, IN 47421

104 - International Paper Co.
Southern Kraft Division
Southlands Experiment Forest
Bainbridge, GA 31717

105 - U.S. Forest Service
Southeastern Forest Experiment Station
P. O. Box 938
Lehigh Acres, FL 33936

106 - Pennsylvania Bureau of Forestry
Mont Alto Nursery
Mont Alto, PA 17237

150-199 Canada

150 - Department of Forest Resources
University of New Brunswick
Fredericton, N.B.
E3B 5A3

151 - Forest Tree Seed Laboratory
British Columbia Forest Service
Research Division
Victoria, British Columbia
V8V 1 x 5

152 - Pacific Forest Research Center
Canadian Forestry Service
506 West Burnside Road
Victoria, B.C.
V8Z 1M5

153 - PFRA Tree Nursery
Indian Head, Saskatchewan
SOG 2K0

154 - Petawawa Forest Experiment Station
Canadian Forestry Service
Chalk River, Ontario
K0J 1J0

200-299 Central and South America

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390-399 Other

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