

LADDERS AS AN AID TO SEED COLLECTION

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I Introduction

The purpose of this outline is to describe ladders which can be used to simplify seed collection work. Not all of the ladders and devices described have been tested by the Tree Seed Plant, but each type embodies ideas which may be useful to others who are obliged to climb trees.

II Ground Ladders

a. Short Ladders

Table 1 compares the properties of the single section ladder, the tripod ladder and the folding type ladder. Of these the single section magnesium ladder with flat corrugated rungs is the best for general use.

b. Long Ladders and Attachments

1. Double Extension Ladders

The various types of double extension ladder are compared in table 2. Since the Magnesium extension ladder is just appearing on the Canadian market, and since an Aluminum extension ladder weighs approximately the same as a wooden extension ladder, of the same length, it would seem, that for strength required, and ease of handling, the wooden ladder is the best suited for seed collection purposes.

Stand-Off Tube Assembly

This gadget was designed at Angus for the purpose of holding the top of a double extension ladder, 5 ft. away from the stem of the tree. This would put the ladder in an almost vertical position and enable the cone picker to reach the outer branches of red pine and tamarack.

A 5 ft. long arm is fastened to the tree, by means of a chain and toothed saddle, and to the top of the ladder, by means of a coupling and a lock pin. The procedure is to put the ladder up against the stem of the tree, climb to the top of the ladder, fasten the saddle to the trunk of the tree and push the ladder away from the tree with the shaft of the stand-off tube in the coupling, and then lock the shaft by means of a pin through the coupling.

The stand-off tube assembly is being made by Lintet Metal Ind. Ltd., Renfrew, Ont., for \$24.00 (Can.).

Table 1. - Comparison of Short Ladders

Type of Ladder	Total Length	Material	Weight	Safety Devices	Cost	Manufacturer
Single Section	6'-20'	Magnesium	1 lb/ft to 12 ft. 11 " over 12 ft.	Flat or round corrugated rungs (flat 25¢ extra)	\$13.30 for 6 ft. \$41,60 for 20 ft.	Lintet (1)
	6'-20'	Aluminum	1 lb/ft to 16 ft. 1N " over 16 ft.	Tilting rubber feet or steel pointed feet \$8.95 & \$4.50	\$11.40 for 6 ft. \$46.20 for 20 ft.	Featherlite (2)
Tripod Orchard	8'-14'	Magnesium	1N lbs/ft.	Flat or round corrugated rungs	Platform top \$33.00 for 8 ft. \$44.00 for 12 ft. Pointed top \$30.90 for 8 ft. \$45.90 for 14 ft.	Lintet (1)
Folding		Aluminum	10° weighs 18 lbs.	Rubber tilting shoes included	\$41.00 for 6 ft.	Duo-Safety
	6'-20' 10'	Aluminum			\$83.00 for 20 ft. \$43.85 for 10 ft.	(3) Aluminum Ladder Co. (4)

Table 2. - Comparison of Double Extension Ladders

Type of Ladder	Total Length	Material	Weight	Advantages or Disadvantages	Cost	Manufacturer
Double Extension	289'-42'	Douglas Fir	40' weighs 92 lbs.	Wood Splinters	\$0.85 per ft. (Can.)	
	16'-40'	Aluminum	40° weighs 94 lbs.	Cold on Hands Heavy for size Ridged sides makes carrying difficult	\$4.50/ft. (Can.)	Safety-Supply Co. (3)
	20'-36'	Magnesium		Cold on hands	\$3.00/ft. (Can.)	Lintet (1)

1. Lintet Metal Industries Ltd. - Box 877, Renfrew, Ont.
2. Featherlite Products, 26 Bolton St., Ottawa, Ont.
3. Duo-Safety Ladder Corporation, 809 Ninth St., Oshkosh, Wisconsin
Agent - Safety Supply Co., 21 Dundas St.E., Toronto, Ontario
4. Aluminum Ladder Co., Worthinrton, Pennsylvania

Anderson Hydralizer

The hydralizer is a device which can be attached to the base of any ladder, to give it a firm footing on rough or uneven terrain. An hydraulic arrangement allows up to an 8" difference in height between legs, and the feet are supplied with rubber pads and steel teeth to prevent slipping.

The hydralizer is manufactured by the Anderson Products Co., P. G. Box 691, Tulare, Calif., at a cost of \$25.75 (Can.)

2. Multi-section Ladder

Sectional Tree Ladder, Double Stem

This ladder was built for the Forest Expt. Station, Chalk River, Ont., it is made of magnesium and designed for vertical use. Six sections are employed and the full height is **531 6**. The sections are all of the same width (10, Y inside) and are joined by tapered lugs and sockets. The tapered lug is held in by a removable pin. The bottom section has soft soil shoes and pins, and at the upper end of each section there is a saddle to hold the ladder approximately 10" from the tree. Each saddle is equipped with a spring loaded chain which holds the ladder tightly to the tree. The ladder is erected as follows: The first three sections are assembled and walked up to the tree. The ladder is then held while the three chains are fastened; additional sections are added by climbing, inserting the lugs and pins and then chaining. The sections weigh approximately 13 lbs. each and are easily handled.

This ladder is available on a delivery schedule of approximately 5 weeks and is priced at \$375.00 (Can.) Sales Tax Extra, Lintet Metal Industries, Renfrew, Ontario.

Swedish Single Stem Ladder

This all steel ladder is used for tree breeding and seed collection in Sweden. It is designed for trees which do not have any limbs close to the ground and has a total height of 58' 4". The seven sections are joined by means of an outer sleeve at the base of each section and a locking pin. A saddle at the top of each section keeps the ladder 5" from the tree and a leather belt fastens the ladder securely to the tree. Climbing rungs are spaced 11 ft. apart on alternate sides of the stem, about every 4i. ft. rungs are placed on both sides of the stem.

A plan for this ladder is on file at the Tree Seed Plant, Angus, Ont. The ladder is made by A. B. didstrand & Berg., Mora, Sweden, for about \$100.00 (U.S.). Details of its construction were submitted by Dr. Helge Johnsson, Foreningen For Vaxtforadling Av Skotstrad, Ekebo, Kallstorp, Sweden.

III Truck Mounted Ladders

Extension Truck Ladder-Swivelling

This style of ladder is still under development. One is being built for the Dominion Forest Service at Indian Head, Sask., and is nearing completion. This unit is designed for installation on a truck and consists of three trussed sections telescoping together and mounted on a swivelling base. The upper end has a platform and safety rail and is intended to carry two men. This ladder

has a maximum length extended of 431 and telescopes to approximately 28'. The ladder is elevated and extended by geared winches. The ladder weighs approximately 145 lbs. and base about 400 lbs. These ladders are available as custom built jobs only, and are individually priced upon receipt of specifications by Lintet Metal Industries, Renfrew, Ont.

Extension Truck Ladder-Non-Swivelling

These are extension ladders up to 36 ft. designed for mounting on 1/2 or 3/4 ton trucks. The ladder is attached near the rear of the box and is braced by tubes and cables. The ladder when erected is at an angle of 15 from vertical, this style of ladder is sold at \$300.00 for a 28' model (2 sections 14' long with a maximum extended length of 25',) Lintet Metal Industries, Ltd., Renfrew, Ont.

IV Collection Without the Use of Ladders

An idea tried in Sweden should be investigated, it is to shoot an arrow carrying a fine line, over the limb of a tree, and use this line to get a rope over the limb. By attaching one end of the rope to a power winch on a truck and the other to a man, he can be hoisted into the tree.

Once in the tree it is possible to pick from the top down by means of a rope. The rope is looped around the stem at a branch, one end is allowed to fall free down to the ground, the other is made into a seat by means of a special knot leaving the end free to be tied by a sliding hitch to the part of the rope going to the ground. This enables the picker to go out to the branch ends and down the tree with complete safety and to control his descent, right to the ground, by means of the sliding hitch. He can cover about one-third of the crown surface. An improvement could be made by having a leather harness for the seed picker which is attached by means of a clasp to the rope.

V Summary

General field collection of coniferous and hardwood seed can be accomplished with the short, single section magnesium ladder, and the long double extension wood ladder. The double extension ladder can be made more useful and safer by using the stand-off tube assembly and the Anderson hydralizer.

The collection of seed from elite trees often requires the use of a vertical ladder; in this field, preference is given to the magnesium double stem type.

Seed collection along roads, from windbreaks and eventually from seed orchards will be simplified by the use of truck mounted ladders, of which the type having a swivelling base would be desirable.

The development of a harness for use with a rope, to support the seed picker anywhere in the tree has several advantages. It can be used anywhere and would be particularly valuable in places where it is difficult to carry a ladder. Assuming you can get into the tree, the rest of the job is very easy.

Briefly, the ease and effectiveness of seed collection work, depends largely on having proper equipment, and ladders form a major item of this equipment.