

## MISCELLANEOUS MECHANICAL DEVELOPMENTS

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First, I wish to thank the many contributors of information and slides depicting equipment developments in nursery and tree improvement work. The response to my S O S was so good that I will be unable to include all information and slides in my presentation. Perhaps additional slides can be shown during LeRoy Jones' slide session tomorrow afternoon.

In my presentation, I realize that items of equipment are closely tied in with other subject matter on the program. It is not my intention to get into nursery and tree improvement practices which will be discussed later, and if the depicting of equipment detracts from your part of the program, please accept my apologies now,

## EQUIPMENT FOR SOIL FUMIGATION

From the 1-pound can of methyl bromide and the 4-mil tarp, we have come a long way. First were pressurized injection systems alone; and then pressurized injection incorporated with tarp-laying rigs. To eliminate alternate strip fumigation, developments have been made in gluing systems that give us continuous field fumigation. With a great deal of work by many people, these systems have evolved. The dribble system of glue application is the oldest, but is still in use. Now pressurized, this system uses three 1/8-inch tube outlets to facilitate the spread of the glue.

A spray-on glue dispensing system was developed in 1968. An air compressor providing 10 c.f.m. is used for atomization of the glue. The glue is dispensed with a pneumatically operated spray gun, A pneumatic valve mounted near the tractor operator permits instantaneous control of the glue flow.

Since 1968, the extrusion equipment for glue application has been developed. This system consists of a CO<sub>2</sub> pressurized tank of glue, air pressure regulator, ball cutoff valve, and a 2-inch glue heading tip which gives 10 beads of glue approximately .04-inch in diameter. The glue is applied to the polyethylene while it is being unrolled. The extrusion system of gluing was developed at North Carolina State University by Walter Skroch and Tommy Monaco of the Horticulture Department. Existing cover-laying rigs can be converted to the extrusion system. At least one manufacturer, Reddick Equipment Company, Williamston, North Carolina, expects to have production models of this rig available for sale by the fall of 1970.

## SEED ORCHARD POLLINATION AND SEED COLLECTION EQUIPMENT

As we developed our seed orchards, the need for equipment for seed pollination and seed collection soon became apparent. First, we used ladders; then taller ladders; ladders mounted on tractors or trucks; then we built platforms on pickups; taller platforms on larger trucks; even taller platforms; and cherry pickers.

In collecting slash pine and longleaf pine cones, we use tree shakers. Some of us have tried collection frames under the trees, or nets to catch the seed, even nets over the trees, and seed catchers.

Tree shakers do not work satisfactorily on loblolly pine and some other species. And, the trees continue to grow beyond the logical reach of ladders and platforms. The North Carolina State Tree Improvement Program, in trying to develop the best means of collecting loblolly pine seed, has developed a vacuum pickup machine for seed orchards. First, a prototype was developed which showed merit; then the first production model was built and put in

use in 1969. There are some "bugs" in the machine that must be worked out, but the machine does work. In fact, I understand that the biggest "bug" is a matter of how to separate seed and trash picked up by the machine. I am sure that more work will be done with this machine in 1970 and many problems solved. To date, roughness of terrain has not been near the problem anticipated and, needless to say, the cleaner the area at the time of seed-fall, the better the job done by vacuum pick up.

#### HANDLING COTTONWOOD CUTTINGS

The State of Mississippi furnished information on handling cottonwood switches. Formerly, the cottonwood switches were cut by hand and the switches were cut into suitable length cuttings by hand.

Mississippi has developed a tractor-mounted blade that cuts the cottonwood switches at about groundline. These switches are harvested and transported in tree lengths to a gang-type saw where they are cut into lengths for packing and shipping. These are certain to be money saving developments in cottonwood production.

#### SEEDING EQUIPMENT

Several seeders are on the market that are new to me. Weyerhaeuser Company used a Stanhay Seeder this year in its North Carolina nursery. This drill is manufactured in England and features a belt feed. Hole sizes and spacings in the belt are used to determine the number of seeds planted. The drill can be used for large and small well-cleaned seed. Each drill of the Stanhay Seeder has an individual seed hopper. The hoppers and other parts of the machine are rigged electronically, and if the hopper is low, a light indicator informs the tractor operator. I have one of the Stanhay drills with me and you may inspect it during the break if you desire.

The Seeder is used in New York State. This seeder features a double hopper which bands phosphorus alongside the drill sown seed. This drill was modified by Bud Terrell. Sid Hanks can give us more information on this equipment.

In connection with their hydro-mulch operation, Continental Can Company has mounted a Whitfield Seeder on the front-end tractor frame. This modification permits seeding and mulching in one operation.

#### OTHER MISCELLANEOUS EQUIPMENT DEVELOPMENTS

New York State is using a spray rig with hydraulic boom that covers 60 feet. This is one possibility that we have been considering in North Carolina. I am glad that Bud Terrell has the experience from which we can all learn.

New York State also uses large crates and a fork lift in transporting seedlings from the field.

Union Camp Corporation has developed a front mounted basal sprayer for herbicides, Shields are provided to prevent drift onto the seedlings. John Hamner is using Paraquat and other herbicides between the drills. This sprayer is similar to the North Carolina rig used to spray seedling stems with DDT for pales weevil control in field plantings before lifting the seedling.

Many different models of riding weeders have been, or are being, developed, Union Camp Corporation uses a homemade self-propelled type. Weyerhaeuser Company has recently purchased a basic unit powered by a small gasoline engine from the Holland Transplanter Company. The unit has good features.

John Hamner writes that the wooden boxes used for lifting seedlings cost about the same as metal tubs but last three to four times as long. This has been my experience in North Carolina. We purchase our boxes from Miller Manufacturing Company, Richmond, Virginia.

Metal frame seedling handling equipment is needed by many of us. Several nurseries are using this type of equipment, Sid Hanks can furnish us with names and addresses of those who have developed these rigs, both with casters and for fork lift use.

A simple root-pruning device has been developed using one-third sections of a 16-inch rolling coulter,

For seed treating and mixing, most of us are using small concrete mixers. John Hamner uses the concrete mixer; Ted Sweetland of Continental Can Company has developed a homemade rig using a 55-gallon drum.

There are many miscellaneous equipment developments in nursery and seed orchard operations; I have been unable to cover them all. I am keeping the literature furnished by those who assisted me and will be glad to pass on any information on these items. Please feel free to contact me at the meeting, or write to me, if you wish names, addresses, etc., of users, developers, or manufacturers of the various types of equipment discussed.