

New Applicators for Weed Control in Forest
Nurseries and Plantations

J. M. Chandler and T. H. Filer

Agronomist, Southern Weed Science Laboratory
USDA-SEA-AR, and Plant Pathologist, Southern
Hardwood Laboratory, USDA-FS, Stoneville, MS.

Until recently chemical weed control technology in forestry nurseries was limited primarily to soil fumigation, a very expensive and laborous weed control procedure. Herbicides for preemergence application have been registered and are currently being used to control many annual weeds. Removal of perennial weeds such as nut-sedge, (Cyperus spp.) bermudagrass [Cynodon dactylon (L) Pers.] and johnsongrass [Sorghum halepense (L) Pers.] is still accomplished by hand labor which is very expensive and increasingly difficult to obtain. Our objective was to evaluate and/or develop equipment to apply non-selective herbicides selectively in forest nursery stock.

The Stoneville Wiper was developed in 1978 to make post-emergence band applications of non-selective herbicides in various row crops from the cotyledon stage through layby (Figure 1). The Stoneville Wiper was utilized in 1979 to treat a very dense stand of broadleaf signalgrass [Brachiaria platyphylla (Griseb.) Nash], large crabgrass [Digitaria sanguinalis (L.) Scop.], and goosegrass [Eleusine indica (L.) Gaertn.] in black walnut (Juglans nigra L.) seedling beds at Baucum Nursery, Little Rock, Arkansas. Glyphosate at 3 lb/A applied with the Stoneville Wiper without the carpet to grass 28 to 36 inches tall in mid August resulted in 70% control 30 days after application. Grass control of 90% was obtained when the grass was only 4 to 10 inches tall. Blackwalnut seedling injury was limited to leaflets that were pulled under the applicator. In late August hand weeding data indicated that \$1350 per acre would be required to clean the beds. The cost per acre for the glyphosate treatment was approximately \$30 per acre.

During 1980 the Stoneville Wiper was utilized with and without the carpet in a cottonwood (Populus deltoides Marsh.) nursery (Figure 2). Glyphosate application at 1 to 3 lb/A was made to winter annuals. The lower rate did not provide adequate control. A hooded sprayer that covers an area 40 inches wide was built to apply herbicides to the middles between the cottonwood trees in mid summer (Figures 3 and 4). This applicator consist of a fiberglass hood 40 inches by 12 inches and 9 inches tall with nozzles mounted in the top 8 inches apart. Glyphosate at 2 lb/A gave 90 to 100% control of all vegetation present which included johnsongrass.

The "Two-in-One" applicator was designed and developed to treat a 4-inch band between pine (*Pinus* spp.) seedlings planted in rows 8 inches apart on a four foot bed (Figure 5). Individual applicator units, attached to an oiling bar arm, consist of an enclosed PVC pipe hood, a spray nozzle, and a 4 inch by 14 inch piece of nylon carpet with 3/4 inch fibers (Figure 6). The cone spray nozzle, mounted into the top-front portion of the PVC hood, delivers herbicide solution onto the back of the carpet that is attached face down over the lower part of the unit. When the carpet is removed, the herbicide can be sprayed directly onto the weeds. Preliminary work at W. W. Ashe Nursery, Brooklyn, Mississippi shows the unit has potential utility in the control of bermudagrass and nutsedge. No injury was observed on the pine seedlings.

In nursery situations where the weeds are taller than the nursery stock a newly developed applicator called the Ultimate Stoneville Applicator is being evaluated.

Editor's note: Plans of the Stoneville Wiper are available from: USDA Forest Service, State and Private Forestry, Rm. 300, 1720 Peachtree Road, N.W., Atlanta, Georgia 30367.

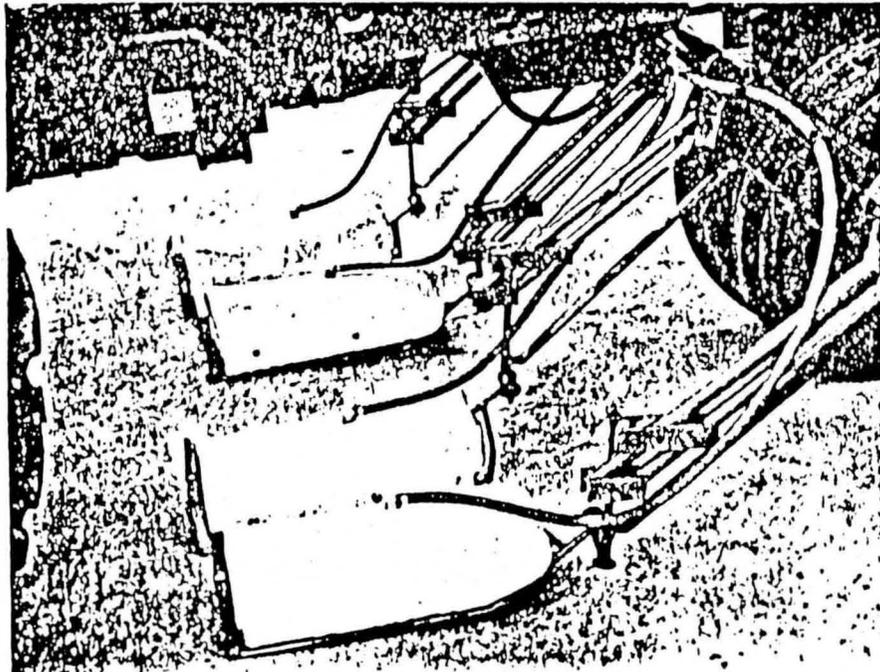


Figure 1. Stoneville Wiper mounted under front of tractor.

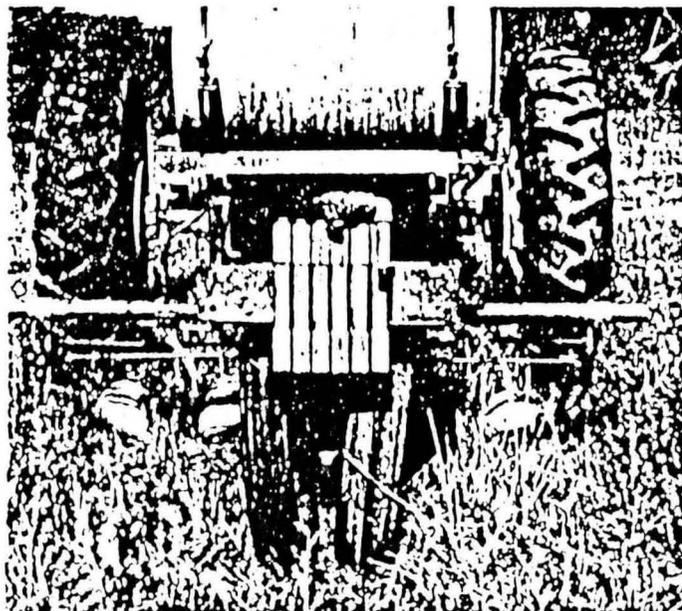


Figure 2. Stoneville Wiper applying herbicide in cottonwood reproduction nursery.

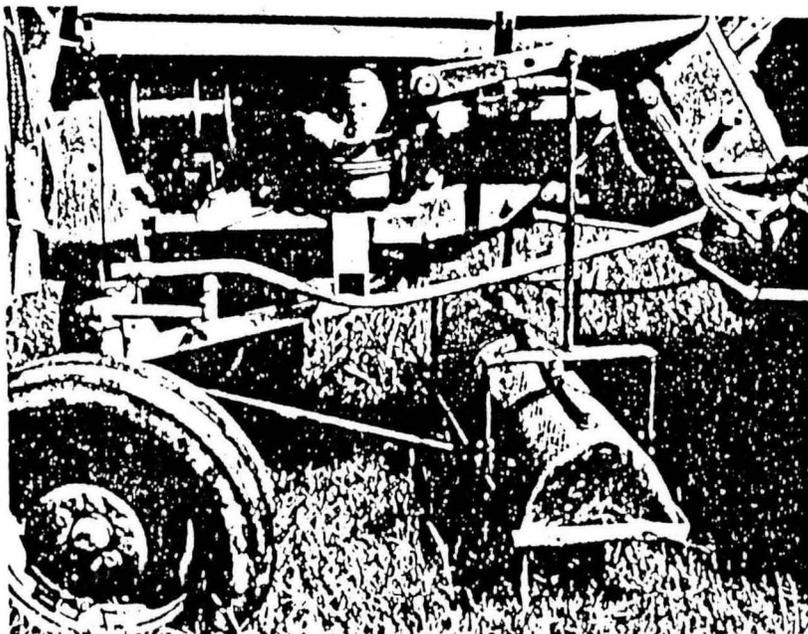


Figure 3. Hooded Sprayer mounted under front of tractor.

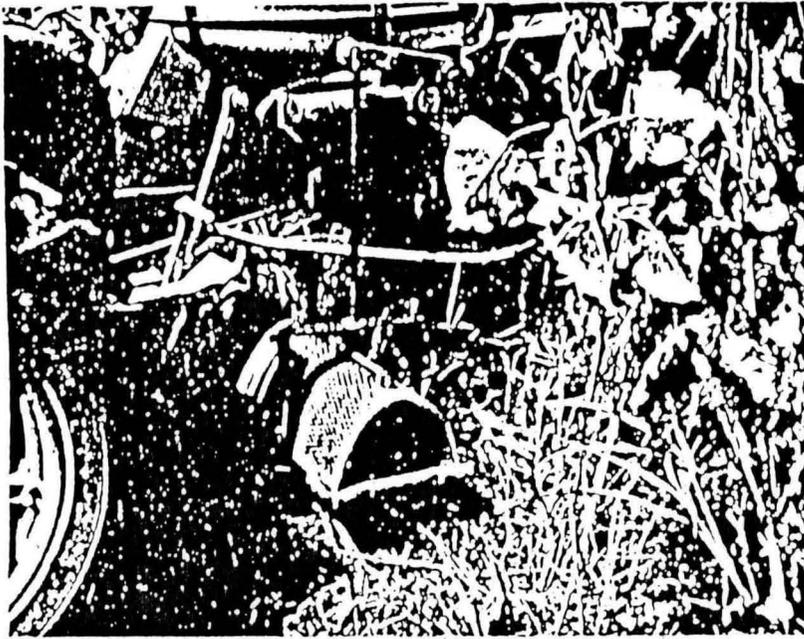


Figure 4. Hooded Sprayer applying herbicide between rows in a cottonwood plantation.

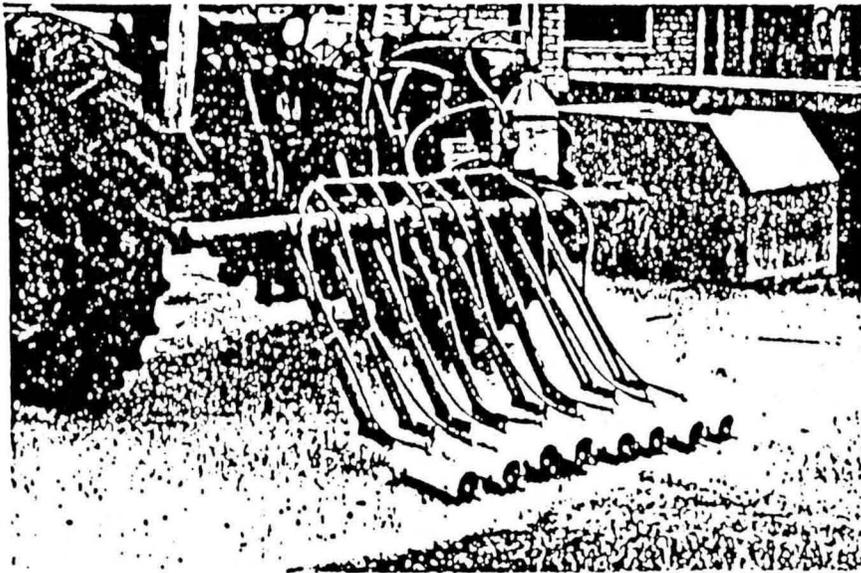


Figure 5. Two-in-One Applicator mounted on rear of tractor.



Figure 6. Two-in-One Applicator applying herbicide to bermudagrass in a pine seedling nursery bed.