instance. This treatment, therefore, offered no advantage.

Dipping significantly reduced the effect of planting shock on seedlings planted on the moist and dry sites. On both sites, dipped seedlings began growing sooner than the sprayed or control seedlings. On the dry site, early growth of dipped seedlings was related to their significantly higher rate of survival over that of the controls after 1 year. Height differences, by treatment, were not significant after 1 year on either the moist or dry sites. Seedling survival in all treatments was negligible on the very dry site.

Dipping seedlings in All-Safe aided early seedling establishment and survival, but there were not enough other benefits to recommend that this transpiration retardant be used as a standard procedure. Further study is needed to determine if survival and early growth of seedlings can be increased.

MODIFIED PORTABLE VACUUM SPEEDS UP CLEANING OF SEED DRILL HOPPERS

PAUL RIEKKI, JR., *Farm equipment operator*
James W. Toumey Nursery
Ottawa National Forest
Forest Service USDA

Seed drill hoppers have to be cleaned between seed lots. Sometimes, more seed may be put into the hoppers than is necessary to sow the beds. If an appreciable amount of seed is left at the end of a run, removing the seed from the hoppers is easier than running it through the spouts into containers.

At the James W. Tourney Nursery, Watersmeet, Mich., seed drill hoppers are cleaned with a small auto hand vacuum cleaner fixed with a homemade cone-shaped extension tube attachment (fig. 1). The $9.95 hand vacuum plugs into the cigarette lighter of the tractor. Tree seed is sucked from the hoppers, while the seed drill is stopped on the seedbed between lots or at the end of a run.

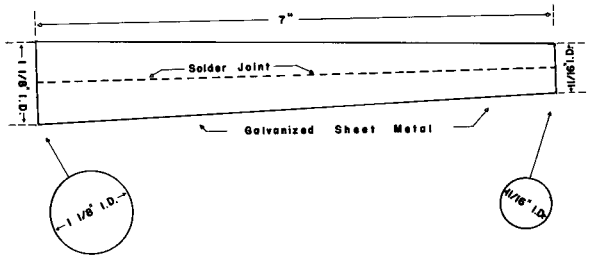

Figure 1.—Homemade cone-shaped extension tube attachment for use with auto hand vacuum cleaner.

FOREST PEST LEAFLET

Recently revised issues of a number of Forest Pest Leaflets are available free from Forest Experiment Stations and Forest Pest Control Zone offices. Recent revisions include the following:

FPL-2 Mountain Pine Beetle
FPL-5 Douglas-Fir Beetle
FPL-7 Jack Pine Budworm
FPL-24 California Flat-Headed Borer
FPL-26 Fusiform Rust of Southern Pines
FPL-27 Southern Conerust
FPL-45 Black-Headed Budworm
FPL-47 Sitka Spruce Weevil
FPL-56 Monterey Pine Ips
FPL-59 European Pine Shoot Moth
FPL-64 Carpenterworm
FPL-75 Beech Bark Disease
FPL-79 Sweet Fern Rust in Hard Pines
FPL-85 Walnut Anthracnose
FPL-118 Balsam Woolly Aphid