CLAY SPRAYS

Chuck Gramling, USDA Forest Service

Abstract

A root treatment of clay slurry mixture to pine seedlings at the time of packing is done to keep the seedling roots wet. Keywords: Water, Clay, Fungicide.

INTRODUCTION

The purpose of this paper is to discuss clay slurry mixtures and application methods used at the USFS Ashe Nursery. The primary purpose of slurry is to keep seedling roots wet. Fungicides may also be used in the slurry to control pathogens. All seedlings are field packed in this operation.

SLURRY MIXTURES

Three slurry mixtures are used at the nursery. The basic mixture is a kaolin clay and water mixture, usually prepared with 100 gallons of water and 150 pounds of clay. This mixture serves to keep seedling roots wet, and is used to reduce root exposure when the packaged seedlings are outplanted. The addition of clay to the water makes a viscous liquid that will adhere to the roots better than water alone. Benomyl (Benlate 50wp) is added to the slurry at two rates. One rate is used to control brownspot on longleaf when outplanted, and another rate which is used to control Fusarium and Rhizoctonia on loblolly and slash pine seedlings. Benlate is labeled for brown spot control on longleaf pine when applied at a rate of 1 lb of benlate per 9.5 pounds of kaolin clay in the slurry. This rate may be approximated by mixing 15 pounds of Benlate 50 WP product with 100 gallons of the afore mentioned basic clay slurry. Benlate is labeled for use on loblolly and slash pine seedlings to control other fungi at a lower rate than used on longleaf pine for brownspot control. A mixture of the benlate slurry for loblolly pine can be obtained by mixing 5 pounds of benlate fungicide with 100 gallons of basic clay slurry (Note: The label specifies 2 pounds of Benlate 50 WP per 50 pounds of clay, so up to 6 pounds of Benlate per 100 gallons of the afore mentioned basic slurry would be consistent with the label rate.). If the amount of clay in the basic slurry is varied, then the amount of benlate should be varied proportionally.

HANDLING AND MIXING

Seedlings are packaged in the field on "packing wagons", which have 100 gallon reservoir tanks to hold the slurry. A hydromulch machine is used to fill the packing wagon tanks at the lifting site. For ease and safety in dumping the 50 pound bags of kaolin clay, the basic clay slurry is mixed in a

400 gallon floor level mixing vat at the packing shed and pumped into the hydro **mulch machine** through a 2 inch flexible hose. Benlate, when used, is added into the slurry at the packing wagon. Slurry is pumped into a small bucket, and the benlate is premixed with the liquid before it is put in the slurry tank on the packing wagon.

A diaphragm type pto pump is used to circulate the slurry on the packing wagon. The plumbing is set up like a typical agricultural spray rig. The pump forces the slurry to a pressure regulator valve. Two lines exit the regulator valve. One line serves as a pressure relief line back into the tank and keeps the slurry mixed. The other line goes to the packing area and has a garden hose nozzle on it for spraying slurry on the seedlings.

A few observations have been made over several years of using the set up. Roller and piston pumps have not held up to the abrasive wear of the slurry. The most common problem with the pumping system is trash clogging the regulator valve and hampering the diaphragm pump. It is helpful to mount a garden hose fitting near the regulator for quick flushing of the regulator, and the regulator should be flushed with water daily. Trash may also be a problem in garden hose nozzles. Care must be taken not to let the slurry system freeze in cold weather. If air gets into the return line to the tank, and benlate is in the slurry, then the slurry will become foamy and can not be pumped.

SLURRY APPLICATION

The seedlings are handlifted from the nursery beds, and placed on the conveyor on the packing wagon (the packing wagon is a trailer from a Grayco seedling harvester modified for packaging seedlings). At the end of the conveyor seedlings are accumulated in convienent size bundles for spraying (approximately 25-70 seedlings depending on size and species). The seedling roots are sprayed with slurry just before or after they are placed in the seedling bags. The nursery's lifting contract specifications require that no more than one minute may elapse from the time a seedling is lifted until it is placed in a seedling bag with its roots coated with slurry. In 1988, when 8-10 laborers lifted seedlings for each packing station, root exposure normally ranged from 10 to 30 seconds from lifting through packaging. Spraying the seedlings with a garden hose nozzle does not provide as complete coverage as dipping the roots in a vat of slurry. Therefore, it is critical to reduce the size of the bundle to be sprayed so that roots are completely coated. This gives better protection when the ground becomes dry.

Taking care of seedling roots is critical to seedling survival. Keeping the roots wet with water is a must for success in reforestation. In the words of a wise and well known owl:

GIVE A HOOT
AND
DON'T POLLUTE
AND
PROTECT YOUR ROOT!