CHLOROPICRIN WITH METHAM-SODIUM AND EPTAM FOR NUTSEDGE CONTROL AND THE PRODUCTION OF SOUTHERN PINE SEEDLINGS

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In 1996, 1.2 billion bare-root pine seedlings were produced throughout the southern United States. These were used to establish 1.8 million acres of forest plantations or about 76% of the nations total (Moulton and Snellgrove 1997). Although mechanization and judicious pesticide usage has kept per seedlings prices at about 3.5 cents each, one nursery acre produces about $25,000 worth of seedlings. Soil fumigation with methyl bromide (MBr) has been used since the 1960's to control previously destructive soil-born diseases and to reduce weeds.

The Auburn University Southern Forest Nursery Management Cooperative began evaluating alternative fumigants for pine seedling production in 1993. In the South, chloropicrin alone has often enhanced pine seedling growth about as well as when combined with MBr (South *et al* 1997). However, some weeds and especially yellow and purple nutsedges became abundant in the first or second crop after fumigation. At least in the short term, (trials of one or two years) adding metham-sodium or 1-3, dichloropropene to chloropicrin increased nutsedge control to levels similar to that of treatments containing MBr (Carey, 1994). Based partly on the regulatory history of 1-3, dichloropropene, combinations of chloropicrin and metham-sodium now seem to be our best options for replacing treatments containing MBr.

Chloropicrin (300 lbs/ac) alone and in combination with metham-sodium (670 lbs/ac), and with Eptam (6 lb ai/ac) were compared for effects on loblolly (*Pinus taeda*) and slash (*P. elliottii*) pine seedling growth and for reductions in nutsedges at a nursery in Macon County Georgia in 1997 and at nurseries in Tattnal County Georgia and Beauregard County Louisiana in 1998. At each nursery, the management's regular post emergent applications of Goal kept seedling beds largely free of annual grasses.

In 1997, chloropicrin alone did not increase numbers or sizes of pine seedlings compared to controls but when combined with metham-sodium or Eptam, more and larger seedlings were produced. Nutsedge tubers were collected at harvest. Surprisingly, chloropicrin alone drastically reduced numbers of tubers compared to controls (from 12/ft^2 to 1/ft^2) and adding metham-sodium or Eptam did not further reduce numbers of tubers.

In 1998, few nutsedges had developed in the Tattnal County plots before July. In Louisiana, whole plots were hand weeded in late July. Weeds were air-dried one week before

weighing. Weights of nutsedges were similar among fumigation treatments (chloropicrin alone, with metham-sodium, and with Eptam averaged, respectively, 35.4, 10.5 and 2.0 lbs/ac) all of which contained less than not fumigated plots which averaged 485 lbs/ac.

As of June 1998, Louisiana plots fumigated with chloropicrin alone or with chloropicrin plus metham-sodium but not those fumigated with chloropicrin plus Eptam contained more seedlings than control plots. In Georgia, differences between seed bed densities were not significant. Data for any differences between fumigation treatments for seedling size will be presented in December.

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