

Geotech Application at  
Indian Mound Nursery

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Abstract.--The first trials using Geotech<sup>2</sup> as a mulch replacement for loblolly pine seedbeds were started at Indian Mound Nursery in spring, 1987. The Geotech was applied using no mulch and also applied to other beds under the mulch. Life history plots were established to determine differences in germination and survival of the seedlings due to the Geotech. While no differences were detected for Geotech applied before mulching, germination, survival and growth decreased when the Geotech was used alone. Geotech was again applied in spring, 1988 on loblolly pine and slash pine seedbeds. No mulch was used over the Geotech application, and the application techniques were modified from the previous year. This year germination was slightly better for the Geotech treatment than for the mulch.

Indian Mound Nursery, located near Alto, Texas and operated by the Texas Forest Service, has a total seedling production area of approximately 116 acres. The original nursery site consisting of 40 acres of seedbed area was established in 1942 and expanded to its present size in 1970 and 1982. The major soil type for the nursery is sandy loam, with sand accounting for approximately 50 percent of the texture. Production is currently 24 million pine and 250,000 hardwood seedlings with loblolly pine (Pinus taeda L. comprising over 80 percent of the pine production. The vast majority of the seedlings are produced for the small private landowners in East Texas.

Geotech has been used in a number of applications throughout the South. It has been applied as a soil stabilizer on seedbed edges, applied under or over conventional mulches, or used as a replacement for mulch. Geotech has been used on an experimental basis at several nurseries for a number of years and is currently used on an operational scale at many areas. The compound itself is a white, thick liquid substance that, when mixed with water and sprayed on the bed surface, serves to stabilize the soil to prevent erosion and compaction.

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-Geotech is a product of Borden. Inc.

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The first trials using Geotech as a possible mulch replacement for pine seedbeds were established at Indian Mound Nursery in spring, 1987 and again in spring, 1988. Since the compound was used successfully at several nurseries on sandier sites, these trials would determine if the results would hold consistent on our soil type. Experience using Geotech was also necessary.

#### 1987 TRIALS

Two treatments with a control were used for the Geotech application trials in spring, 1987: 1) Geotech applied to the entire bed after sowing with a mulch of pine post peelings applied over the Geotech, 2) Geotech applied to the entire bed with no mulch used, and 3) control, pine post peelings applied as a mulch after sowing. Each treatment consisted of three beds: each bed was approximately 500 feet in length. The seedlot used for all treatments was a 1984 loblolly drought hardy seed orchard mix, extra large size.

The Geotech was mixed at a rate of one part Geotech to ten parts water with a defoamer added to the mix. An FMC hydraulic boom sprayer was used to cover three beds per pass, but two passes had to be used to apply 500 gallons of mix per acre. The beds were irrigated approximately 20 minutes per day during germination, and then, once germination was complete, they were irrigated approximately 3/4 to one inch per week over a three day period. Ten life history plots were established in each treatment, and each plot was six inches by four feet across.

#### 1988 TRIALS

Geotech trials were again established in spring, 1988 using Geotech applied to the entire bed with no mulch used.

Three seedlots were used for the trial: 1) loblolly nine, drought hardy, 1984 - Large, orchard mix, 2) slash pine (Pinus elliotii Engelm.), rust resistant, 1987 - Large, orchard 047 mix, 3) slash, rust resistant, 1987 - Large, orchard 173 mix. Three seed beds were used for each seedlot.

The Geotech mixture was similar to that of the previous year, but the FMC boom sprayer was modified using a twin boom so that only one pass was necessary to spray a single bed. The seed were sown to a depth of 1/4 to 1/2 inch to prevent any washoff of the soil or any contact between the seed and Geotech. After sowing, the irrigation regime was modified to maintain a moist soil surface on the beds during germination. Ten life history plots were established for each seedlot. Each plot was six inches by four feet across.

## RESULTS AND CONCLUSIONS

During 1987 very little difference in germination, survival or growth of the seedlings was detected on the beds using Geotech with mulch (Table 1). However it does appear that the Geotech aids in water penetration through our soil type. This could be an advantage if a hard pelting rain were to occur during germination, since these rains tend to cause the mulch to float off of the bed. Since Geotech promotes more rapid water penetration through the soil, the water from a pelting rain may be more readily absorbed decreasing the mulch loss. We observed greatly decreased germination, survival and growth in 1987 for the seedlings in the beds where the Geotech was used alone. This was probably due to the following reasons: 1) the soil was extremely dry when the Geotech was applied which limited penetration of the chemical, 2) due to the dry conditions, the soil was washed from the seed during the Geotech spray increasing seed exposure as well as seed contact with the Geotech, and 3) beds sprayed with Geotech require more water than beds covered with mulch.

Table 1. Summary of life history plot data comparing Geotech treatments at Indian Mound Nursery for 1987 and 1988.

YEAR	SEEDLOT	TREATMENT	May 25	June 25	October 25	CULL %
			Seedlings Per Sq Ft	Seedlings Per Sq Ft	Seedlings Per Sq Ft	
1987	Loblolly Drought Hardy 1984-XL	Geotech alone	11.0	8.5	7.1	25.5
	Loblolly Drought Hardy 1984-XL	Geotech w/mulch	30.3	29.3	27.7	8.7
	Loblolly Drought Hardy 1984-XL	Mulch (control)	31.6	30.5	29.9	9.5
1988	Loblolly Drought Hardy 1984-L	Geotech	31.7	31.8		
	Loblolly Drought Hardy 1984-L	Mulch (control)	31.1	31.1		
	Slash Rust Res. (047) 1987-L	Geotech	31.6	31.3		
	Slash Rust Res. (047) 1987-L	Mulch (control)	30.2	30.0		
	Slash Rust Res. (173) 1987-L	Geotech	32.4	30.8		
	Slash Rust Res. (173) 1987-L	Mulch (control)	25.9	25.4		

Geotech application techniques were modified for the 1988 sowing. Since we were mainly interested in an alternative to mulch, Geotech used alone was the only treatment. The beds were freshly tilled just before sowing so that the surface would be moist during the Geotech application to allow better penetration of the mixture. During sowing, the seed were placed 1/4 to 1/2 inch below the surface to limit any possible contact with Geotech. The soil surface was kept moist throughout the 21 day germination period. This year germination in the beds treated with Geotech was actually better for all three seedlots than that in the beds covered with mulch (Table 1). This trend has held through June where survival is still better in the Geotech treatments. To date, the seedling quality is comparable between the Geotech and the mulch treatments. However, those beds treated with Geotech require more water than those treated with mulch, which could be a limiting factor if a nursery, such as ourselves, has a limited water supply.

It appears that Geotech promises to be a viable alternative to mulch at Indian Mound Nursery. However, it remains to be seen if seedling quality at the end of the growing season will be affected. Future trials on a larger scale will be established in succeeding years to prove the usefulness of the compound.