

ESTABLISHING COMMERCIAL PINE FOREST ON MINE SOILS¹

By

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Abstract. At Dolet Hills Mining Venture eighty-eight percent of the reclaimed mine spoil will be returned to commercial pine forest. Common bermuda grass is established prior to the planting of pine seedlings in order to control erosion of the overburden material. Although this is an effective means of erosion control it creates sever competition with the pine seedlings when they are planted. To reduce this competition Oust/Velpar is applied in four foot bans after the trees have been planted. The Oust/Velpar is applied at a rate of 6 oz/acre Oust and 1 pint/ac. Velpar on sandy soils. On clay soils it is applied at a rate of 6 oz/ac. Oust and 2 pint/acre Velpar. The ban application allows for control of competition around the new seedlings yet leaves a healthy stand of common bermuda grasses between rows to control erosion.

Additional key words: Oust/Velpar, four foot ban, sandy soils, clay soils.

Introduction

The Dolet Hills Mining venture is located in DeSoto Parish, Northwest Louisiana, approximately 35 miles south of Shreveport. It is a single seam (average 6 ft. thick) operation. One 1570 B. E.

walking dragline is used to remove overburden. Operations began in August 1985. About 275 acres per year are mined in order to deliver 2.75 million tons of lignite to the Dolet Hills Power Station. The lignite lies in the Wilcox Group and is part of the Sabine uplift (Espy 1985) with overburden varying from 20 feet to 140 feet with an average thickness of 70 feet. The climate is a transition between the primarily humid subtropical climate to the south and the less humid, continental climate of the plains states to the north. The average annual rainfall is about 48 inches (Page and Pree 1964).

¹Paper presented at 1992 American Society for Surface Mining and Reclamation Meeting, Duluth, Minnesota, June 14-18, 1992.

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**TABLE 1
DHMV TREE PLANTING AND SURVIVAL**

Year	Trees Planted	Treatment	Rainfall	Survival
1988	140,000	6 oz. Oust/1 pt. Velpar	42"	61% or 453/Ac.
1989	280,000	6 oz. Oust/1 pt. Velpar Sandy Areas 6 oz. Oust/2 pt. Velpar Clay Areas	78"	92% or 681/Ac.
1990	30,000	None	69"	30% or 222/Ac.
1991	78,000	6 oz. Oust/1 pt. Velpor	84"	97% or 717/Ac.

At The Dolet Hills Mining Venture 88 percent of the reclaimed mine soil will be reclaimed to commercial pine forest. The successful establishment of pine trees hinges on two factors. First, the stabilization of the regraded mine spoil to prevent erosion. Secondly, the control of herbaceous species during the first year of pine tree establishment.

Operations

Approximately 70 percent of the reclaimed mine soil to date has a sand content of 65 percent or greater. This combined with the rolling topography and frequent high intensity rainfall events affords many opportunities for severe erosion to occur. The primary method of erosion control is the establishment of common bermuda grass on the regraded areas.

Although common bermuda grass is one of the best grasses for the control and prevention of erosion, it is one of the worst for establishing young pine seedlings. A vigorous stand of common bermuda grass will often out-compete the pine seedlings for moisture

during the first growing season, under a variety of conditions. To combat this an application of Oust/Velpar is used to control the common bermuda grass during the pine seedling's first year.

After common bermuda grass has been established and erosion is controlled (1-2 years in most cases) the pine seedlings are planted. Seedlings are planted on a 6 X 10 foot spacing (726 per acre) during the December through February time period.

After the seedlings have had some time to recover from the transplanting process, the Oust/Velpar herbicide is applied in late February/early March (DuPont 1984). A tractor-pulled boom sprayer is used to apply the Oust/Velpar in a four foot band in order to control competition around the young pine seedlings and allow for erosion control between the rows.

The most often used rate has been 6 ounces of Oust and 1 pint of Velpar per acre. This gives very good control on sandy and loamy soils and moderate control on soils with higher

clay content. In areas where higher clay contents are found application of 6 ounces of Oust and 2 pints of Velpar per acre have been used. To do this the regraded spoil has to be sampled and the soil units identified (DuPont 1984) prior to applying the Oust/Velpar. If an application of 2 pints Velpar per acre is applied to a sandy soil it can cause damage to the pine seedlings. This damage may include needle brum, injury to the meristematic tissue, and in severe cases, the seedling may die.

Effective control of the common bermuda grass does not mean you have to kill everything in the four foot band. In most cases there will be little or no grass in the immediate area of the trees and varying amounts of litter and stunted grass as you move to the outside edge of the band. The most marked results will occur in sandy soils with clay soils showing much less of an effect. While the visual effect of the treatment on the bermuda grass does not show up as much on clay soils, it is very effective in reducing competition to the pine seedlings. One application of Oust/Velpar will control competition from bermuda grass for one growing season. This allows the pine seedlings to establish a root system that can compete with the bermuda grass in succeeding growing seasons.

In 1991 the price for Oust was \$127.35 per pound and \$38 per gallon of Velpar. The spray rig cost was \$8 per acre to apply the treatment. A 6 ounce Oust/1 pint Velpar treatment applied was \$60.50 per acre. If 2 pints of Velpar were used it would cost \$65.25 per acre.

Table 1 lists trees planted, treatment rates, rainfall and survival by year (1988-1991). In 1988 the 42 inches of rainfall was below the 48 inch normal, with an extended period of dry weather during the summer. Years 1989-1991 were well above normal including the summer months. Oust/Velpar was not applied in 1990 due to wet conditions in the field. Initial survival rates were checked in October of the year trees were planted with a follow-up count the following January.

Conclusion

The Oust/Velpar treatments allow for the use of common bermuda grass to control erosion and at the same time reduce competition to the pine seedlings during the critical first growing season.

Survival rates during years 1988, 1989, and 1991 are well above the 350 trees/acre required for bond release. However, in 1990, survival was only 222 trees/acre. Although it was a wet year and the pines did not go through an extended dry period they could not compete with the bermuda grass. Dolet Hills Mining Venture had originally felt that the Oust/Velpar treatment would help most in those dry years when the lack of seeding moisture would be critical to the pine. However, the survival rate during 1990 indicates that it may be just as important to survival during wet years.

Literature Cited

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