

**Leafy Spurge Control with Chemical and
Mechanical Treatments - 1988**
Dickinson Experiment Station

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A study to test the effects of chemical and mechanical treatments on leafy spurge (*Euphorbia esula*) was started in 1984 at the Dickinson Experiment Station. The chemical Picloram (Tordon) at 2 lbs. ai/acre (1 gallon of 22K liquid or 100 pounds of 2K granules) has been shown by many scientists to reduce leafy spurge and it is one technique that is accepted and recommended as a good treatment for leafy spurge control. It is not an inexpensive treatment. The mechanical treatment of mowing leafy spurge has been observed to reduce the density of leafy spurge at times. Observations also have been made that spraying picloram on leafy spurge regrowth two weeks after mowing increases the effects of the chemical. These observations of the effects of mowing of leafy spurge need to be tested to determine if mowing has a beneficial or detrimental effect on leafy spurge. If this study shows that mowing of leafy spurge can be beneficial or additive to chemical treatments, a follow-up study will be needed to test if the rate of chemical applied can be reduced.

The test plots were established on 0.25 acres located on the NE¹/₄, SE¹/₄, NE¹/₄ Sec. 4, T. 140 N., R. 103 W. on the property of Cecil Adams. The 30 x 22 foot plots were arranged in a randomized block design with two replications. The soil was Havrelon silt loam. The range site was overflow. The vegetation on the site was predominantly leafy spurge with a few scattered plants of silver sage (*Artemisia cana*) and wolfberry (*Symphoricarpos occidentalis*) and a thin understory of Kentucky bluegrass (*Poa pratensis*), prairie sandreed (*Calamovilfa longifolia*) and needleandthread (*Stipa comata*).

The treatments were: in early June, mowing, mowing plus Tordon, and Tordon; in early July, mowing, mowing plus Tordon and Tordon; and in mid August, Tordon. A control of no treatment was included in each replication. The early June, early July, and mid August periods of treatment coincided with pre-flower, post flower (seed development) and early regrowth phenological stages of development for the leafy spurge plants, respectively. The mowing treatment was conducted with a sickle bar mower and the herbage was raked off the plots. The chemical treatment was applied at a rate of 2 lbs. ai/acre of picloram in the form of 2K granules with a hand held whirlybird spreader.

A second set of plots was established in 1986 on 0.25 acres located on the NE¹/₄, SE¹/₄, NE¹/₄, Sec. 4, T. 140 N., R. 103 W. on the property of Cecil Adams in the Knutson Creek drainage. The 30 x 22 foot plots were arranged in a randomized block design with two replications. The soil was Havrelon silt loam. The range site was overflow. The vegetation was predominantly leafy spurge with a few scattered plants of silver sage (*Artemisia cana*) and wolfberry (*Symphoricarpos occidentalis*) and a very thin understory of a few plants like Kentucky bluegrass (*Poa pratensis*) and prairie sandreed (*Calamovilfa longifolia*).

Picloram in the form of pellets (Tordon 2K) was applied in early June using a handheld whirlybird spreader at three different rates: 0.25 lb. ai/acre, 0.50 lb. ai/acre, and 1.00 lb. ai/acre were applied with mowing and without mowing. A mechanical treatment of mowing in June and July along with a control of no treatment were included in each replication. Mowing treatments were conducted with a sickle bar mower and the herbage was raked off the plots.

The data that were collected from these two sets of plots were: above ground herbage production, leafy spurge stem densities, and mean weight per leafy spurge stem. Data will be collected from these plots with no retreatment for another year in order to follow the effects of chemical and mechanical treatments on leafy spurge.

Mowing leafy spurge in June or July reduces herbage production considerably and appears to increase stem densities one and two years after treatment. Annual repeated mowing in June and in July appears to promote some reduction in stem densities. Spurge plants in these treatments stayed green longer in the fall (October), while spurge in the control and chemically treated plots were turning yellow-brown and drying up. Mowing plus chemical treatment has some added effect compared to chemical alone one year after treatment, June applied and two years after treatment, July applied when used with Tordon 2K at 2 lbs. ai/acre. Mowing plus June applications of Tordon 2K at 0.25, 0.50, and 1.00 lbs. ai/acre reduced stem density 86%, 90%, and 98% respectively, 60 days after treatment.

Tordon at 2 lbs. ai/acre was effective in killing the top growth of leafy spurge for the June, July, and August application dates. Tordon 2K at 0.25, 0.50, and 1.00 lbs. ai/acre applied in June reduced stem density 63%, 70% and 88% respectively, after 60 days. The combination of mowing plus Tordon treatments appeared to have a more larger effect on the top growth than Tordon alone.

Mowing of leafy spurge did have some detrimental effects. It may or may not be significant. Mowing alone may be an alternative to no treatment in areas where leafy spurge can be reached with a mower and where cost was a factor. Tordon at 0.25, 0.50, 1.00, and 2.00 lbs. ai/acre was effective in top growth kill. The combination of mowing plus lower rates of Tordon appear to additively control spurge to a degree.

Leafy Spurge Control by Chemical and Mechanical Treatment in 1984

Location:	NE ¹ / ₄ , SE ¹ / ₄ , NE ¹ / ₄ Sec. 4, T. 140 N., R. 103 W. Property of Cecil Adams
Replications:	Two Randomized Block Design
Study Size:	62' x 178' 0.25 acres
Plot Size:	22' x 30' 0.02 acres
Perimeter Border:	2'
Soil:	Havrelon silt loam
Range Site:	Overflow
Application Rate:	2 lbs. ai/acre of Tordon 2K pellets
Application Dates:	Early June – 4 Jun 1984 Early July – 6 Jul 1984 Mid August – 8 Aug 1984
Treatments:	Control Early June Mow Early June Mow + Tordon 2K Early June Tordon 2K Early July Mow Early July Mow + Tordon 2K Early July Tordon 2K Mid August Tordon 2K