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# BULLETIN

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## WEED CONTROL RESEARCH IN SUGAR BEETS

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Total sugar beet acreage in the Texas Panhandle has varied from 20,000 to 40,000 acres since Holly Sugar Corporation started operations in 1964. Excessive weed control methods and high hoeing costs, excessive nitrogen fertilization, and leaf spot disease have created problems for sugar beet producers. Weed control methods that have been satisfactory for other sections of the country have not been consistently effective in West Texas.

Since 1964, herbicide treatments and cultural practices have been evaluated for controlling weeds in sugar beets grown in the Panhandle of Texas. Prior to planting, herbicides were either injected or sprayed on dry beds and power incorporated. After emergence, herbicides were applied at various stages of weed and sugar beet growth, and herbicides were incorporated into the soil at layby. Various combinations of herbicide application and cultural practices were made to find the most effective weed control procedure. This research has been a cooperative effort among The Texas Agricultural Experiment Station and USDA Agricultural Research

Service, Bushland; Holly Sugar Corporation, Hereford; Texas Tech Center, Pantex; and farmers in the Panhandle.

### *Preplant Incorporation*

The effectiveness of preplant herbicides improved as average temperature increased. Pyramin and Tillam gave little weed control in March when sugar beets are normally planted but worked well when applied in May. Pigweed control with Pyramin and Tillam increased as thoroughness of incorporation increased. CP45592 and CP52223 gave acceptable weed control, but development of these herbicides was discontinued by the manufacturer because of chemical injury to sugar beets in other parts of the country. Good weed control was obtained with 11913, but serious injury to sugar beets occurred in 1 year of the 3 this herbicide was tested.

### *Preplant Injection*

Eptam was the most effective herbicide tested as a preplant injection. Injury to sugar beets was moderate. Treflan and Planavin gave fair control without causing crop injury. Injection of Pyramin and Tillam into dry beds was more economical and effective than being sprayed on dry beds and power incorporated.

### *Postemergence*

Postemergence herbicides available before 1968 gave erratic results. Pyramin Plus controlled pigweed in the cotyledon stage but was not effective if weeds were larger or soil was dry. Other postemergence

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The complete report, B-1158C, "Weed Control Research in Sugar Beets" with an appendix, 12 tables and 4 figures, is available from Research Publications Editor, Department of Agricultural Communications, Texas A&M University, College Station, Texas 77843. Allow one month for delivery.

herbicides that controlled pigweed and kochia sometimes caused severe injury to sugar beets.

Since 1968, Betanal has been very effective against small kochia and Betanal-475 very effective against pigweed. Each herbicide has been effective against very small barnyardgrass. Good control of all three weeds has been obtained from a 50-50 mixture of the two herbicides. Betanal mixed with Dowpon eliminated pigweed and controlled more than 80 percent of the barnyardgrass but was somewhat injurious to sugar beets.

In 1970 and 1971, several postemergence herbicides were applied to sugar beets and weeds at two stages of plant growth. Betanal gave the best control of kochia. Small weeds at the first stage were most easily killed. Kochia was not controlled with any treatment at the second application. In 1971, small pigweed and a few kochia were nearly eliminated with Betanal-475, Betanal + Dowpon, SN 503, and Nortron. When pigweed were larger, only Betanal, Betanal-475 and a mixture of Betanal and Dowpon gave good control. In 1970, when soil was dry, sugar beets were not stunted or injured at either stage of growth. In 1971, when sugar beets were small and the soil was wet, early season injury was evident with Betanal + Dowpon and Nortron. Sugar beets outgrew any injury by August.

In 1969, a study was conducted to determine whether two applications of postemergence herbicides in 1 year were more effective against pigweed and barnyardgrass than a single application. An early application with Pyramin Plus and Betanal resulted in better weed control than a later application to larger weeds. When weeds were double treated, control of both pigweed and barnyardgrass was greatly improved. Sugar beet injury was slightly increased, but plants recovered before fall.

#### *Injection and Postemergence*

In 1969, several combinations of injected and postemergence herbicides controlled weeds but caused excessive injury to sugar beets. In 1971,

however, Eptam at 3 pounds per acre was the only injection treatment that reduced beet stand. Nortron was the most effective herbicide when injected at 3 pounds per acre and applied again postemergence at an early stage. Postemergence treatments were more effective against small than large weeds.

#### *Preplant and Early Postemergence Injections and Layby Incorporated*

Compared with untreated areas outside of the study, preplant injection application of Ro-Neet reduced weeds from 20 per foot of row to about 4 per foot of row. This reduced layby hoe time from about 35 hours per acre on untreated areas to 14 hours per acre where Ro-Neet was injected. Early postemergence injection at first cultivation did not affect weed population. Prior to applying layby treatments, all plots were hoed. At harvest there was about 1 weed in 10 feet of row where no layby treatments were applied. Eptam reduced pigweed to about 1 weed in 20 feet of row, and Treflan treatments were almost weed free at harvest. Treatments did not affect sugar beet tonnage or percent sugar; however, when sugar per acre was calculated, differences occurred. Neither high nor low yield was related to weed control obtained. Pigweed control obtained after layby did not increase yield.

#### *Conclusions*

Since 1969, new experimental herbicides have produced more effective weed control in sugar beets than was previously possible. Ro-Neet has proved more effective than Tillam for preplant injection and preplant incorporation. Nortron at 2 to 4 pounds per acre has given outstanding control of pigweed and kochia when applied preplant and incorporated. The best prospect for reducing hoeing costs in sugar beets is to apply both a preplant herbicide and a postemergence herbicide. Fields that are weed free at layby can be kept clean with a broadcast-incorporated application of Treflan.

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