

Results Obtained by Sugar Beet Growers Through the Use of TCA¹ for the Control of Pigeon Grass² in Southern Minnesota and Northern Iowa During 1951

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In southern Minnesota and northern Iowa, the weed that presents the greatest problem to sugar beet culture is pigeon grass. Primarily as a result of the cropping system of the area, pigeon grass grows in the fields in such profusion as to literally create a sod condition in the beet row. Thinning of sugar beets is made difficult, and the timeliness of the operation is often lost. Beet seedlings experience tough competition for the available moisture and fertility, thus adversely affecting maximum growth.

Following the Northwestern Weed Conference at Fargo, North Dakota, in the spring of 1949, Quamme and Ogden (1)⁴ undertook extensive experimental chemical weed control plot work wherein some thirty treatments of various chemicals in varying rates and concentrations were compared. The outstanding control of grasses in the TCA plots, accompanied by no apparent damage to the beets, was so pronounced that strip work on growers' fields was undertaken in 1950. Again, the results were very outstanding and an energetic program was undertaken to acquaint the beet growers with the benefits of this practice.

In 1951 a number of growers sprayed 5,473 acres of sugar beets in southern Minnesota and northern Iowa. In practically all instances the material was applied as a pre-emergence spray at a rate of six to eight pounds 90 percent Sodium TCA in 20 to 30 gallons of water per acre. A few growers used the liquid 50 percent Sodium TCA at a rate of five pounds per gallon per acre.

The results obtained were extremely gratifying to growers and field workers alike. In all but a few instances, where failure could be traced to improper dosage or improper premixing, the pigeon grass was controlled satisfactorily. Growers required a lesser number of workers to thin a given acreage of beets, and, by the same token, the workers' daily earnings were increased. Despite continuing rains which kept all field workers idle for a period of ten days at a time when the thinning load was at its peak, the grass was effectively controlled by the chemical so that no weed problem developed. The control was effective over a period of six to eight weeks. It is probable that varying conditions in future years may present new problems, but several conclusions have been reached through the program of the past years, permitting thereby certain definite recommendations which are:

Ground spraying is preferable to application from airplane. Proper

¹ Sodium Trichloroacetate.

² The term "Pigeon Grass" as used in this article is the common name for green foxtail (*Setaria Viridis*) and yellow foxtail (*Setaria Lutea*).

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⁴ Numbers in parentheses refer to literature cited.

coverage is all-important and planes are rarely able to economically apply the 20 to 30 gallons per acre recommended rate. Since the important avenue of entry for the chemical is through the roots, it will be realized that the 20 to 30 gallons of water recommended per acre is simply to insure proper mixing and complete coverage. Precipitation in sufficient amounts must follow to insure the chemical being carried down to the roots. One inch of precipitation is sufficient to accomplish this. As of interest, however, the six and one-half inches of rain which was received in 1951 over a four-week period did not detrimentally affect the response to the treatment.

If the sprayer has been previously used for 2,4-D work, a thorough cleansing is necessary. One quart of household ammonia in the sprayer filled with water will neutralize the acid. Soda can be used satisfactorily, or one of the several commercial products sold for this purpose, such as Nutra-Sol available at a cost of approximately 75c a treatment. A thorough pre-mix of the TCA in water is imperative. The powder is soluble in water and approximately four pounds can be dissolved in a gallon of water. "Warm water simplifies this process very materially. Nozzle plugging can be avoided by straining the material when emptying into the sprayer. The use of liquid TCA eliminated the problem of securing a complete mix such as encountered in the case of powder; however, until this year chemical companies did not offer a container suitable for carrying over any excess material from one year to the next. Corrosion of equipment is not a problem since the material used had an inhibitor added. It is necessary only to thoroughly wash out the tank and boom with water following each usage.

Proper rate of application of TCA and gallonage of water must be accurately controlled. The proper nozzles, proper pressure and proper ground speed will result in the desired application. Use of a spray meter and a tractor speedometer are recommended. The boom should be so adjusted that the spray from the nozzles does not overlap more than an inch or two.

In comparison field tests, it has been determined that such susceptible crops as soy beans, corn and most of the clovers apparently can be planted with safety the second year after spraying of the preceding crop had been made.

Literature Cited

(1) OGDEN, DELMER

1949. Annual Report of Research Work, American Crystal Sugar Company, Mason City, Iowa.