HANNCHEN barley is grown extensively in the Willamette Valley and the Klamath Basin areas of Oregon as a malting barley. In recent years the use of nitrogen fertilizer to increase yields has become a rather common farm practice. The fertilizer is generally applied in a dry form either before the soil is worked, at seeding time, or as a top dressing when the grain is still small enough to withstand the passage of the fertilizer equipment.

The rainfall pattern during the growing season of the Willamette Valley normally provides a wet spring but an extremely dry summer. This pattern makes spring applications of nitrogen fertilizer sometimes hazardous or wasteful as far as the immediate crop is concerned. The beneficial response to a spring application of nitrogen may depend upon the time and rate of application combined with the available moisture or an effective rain after the surface application is made.

The value of fertilizing plants with soluble nitrogen in the form of a foliar spray has recently aroused considerable interest, particularly with horticultural crops. This has raised the question whether or not foliar applications of nitrogen would be satisfactory to use on grain crops as well. If the application of nitrogen was successful as a foliar spray, it might also be practical to combine the fertilizer applications with spraying for weed control in one operation.

It was the purpose of these experiments to study the effect of different rates and times of application of nitrogen applied both in the dry form and as a foliar spray on the yield of Hannchen barley.

REVIEW OF LITERATURE

Although extensive studies have been made on the effect of nitrogen on the yield of wheat under dryland conditions,

few trials have been reported in the literature on the response of spring barley. Most of the recommendations for fertilizing barley in the Willamette Valley originated from observational trials and from the general knowledge of crop response.

Hill reported that barley responded well to fertilizer, particularly nitrogen, in a study of malting barley production in the Willamette Valley, and recommended an adequate amount of nitrogen be available for barley.

The application of nitrogen to cereal grains as a foliar spray has received very little attention and only limited reports are available. Finney in experiments in Kansas found that applications of urea as a spray increased yield if applied before flowering, but decreased yield if applied during the flowering period. Evans in experiments with wheat at seven locations in the dryland region found increases in yield from spray applications of nitrogen in four out of the seven locations, the earlier treatments giving the highest yields. Spray applications at flowering and post flowering had no effect on yield.

MATERIALS AND METHODS

The experimental plots were located on Willamette Valley land near Corvallis, Oregon, adapted to the production of cereal crops. It is a slightly acid soil and chemically well supplied, although it responds well to lime and additional nitrogen usually pays its way.

The barley fertility plots followed sudan grass where the sudan grass was fall plowed and the land cultivated during the winter. Seedbeds for the plots were spring plowed followed by a shallow discing and the plots were nonirrigated.

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