

Precision Planting Lettuce
(B. L. Harriott)

Abstract: Compared to current planting practices using naked lettuce seed, precision planting coated lettuce seed can result in substantially reduced thinning costs, increases in number of marketable lettuce heads per acre, and higher average head weight. The use of coated seed, however, requires more attention to seedbed preparation, planting depths, irrigation schedules, and stand maintenance. Hill-dropping naked seed does not appear to offer advantages over conventional planting practices except in a slight reduction of seed cost per acre.

Introduction

As the problem of agricultural labor becomes more and more acute, each phase of vegetable production that requires hand labor becomes an increasingly important area for mechanization research. Next to harvesting, stand establishment requires the most hand labor in lettuce production. It is estimated that precision planting lettuce to a stand could potentially increase grower profits as much as \$60.00 per acre. Also, precision planting would aid in maintaining bed shape throughout the production period. Uniform bed shape is extremely important for satisfactory operation of the mechanical lettuce harvesters now being developed.

Methods

Two experiments investigating six methods of planting lettuce in addition to conventional planting have been completed at Mesa. Planting methods investigated in the tests included the following:

1. Standard naked seed planting in conventional seedbed.
2. Hill-dropped naked seed in conventional seedbed.
3. Hill-dropped naked seed in strip tilled seedbed.
4. Hill-dropped naked seed in strip tilled seedbed with petroleum mulch application.
5. Precision planted coated seed in conventional seedbed.
6. Precision planted coated seed in strip tilled seedbed.
7. Precision planted coated seed in strip tilled seedbed with petroleum mulch application.

Hill-dropped seed was planted with 4 inch hill spacings and the coated seed was planted with 3 inches between each seed. Seed depth for all plantings in the first test conducted was 1/8 inch. Early observations in this experiment indicated that a seed depth of 1/4 inch would be more satisfactory for coated seed. Subsequent experiments in which 1/4 and 1/2 inch planting depths were used for the coated seed confirmed this observation.

Thinning in all of the naked seed plantings was conducted according to current thinning practice. Thinning in the coated seed plots was done with a long handled hoe since isolation of single plants by finger thinning was not required.

Data collected from the experiments included plant population both before and after thinning, number of marketable heads at harvest time, weight of marketable heads, and thinning labor requirements.

Results and Discussion

There appears to be very little advantage in hill-dropping naked seed over conventional planting techniques. There is some savings in the amount of seed used and a small reduction in thinning labor requirements with this planting method but significant differences in yield and uniformity at harvest as compared to standard practices were not observed.

Precision planting coated seed, however, offers several advantages over conventional planting practices for naked seed. Although a higher plant population after thinning was obtained with standard planting techniques, the number of marketable heads, average head weight, and percent of heads harvested during the first cut was higher in the coated seed plots where the seedbed was properly prepared. Also, thinning labor for the precision planted plots was more than 50% less than the conventionally planted plots.

Correct seedbed preparation for the coated seed is very important. Satisfactory stands were not obtained in the experiments reported here when the coated seed was planted in rough beds that contained large clods. It is apparent that some type of precision tillage to seed depth or slightly below is necessary in many cases. However, unless a petroleum mulch application is to follow planting, the soil should not be completely pulverized because of the potential crusting problem. Petroleum mulch applications on fall lettuce seedbeds previous to November 1 in the Salt River Valley create seedbed temperatures beyond that suitable for satisfactory stand establishment.

The use of coated seed for lettuce production appears to have excellent potential for increasing profits. However, seedbed preparation, irrigation scheduling, insect control, and disease control prior to thinning are even more important when coated seed is precision planted because of the lower total number of plants. Hence, a more intensive management of the crop is required if the full potential of precision planting is to be realized.

Lettuce Nutrition as Influenced by Nitrogen, Phosphorus, Potassium
and Magnesium Fertilization
(L. A. Stanersen and Fred Turner, Jr.)

Greenhouse Experiment

Two soils from Cochise County were selected for the study. One soil was a McAllister sandy clay loam which had received little or no fertilizer during