

## THE NEED FOR IMPROVED SUGAR BEET EMERGENCE

J. E. Coke<sup>1</sup>

Improvement of sugar beet seedling emergence is in my opinion one of the most pressing problems now involving the production of beets. I fail to see how we can fully capitalize on the use of single germ seed, precision planters, or the present mechanical methods of blocking unless and until methods are developed which will assure uniform field germination with a high percentage of emergence.

During the past five years, beet growers in our area found it necessary to replant annually an average of  $14\frac{1}{2}$  percent of their planted acreage, largely because of irregular or poor emergence. In addition to this replanted acreage, there are always a large number of fields having beet stands so light and so ununiformly spaced that maximum yields are not possible. These fields are maintained only because delay in securing a stand by replanting would probably result in no greater yield than that obtained from the unsatisfactory stand.

Whereas, we attempt to secure thinned stands averaging between 100-125 beets per 100 foot of row, depending on the area involved, our stands average between 94-107 beets per 100 foot of row, with some stands as low as 50.

In 48 planting tests conducted in 1946, the average emergence for the plots located in the interior valley was 41 percent of the potential seedlings, while in the coastal district, the emergence averaged 60 percent. Most significant, however, is the wide variation in the percentage potential field emergence, which ranged from a low of 10 percent to a high of 80 percent. This wide range in field germination adds real emphasis to the necessity of improving conditions in the field to secure a higher germination, thus narrowing the range of field germination.

Another indication that our beet stands are not what they should be is the low average (1941-1945) of 72 beets per 100 foot of row, which our growers have harvested. It is recognized that poor emergence is not solely responsible for the low stand at harvest, but certainly it is an important contribution.

None of the data given above tells the real story regarding emergence of beet seed; and, unfortunately, we have no data showing the degree of uniformity or lack of uniformity of stands. Inasmuch as uniformity of stand is of such importance in producing maximum yields, without data of this type we cannot adequately evaluate the importance of the problem of securing satisfactory emergence. Until we develop methods which will assure uniform and high emergence, growers must, of necessity, continue the use of reasonably heavy planting rates, which to a large extent eliminate the value of single germ units and precision planters. Lack of uniform stands also makes impractical, or extremely difficult, securing acceptance of mechanical blocking as it has been developed in commercial operations.

<sup>1</sup> Vice President, Spreckels Sugar Company, San Francisco, California

Therefore, a coordinated and intensive project designed to find solutions to this problem is, I believe, most important and should be directed toward at least the following lines:

1. Methods of planting in which the seed will be accurately placed as to depth and placed firmly in contact with soil of sufficient moisture to insure germination; the surface soil to be in such condition as to minimize (1) the loss of moisture from the soil around and below the seed, and (2) the formation of a surface soil crust, or to provide a positive method of crust removal or breaking.

With our present method of planting, much of our seed is planted in grooves or furrows with little soil packed around the seed, and frequently such soil as does come in contact with the seed is from the dry surface portion. Because of this haphazard placement of the seed, the grower tries to plant at the depth which he considers most satisfactory for the type of weather he expects to prevail during the period of seedling emergence. Needless to say, his guess is usually wrong.

2. Seed should be prepared so as to induce rapid and vigorous germination. This may include methods of soaking seed in water, treatment with chemicals, or decortication.
3. Methods should be developed which will eliminate the early growth of the seedling so that the plants will reach the surface in a vigorous growing condition in the minimum of time.