4.0 mm	3.5 mm	2.5 mm	Random Size
92.79%	87.79%	74.0%	84.88%
225 sprouts	169 sprouts	119 sprouts	177.54 sprouts

These results indicate that to eliminate bias in preparation of a sample the use of a mechanical grain sampler (such as Boerner) is necessary to secure a representative sample.

Tests conducted on presoaking of seed for 2 hours prior to conduct of germination test versus dry seed, show that with beetseed from a fresh crop this treatment is not necessary, unless presence of toxic substances in the seed coat has been shown. However, on older seed, the presoaking treatment is beneficial.

Tests were conducted in using tap water and distilled water in moistening the paper toweling, blotting paper and sand, and in presoaking of seed. The results obtained indicate that when the tap water is available of the quality indicated in these tests (about 800 p.p.m. mixed salts) there is no advantage to be gained in distilled water.

Tests conducted with different lengths of germination period, indicate that reporting of results at the end of 10 days is preferable to waiting 14 days before concluding the test. It would seem that for practical field purposes the germination count obtained on most germination tests at the end of 7 days is the important consideration from standpoint of producing vigorous seedlings of uniform size. Apparently, greater emphasis should be placed on vigor and condition of seedlings than relying entirely on percentage germination as a sole index of acceptability of seed.

Conclusion

The results of tests discussed in this summary of results from work conducted in 1935 - 1936 - 1937, indicate the need of a random sample of beetseed (mechanically reduced to proper sample size), presoaking seed (especially older seed) the choice of either paper toweling or blotting paper, reporting results of test at end of 10 days, and supplementing laboratory tests with field test wherever possible so as to determine vigor of seedling plants. Germinating beetseed at cooler temperatures appears desirable. The tentative choice of a 20° C. continuous temperature seems warranted by these tests. Further work on this point is necessary to establish best temperature methods.

SOME FACTORS WHICH INFLUENCE THE RATE AND TOTAL PERCENTAGE GERMINATION OF SUGAR BEET SEED

Bion Tolman and Myron Stout
U.S.D.A.

Seeds from various varieties of sugar beets vary in both rate and total percentage germination. This difference between varieties is largely dissipated when the naked seeds are germinated after being removed from the corky pericarp. Toxic substances are present in the seed ball which affect both rate and total germination, and which when present in sufficient con-

centration totally inhibit germination. These substances are water soluble, insoluble in ether, acetone and toluene, and partially soluble in absolute ethyl and propyl alcohol. The toxic effect of a water extract from seed balls on the germination of naked sugar beet seeds is not diminished by boiling the extract. Some toxic substances remain in the ash of the water soluble extract.

Pre-germination subsequent to alternate soaking and drying of the seed gives a further increase in rate and total percentage germination.

EXPLORATORY STUDIES IN SEED GROWING UNDER DIFFERENT CLIMATIC CONDITIONS

George T. Scott
West Coast Beet Seed Committee

Up to the present, beet seed growing has been largely confined to areas in the southwestern United States where relatively mild winter temperatures are the rule. Under such conditions, with most of the curly-top resistant strains now in use, the bolting requirement has been met and satisfactory yields of good quality seed have been produced. On the other hand, some of the newer strains which have a higher bolting requirement, when planted in these warmer areas, have been disappointing in seed production.

It has been observed that in the case of some strains which may bolt in sufficient percentage in the milder areas to produce a fair yield of seed yet fall short of 100% bolting. As might be expected in the case of a crop of seed produced under conditions where bolting is less than 100% there is brought a selection in favor of bolting, i.e., that fraction of a variety with the least bolting tendency is automatically eliminated from the seed increase. It is that fraction which is most desirable from the standpoint of the beet grower and the processor.

It is possible that with some changes in cultural methods, such as earlier planting, heavier nitrogen fertilization, etc. in the warmer areas, the situation may be remedied by increasing the percentage of bolting in a given variety, however, since the main factor involved seems to be one of temperature the obvious remedy, especially with varieties of higher bolting requirement is to grow these varieties in colder areas.

One phase of the work of the West Coast Beet Seed Committee is to make exploratory studies in seed production in northern areas or where the exposure of the crop to cold would be greater. We have also found that in addition to proper temperatures, good soil, adequate moisture, etc., another requirement which is equally important if we are to expect any permanency in beet seed growing is good farmers.

During the past season we had small plantings in two of the smaller valleys of Northern California and in the Tulelake district which is part of the Klamath basin. In two of these we later found that we were late with our planting date so that the beets as they went into the winter were of such small size that considerable winter injury resulted. Plants which survived the winter grew well in spring and later produced nice quality seed.