

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

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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 Tulalake 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.

The most interesting planting of an exploratory nature was one put in with the Branch Experiment Station of Oregon Agricultural College at Talent, Oregon. This planting had better care than most of our plantings in the northern area and responded accordingly. In this planting were included the following varieties: U. S. 12, U. S. 14, U.S. 33, U.S. 550 and A-600. Of this list #12 and #33 bolt fairly easily, the others, #14, #550 and A-600 are in their original stock comparatively refractory bolters. Under the conditions of this test these moderately difficult bolters responded about equally to U.S. 12 and 33. The yields of seed of these varieties, calculated to acre basis were as follows:

U.S. #12	*	2818#	-	88.75%	germ
U.S. #14	-	3243#	-	85.50%	"
U.S. #33	-	3412#	-	91.75%	"
U.S. #550	-	2790#	-	81.75%	"
A-600	-	3538#	-	82.25%	"

GROWING SUGAR BEET SEED UNDER DIFFERENT CLIMATIC CONDITIONS

Bion Tolman, C. H. Smith and Albert Murphy, U.S.D.A.

Experiments conducted in southern Nevada, southern Utah, northern Utah, and Idaho, reveal considerable information with regard to the possibility of growing sugar beet seed under a wide variety of conditions.

In southern Nevada the mild winter climate is conducive to considerable winter and early spring growth, and while excellent results are secured with certain commercial varieties now being grown, experiments have shown that non-bolting varieties cannot be reproduced there. In northern Utah seed has been grown for the past four years at elevations ranging from 4300 to 5500 feet. Here the best results have been secured at the higher elevations where temperatures are lower and where seed maturity is more gradual. In some instances damage has resulted from winter injury, but during four years experience no planting has been completely lost. Generally the yields of seed have also been satisfactory.

A more serious problem, particularly in Utah Valley, Salt Lake and Tooele Valley, has been injury to seed development from heat and possibly other unknown factors. Experiments are being conducted to determine the cause of this injury to germination, but some phases of the problem are very puzzling. Until more information is available commercial expansion of the seed industry will undoubtedly be towards regions where good quality of the seed can be depended upon.

DATE OF HARVEST OF SUGAR BEET SEED

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Tests were conducted at Hemet, California, in two seasons. The first test was preliminary. In the second test, extensively randomized plots were