storage of sugar beets to produce as nearly perfect beets at the end of the storage is the goal to be obtained. Death and natural decay set in the moment the beet is removed from the soil and any condition that will hasten this natural process is to be avoided. Frozen beets or overheated beets reduce the sugar content and purity of the juices and are to be avoided if a good quality of sugar is to be produced.

WEED INVESTIGATIONS
by the
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During the past few years attention has been concentrated on chemical methods of weed control. Research has been directed to the effects, limitations, and applicability of sulphuric acid, carbon bisulphide, acid arsenical, and the chlorates. In addition, study has been made of soil sterilization methods, and a combination of treatments. Most of the results of the foregoing studies have been published, but certain more recently discovered relationships are herewith summarized.

Biological toxicity tests on four California soils show that arsenic toxicity is highest in Fresno sandy loam, intermediate in Columbia fine sandy loam, and low in Yolo clay loam and Stockton adobe clay. Variation from previous tests is explained on the basis of differences in the soil samples.

Repeated cropping of the test cultures showed that arsenic toxicity decreased in all soils until, with the seventh crop, plants in the Yolo and Stockton soils survived in cultures containing 3000 p.p.m. As_2O_3 in the air-dry soil. Differences between the Fresno and Columbia soils diminished. In the seventh run plants survived in both these soils in cultures containing 2100 p.p.m. As_2O_3.

Extensive tests involving short toxicity series in 80 California soils showed that arsenic toxicity can be correlated with texture, being high in sandy soils and low in clays. The most notable exceptions to this generalization are found among the red soils, all of which fix much arsenic and, consequently, act like heavier soils.

Arsenic dosages for soil sterilization in California should be low on coarse gritty soils having little colloidal matter.

Loams, silt loams, and clay loams from acid igneous rocks, or in highly weathered condition from other rock sources, are in the intermediate toxicity range. Also in this group will occur light soils from basic igneous and sedimentary rocks. Clays from sedimentary rocks require heavy applications of arsenic.

The extreme fixing of arsenic by these latter soils may be avoided to a degree by light annual applications of soluble arsenic or by use of arsenic trioxide. (The term "fixation" as used in this work is defined as

meaning the reduction of availability or solubility and consequently of toxicity of arsenic due principally to reaction with soil constituents.)

Heavy leaching tends to reduce the concentration of available arsenic in the soil.

Repeated cropping of chlorate-treated soils resulted in continued loss of toxicity. Toxicity to the first crop was highest in Stockton adobe clay, second in Fresno sandy loam, third in Columbia fine sandy loam, and lowest in Yolo clay loam. By the seventh crop toxicities had shifted so that Fresno sandy loam stood highest, Columbia fine sandy loam second, Yolo clay loam third, and Stockton adobe clay lowest. Although fertility governs largely the initial toxicity of chlorate in soils, some other factor controls the change in toxicity with time and cropping.

The general relation of toxicity to fertility was confirmed. Soils giving marked deviations from the expected results proved in nearly every case to have come from arid regions and consequently, to be high in total salts.

Leaching and species susceptibility are known to affect chlorate toxicity. Under ideal conditions a schedule of dosages of from 1/2 to 4 pounds per square rod should give effective control of susceptible species, the dosages between these limits being fixed by the fertility of the soil. Under average conditions and against resistant species it should be doubled.

When chlorate dosage runs above 8 pounds per square rod the cost approaches that of carbon disulfide. Considering the loss of crops and the permanent effects of the saturation of the replaceable base complex with sodium, it seems desirable to use carbon bisulphide under these conditions.

A number of chemicals, including arsenic, chlorate, and carbon bisulphide, have proved useful in weed control. In a comprehensive program all should be used, each being applied under the conditions where it is most effective and economical.

RESEARCH WORK IN DENMARK

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Such institutions as the Danish State Experimental Stations, Danish State Plantbreeding Laboratorium, the Danish State Pathological Experimental Station, The Danish State Seed Testing Station and the Royal Danish Academy of Agriculture, all have a good standing in the international agricultural research work and within the country these institutions cooperate very closely with the practical work carried on by the common farmer.

Spread over the country are scientifically educated agriculturalists engaged with local experiments, agricultural evening courses keeping the farmers informed of anything new that might have been developed and supervising the farmers in their doings and keeping in close touch with the research