

VITAMIN E ACTION

Recent studies demonstrate the functions of vitamin E. Vitamin E prevents oxidation of fats, development of fat rancidity, and destruction of vitamin A in foods and feeds. In living cells it protects the tissues from damage by fat oxidation in their enzyme-containing elements.—*A. L. Tappel, Dept. of Food Science and Technology, Davis.*

Oxidation of a phenolic compound, apparently occurring in two steps when the catalyst of the reaction is an enzyme, is under study in the Department of Biochemistry, Davis.

COOLING SWEET CORN

Rapid cooling of sweet corn—from 80°F to 50°F in 24 minutes—has been obtained in the laboratory with shower-type equipment. Engineering studies show that the commercial submerger system, which cools the corn from 80°F to 65°F in 24 minutes, can be substantially improved by better agitation of water in the ice flume and in the corn submerger tank.—*R. L. Perry, Dept. of Agricultural Engineering, Los Angeles.*

ROOT ROT OF ALFALFA

The nutritional requirements of certain water molds, important causal agents of root rot—Phytophthora—of many crops may be important factors affecting the persistence or build-up of these fungi in soil. A study of the effect of nutrition on growth and sporulation of the fungus causing one type of root rot of alfalfa and other related species confirmed previous evidence that it has an absolute requirement for the vitamin thiamin. In soil, thiamin arises either from microbial synthesis or from root exudation, or both. The fungus cause of root rot of alfalfa did not grow in a thiamin-free synthetic medium when soil extracts or steam sterilized soil samples were added. However, growth of the fungus was excellent when the synthetic medium plus soil extract was fortified with 50–100 parts per billion of thiamin. Extracts from alfalfa roots contained more than adequate concentrations of thiamin as well

as other nutrients. Since competition for thiamin and other nutrients in soil may be of ecological significance and of importance to a better understanding of the persistence of the fungus in soil, and for working out improved control methods, further studies are being conducted.—*D. C. Erwin, Dept. of Plant Pathology, Riverside.*

SPINOSE EAR TICK

The sorptive dust Dri-Die 67, impregnated with 2% Dibrom, was effective in tests to control the spinose ear tick infesting horses, mules, and cattle. Each ear of the infested animals was dusted with ¼–½ ounce of the compound, applied with a hand duster deep into the ear. A number of the ticks were dislodged and immobilized shortly after treatment.

The dust had no adverse effect on the treated animals. Their ears still contained dust one week after treatment and remained free from ticks for at least 28 days. Subsequent dustings at varying time intervals kept the animals free from ear ticks.—*I. Barry Tarshis, Dept. of Entomology, Los Angeles.*

Avocado fruit is being used for a study of the role of acetate in the formation of fatty acids. The newly formed fatty acids and the probable regulatory function in plant cells of their stable derivatives are also under investigation in the Department of Biochemistry, Davis.

CATALYTIC ENZYME

The coenzyme thiamin pyrophosphate—synthesized by animals from vitamin B₁—serves as a catalyst in both plant and animal metabolism. It is one of the enzymes required for the formation of acetyl phosphate, an important compound used by animals for storage of chemical energy. Acetyl phosphate hydrolyzes to acetic acid and phosphoric acid with a large release of energy.

In the particular reaction under study, acetyl phosphate and 3-phosphoglyceraldehyde are formed directly from xylulose-5-phosphate and phosphate ion. If an acetyl thiamin pyrophosphate is formed and is able to react with phosphate ion to produce the highly unstable

acetyl phosphate, the acetyl thiamin pyrophosphate itself would have to be highly reactive. Although theory predicts that this would be true, nothing is known about the reactivities of acetyl thiazolium salts, of which acetyl thiamin pyrophosphate is a derivative.

Model acetyl thiazolium salts are being synthesized, to learn more about their reactivity toward phosphate ion and other substances, such as phenols and amines. If the compounds are sufficiently reactive to account for the formation of acetyl phosphate, the postulated acetyl thiamin will be a plausible intermediate. The properties of the model compounds will indicate how the intermediate acetyl thiamin pyrophosphate may be detected in biological reactions.—*Fred G. White and Lloyd L. Ingraham, Dept. of Biochemistry and Biophysics, Davis.*

The effects of handling and of transit conditions on market quality of artichokes are under statewide study by the Department of Vegetable Crops.

GRASS SEED CROPS

For most grass seed crops, random field samples of seed panicles provide a reliable evaluation of the progress of crop maturity. Grasses studied show that each species of grass grown for seed has an optimum percentage of mature ripe panicles—crop maturity percentage—at which maximum seed yields and minimum shatter losses can be obtained. When the crop maturity percentage is determined and harvests are regulated accordingly, seasonal variations in weather have less adverse effect and consistently higher seed yields result.—*D. C. Sumner, Dept. of Agronomy, Davis.*

CALIFORNIA AGRICULTURE

Progress Reports of Agricultural Research, published monthly by the University of California Division of Agricultural Sciences.

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