## BRIEFS

Continued

### Synthesis of the

## TOXIC COMPONENT

### in sorghums

Organic compounds labelled with radioactive carbon were used to trace the metabolic process whereby sorghums convert the amino acid tyrosine, a common constituent of proteins, into a toxic glycoside. During the digestion of young green sorghums eaten by livestock the glycoside is broken down to yield glucose, an aromatic aldehyde, and the respiratory poison hydrogen cyanide, which can cause immediate death.—*Eric E. Conn, Dept. of Biochemistry, Davis.*

## SPROUTING OF CHAMISE

### in relation to regrowth

The sprouting of brush on California ranges is important whether the objective of brush management is conversion of a brush cover to grass or the stimulation of browse. In either case an understanding of the sprouting response is needed to guide control practices. A study was undertaken to determine whether detectable physiological changes in brush species may be related to sprouting behavior.

Little basic information is available on the sprouting of those brush species which are found on western ranges. Studies of woody species, mainly in the east, reveal a pronounced seasonal pattern in vigor of regrowth following cutting or burning. This pattern may reflect a food reserve status of the plant similar to the close relationship demonstrated in herbaceous forage plants between stored reserves and persistence, overwintering, and regrowth.

A native stand of chamise was selected for initial study at the Hopland Field Station. Deer are excluded from part of the experimental area while the rest is subject to heavy browsing. Brush areas have been cut near ground level periodically around the calendar. At each cutting, samples of stem, crown, and root tissues are taken for analyses of carbohydrate and nitrogen fractions and of certain elements. Twig moisture, soil moisture, temperature, and precipitation records are maintained. Regrowth of tagged sprouts is measured following each cutting.

The most pronounced seasonal trend revealed to date is that of starch, which on a dry weight basis is 8%–10% higher in late winter than in midsummer. Reduction in starch content is greatest when growth is most rapid. Heavily browsed plants are lower in starch than protected plants, and vigor of sprouting tends to increase in plants possessing greater reserves. Studies are planned to evaluate the reliability of starch reserve as an indicator of sprouting potential.—*Horton M. Laude and Milton B. Jones, Dept. of Agronomy, Davis.*

### Phenol compounds in

## INCENSE CEDAR

Some phenol compounds of relatively simple structure—such as carvacrol and para-methoxy-thymol—identified in incense cedar heartwood, definitely slow down the growth of rot producing fungi. Nontoxic phenolic compounds of more complex structure—libocedrol, heyderiol, and others—apparently are formed in wood by oxidation of the toxic compounds. Decay in the center of a tree suggests that any substances toxic to rot producing fungi had been here completely oxidized.—*Eugene Zavarin, Forest Products Laboratory, Berkeley.*

### Certain desert plants wage

## CHEMICAL WARFARE

### against competing plants

Examination of areas adjacent to the scraggly desert plant *Thamnosma montana* reveals a zone of ground completely devoid of competing plant life. Plant physiologists in cooperation with organic chemists have discovered that this plant and several others excrete a substance from their roots that is toxic to other plants. These phytotoxic substances have been characterized as relatives of a chemical class known as coumarins. Not just any coumarin will do the job, however, and recent investigations have shown that very special modifications of the coumarin molecule are necessary in order to show phytotoxic activity.

Investigations at Davis have been directed toward finding what structural modifications of the coumarin molecule must be made to inhibit germination of radish seedlings. The parent compound itself, coumarin, is especially effective in preventing radish seedling germination, and in proper concentrations can cause stunting of plants and discoloration of leaves. Addition of only one carbon atom to the coumarin molecule can almost completely destroy this remarkable activity. Further investigations were made of a whole series of these compounds, and the relationship to molecular structure and phytotoxic activity investigated. The subtle interrelationships involved in this investigation present to the agricultural researcher, among other problems, the possible use of such compounds as selective weed killers.—*Richard A. Bernhard, Dept. of Food Science and Technology, Davis.*

### Biological studies of

## RODENT PESTS

### of agriculture

Current research on the biology and control of the pocket gopher, a major agricultural pest in California, includes studies on the endocrine glands of these burrowing animals, particularly as they relate to density and dispersal of gopher populations. Besides the intrinsic value of such biological studies, the information obtained may lead to new or improved methods of eradication. The adrenal glands are being studied first since there is evidence that changes in the amount of hormones secreted by the adrenal cortex—outer rind—may be associated with cyclical fluctuations in animal populations. Stresses of various sorts result in increased secretion of cortical hormones to help the animal cope with the emergency. Prolonged stresses may eventuate in major population decline. Gophers adapted to living a secluded life in burrows with little or no environmental stresses may not have the necessary cortical lability to adapt themselves to sustained stress. Under active investigation are seasonal cycles and comparative sizes of adrenals between sexes and between gophers and other species such as moles, meadow mice, house mice, bats and squirrels. Adrenal responses of coast range and central valley pocket gopher populations are also being compared. Natural environmental stresses under study include seasonal changes, population density and composition, and agricultural practices. Several stress-inducing factors, including pairing of various kinds of individuals in cages, are being tested under controlled laboratory conditions for comparison with field results.—*R. L. Rudd, Dept. of Zoology, Davis.*