Control of the

VINEGAR FLY

Three aspects of crop protection against the vinegar fly are under investigation: the effectiveness of poison baits in the field, a search for chemicals that will repel vinegar flies, and development of chemical control in vineyards and fig orchards.

The studies are concerned with the vinegar fly problem which involves infestation of fruit and vegetables, contamination, spoilage, and spread of plant pathogens. Vinegar flies are carriers of the watery rot disease of tomatoes, lay their eggs on canning tomatoes, contaminate grapes brought to the wineries, infest raisins, figs, and other dried fruits. The flies also are carriers of souring organisms of figs, Rhizopus rot of peaches, and brown rot of stone fruits. The tightening of working tolerances on egg and fly contamination makes new research approaches to satisfactory fly control mandatory.—*E. M. Stafford, Dept. of Entomology, Davis.*

Embedding media for

ELECTRON MICROSCOPY

Studies in mineral nutrition of vegetable crops using electron microscopy require an embedding medium suitable for plant materials. Methods employing acrylic plastics and epoxy resins, primarily devised for animal materials, are not satisfactory when used on some plant tissues. Current experiments on new formulations of epoxy resins and methods of infiltration into plant tissue have given promising results.

Use of the new procedures in electron microscopy will permit observations on the effects of mineral deficiencies, such as boron, zinc, and iron, on the fine structure of the cell walls and protoplasts. This information will help to clarify the role of mineral nutrients in the plant and provide more refined methods of diagnosis.—*Arthur R. Spurr, Dept. of Vegetable Crops, Davis.*

Effect of environment on

RICE PLANTS

Environmental factors that affect growth of rice plants include air, water, and soil temperatures, light intensity, and photoperiod—daylength.

These factors are being studied at the Rice Experiment Station at Biggs, and in the laboratory at Davis. To determine the effect of water temperature, plants are being grown in concrete cylinders through which temperature-regulated water is circulated. Temperatures under study range from 65°F. to 100°F. The effects of cold air, soil, and water on the growth of rice seedlings are being studied in a refrigerated chamber. The seedlings are subjected to 60°F. for 30 days. Tolerance to this cold, and subsequent recovery when transplanted to the field are being evaluated. Light intensity effects are being determined by means of frames covered with shade cloths of several densities. In photoperiod studies, potted rice plants in laboratory chambers receive an exact daylength controlled by lights and time clocks. Small laboratory chambers are also being used to study the effects of light intensity and temperature on respiration and photosynthesis of rice plants.

These investigations will provide material for study of the physiological processes of the plant which are affected by environment. They should also aid in recognition of the most tolerant and best adapted rice strains. Strains with outstanding characters of tolerance to environmental extremes may be discovered and in turn utilized in plant breeding programs.—*Douglas P. Ormrod, Dept. of Agronomy, Davis.*

Moderate grazing protects future

FORAGE PRODUCTION

Forage production from annual-type range vegetation depends to a large extent on the amount of dry-plant material —mulch—left ungrazed at the end of the dry season. At the Hopland Field Station, plots from which all the mulch had been removed in September each year produced about one-third the forage produced on plots where adequate mulch remained. Without mulch the next crop was likely to consist mostly of small varieties of grasses and unpalatable annual weeds. Desirable species—including soft chess, wild oats, and filaree—were promoted with ample mulch. Where less than 700 to 1,000 pounds of plant material per acre was left, rapid deterioration of the forage resulted.

A previous experiment left open the question whether the results were due to the amount of mulch or to stubble height, because some plots were clipped at various heights. For the last three years a new experiment has allowed the separate evaluation of effects due to height of stubble and amount of material. Preliminary results indicate that higher stubble height with the same amount of mulch promotes better range forage than lower stubble.

The experiment indicates that ranges should be grazed moderately to ensure that the next forage crop will be composed of the best kind of plants and as large as the climate and soil will permit. That stubble height is important suggests that grazing animals should be allowed to select the nutritious leaves and to avoid the less valuable stems. Such grazing can be accomplished more easily with a small number of animals grazing for long periods than with large numbers of animals in a pasture for a short time.—*Harold F. Heady, School of Forestry, Berkeley.*

Corrosion of

ALUMINUM IRRIGATION PIPE

Frequently aluminum pipe used for irrigation becomes severely pitted or even perforated from corrosion, after a few months of use. In one case, samples of water were taken from an irrigation system; one sample taken at the well and the other after the water had passed through 1,000′ of aluminum irrigation pipe which had become badly corroded during four months use. The water at the well was found to contain thirty parts per billion of copper, the water at the end of the sprinkler system had only two parts per billion. Copper in the water was replacing the aluminum and was responsible for the corrosion.—*John L. Voth, Dept. of Chemistry, Davis.*

Chemical regulator of

PLANT GROWTH

Studies are under way to explore the process by which coumarin, a constituent of many higher plants, is formed and how it affects plant growth. Coumarin is especially abundant in white sweet clover, where it was indirectly responsible for a hemorrhagic disease of cattle in the midwest. It has the odor of newmown hay and for this reason is important for the perfume industry. Of greatest interest, however, is its ability to stimulate and inhibit plant growth. Experiments are being designed to throw light on the process by which this compound is biosynthesized in the plant and its various metabolic routes.—*Eric E. Conn, Dept. of Biochemistry, Davis.*