

as the fertilizer to avoid the complication of ammonium fixation. Nitrogen uptake by a succession of seven cuttings of sudangrass, grown over a period of nearly two years, is shown in table 3.

TABLE 3. PERCENTAGE OF UPTAKE OF FERTILIZER N BY SEVEN CUTTINGS OF SUDANGRASS

Crop	Percentage of added fertilizer N	
	No residue	2% straw
1	52.4	10.9
2	6.7	5.2
3	1.4	2.5
4	0.6	1.4
5	0.4	1.4
6	0.2	0.7
7	0.1	0.9
Total	61.8	23.0
Roots	12.8	4.9
Remaining in soil	22.8	72.0
Lost	2.6	0.1

Where straw residue was applied, nearly three-fourths of the fertilizer nitrogen remained in the soil at the end of the experiment. Even without the addition of straw more than one-fifth of the fertilizer nitrogen remained in the soil. It is also interesting to note that the bulk of the nitrogen in either case was absorbed

by the first crop. The second crop absorbed only 5 to 6 per cent, and very little nitrogen was released thereafter. These results suggest that nitrogen immobilized in the decomposition of carbonaceous crop residues becomes progressively less available as time goes on and may not be mineralized for many years.

### Handling crop residues

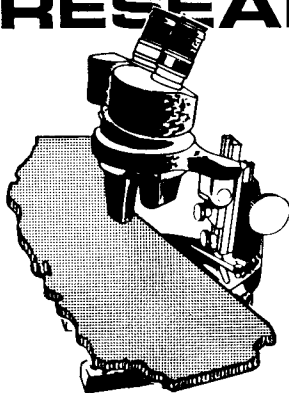
One of the main problems with crop residues is the possible interference with tillage, fertilizer injections, or planting. One of the best ways to avoid these problems is to use stalk shredders and early incorporation of the residue to start the decomposition process. If this is done immediately after a timely harvest, there is usually sufficient soil moisture to start decomposition. Under normal practices, these partially decomposed, finely chopped residues will not interfere seriously with the planting operation. The fine shredding and early incorporation may also be helpful in certain insect and

disease problems. If the succeeding crop is to be planted shortly after residue incorporation, nitrogen should be applied in a preplant treatment or in a starter fertilizer to provide ample nutrients for the crop, particularly during the seedling stage.

Where very large amounts of residues are present, or certain insect problems exist, it may be desirable to apply nitrogen to promote more rapid decomposition, but such an application should not be regarded as contributing materially to the nitrogen requirements of the crop.

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## RESEARCH PREVIEWS



A continuing program of research in many aspects of agriculture is carried on at University campuses, field stations, leased areas, and many temporary plots loaned by cooperating landowners throughout the state. Listed below are some of the projects currently under way, but on which no formal progress reports can yet be made.

### BLACK ROT IN SPROUTS

The bacterium *Xanthomonas campestris*, causing the black rot disease of crucifers, has been isolated for the first time from California brussels sprouts by plant pathologists at Davis. Black rot bacteria are seed-borne and as yet have been found in California only in association with foreign-produced seed lots. Seed-borne bacteria were found present in lots of variety Jade Cross and subsequently in the field-grown plantings. Control of the black rot disease is obtained by use of disease-free seed.

### PIERCE'S VIRUS IN ALFALFA

The possibility of seed transmission of dwarf disease (Pierce's virus) has prevented export of California-grown alfalfa seed to a number of countries. Plant pathologists at Davis grew over 4,500 alfalfa plants using seed from heavily diseased plants. The experiment was made in an isolated area and no case of seed transmission of the disease could be found in subsequent plantings.

### SPACING BEET FIELDS

Plant pathologists at Davis have determined the distance beyond which the viruses causing beet mosaic and beet yellows in sugar beet cannot be carried by normal means.

### GROCERIES ON CREDIT?

Agricultural economists at Davis are studying the possibility of retail grocers (including the big food chains) adopting a credit card system as a form of non-price competition in the sale of foodstuffs. Of major importance is the impact such a system would have on food retailing.

### PESTICIDES IN FORESTS

The use of pesticides to control forest insects may be having unintentional side effects. Just how the insecticides may be changing the normal life patterns of birds, desirable insects, and foliage is the subject of a study by specialists of the University, State Department of Fish and Game, and the U. S. Forest Service.

### AERIAL POLLINATION

Agricultural engineers working out of Riverside are experimenting with aerial pollination of dates, using helicopters and ground level blowers with extended nozzles. Being tested are different frequencies and rates of application, with an evaluation of effect of temperatures during the pollinating season.

### ORNAMENTAL IMPORTS

Specimen trees of the genus *Callitris* and some outstanding *Eucalyptus* varieties have been planted and are being studied by ornamental horticulturists at Davis, with a view to introducing variations in landscape plantings that could be adapted for a great many effects.