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RICE STAND ESTABLISHMENT. Leaflet 196. Gives description of all necessary steps important in rice growing, from preparation of seedbeds through fertilizing procedures, seeding and reseeding techniques, to water management and controlling pests and weeds.

# BED MULCHES FOR STRAWBERRIES

• • • *petroleum*

• • • *polyethylene*

• • • *combinations*

VICTOR VOTH • H. J. BOWEN, JR. • FRANK TAKATORI

Clear polyethylene proved superior in these tests as a mulching material for strawberries in comparisons with colored polyethylene and petroleum mulch.

**C**LEAR POLYETHYLENE has been widely used for mulching in California strawberry production since 1957. Because polyethylene does not deteriorate and must be removed before the soil can be prepared for the following crop, experiments were conducted during 1964 and 1965 to compare *petroleum* mulches with *polyethylene* mulches.

### Petroleum mulch

Petroleum mulch is a water emulsion of petroleum resins and forms a black film when sprayed on the soil—becoming an integral part of the soil surface. The application and handling are relatively simple, and the film disintegrates in a few months when incorporated into the soil by cultivation.

Preliminary experiments, completed in 1964, determined the amount of petroleum necessary to maintain a film seal for one growing season on winter plantings. Application rates ranging from 500 to 1000 gallons per acre were compared. Approximately 80% of the total surface area was covered, leaving the bottom of the furrows clear. Freshly harvested high-elevation plants of cultivars Fresno, Lassen, Tioga, and Torrey were planted November 18, 1963, at the South Coast Field Station, Santa Ana. The asphalt

mulch was applied November 19, before any growth started. The clear polyethylene mulch was applied November 25. Single row, 28-inch beds were used with a basic plot size of 10 plants. Each treatment was replicated six times for each variety. The data obtained from both 1963–1964 and 1964–1965 studies showed the 1000-gallon rate gave the best yield results and maintained the best soil coverage. The experimental design in 1964–1965 was the same except that black, gray-smoked, and clear polyethylene treatments were compared with non-mulched checks on double-row 40-inch beds.

### Temperatures

In 1963–64, the temperatures were recorded at both the 1/2-inch depth and the 2 1/2-inch depth at 2:00 pm from December through March. Only the 2 1/2-inch measurement was recorded during 1964–65 because the average temperature at that depth appeared to correlate more closely with changes in the production pattern.

There was no evidence of damage from petroleum mulch in the winter plantings and the stands were just as good as non-mulched or poly-mulched plants. However, weeds germinated and the seedlings



Left photo: strawberry mulch test plots with (left to right) nonmulched, petroleum, clear polyethylene, and petroleum-poly combination mulch. Right photo: nonmulched, black, gray-smoked and clear polyethylene mulch test plots.

grew through the petroleum mulch readily. Furthermore, any disturbance of the surface (walking on, hoeing, etc.) destroyed the seal and ruined the surface.

Since all of the varieties behaved the same over all treatments, the results were pooled for presentation in the figures. For both years, early yields were correlated with the average temperatures at 2½ inches and the differences are significant. In the 1964 harvest, differences in total yield were not significant and this is consistent with most results in earlier experiments. In the 1965 harvest, the nonmulched treatment total yield was significantly less than that for the mulch treatments.

In general, the treatments producing the most early fruit (March and April) produced the least amount of June fruit,

and the most early runners. For example (in 1965), the nonmulched plants averaged about three runners per plant and produced almost twice as much fruit in June as the combination petroleum-poly-mulched plants, which averaged about nine runners per plant.

Similar comparisons on summer plantings were attempted during the 1964-65 season with plants set August 1, but 73% of the petroleum mulched plants were dead one week after the mulch was applied. Evidently, petroleum mulch cannot be safely used when ambient air temperatures are 80° to 85° F (27°-29° C). Since temperatures this high are common in all growing areas in the summer planting season (July to September), petroleum mulch cannot be considered.

In summary, while petroleum mulch

enhanced earliness of production in winter planted strawberries, it was not competitive with clear polyethylene mulch, and the disadvantages appeared to outweigh the advantages. The gray-smoked polyethylene mulch was superior to black poly or no poly. However, clear poly was superior in stimulating desirable performance responses and for inhibiting weed seed germination and growth.

*Victor Voth is Research Specialist, and H. J. Bowen, Jr., is Senior Laboratory Technician, both of the Department of Pomology at Davis and stationed at the South Coast Field Station, Santa Ana. Frank Takatori is Associate Specialist, Department of Vegetable Crops, Riverside.*

Graph below compares early yield (March-April) and late (May-June) and the associated average 2:00 p.m. soil temperatures at the 2½-inch (8 cm) depth for 1964 and 1965 and ½-inch depth for 1964 (broken line) involving petroleum (asphalt), clear polyethylene, and combination mulches and nonmulched treatments at Santa Ana. Graph right compares early, March-April (solid), and late, May-June (open) 1965 harvest involving polyethylene mulch treatments.

