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UNIVERSITY OF CALIFORNIA
DIVISION OF AGRICULTURAL SCIENCES
AGRICULTURAL EXPERIMENT STATION

PROJECT No. 1686
REPORTED BY A. B. Carlton
Project Leader
Davis: Soils & Plant Nutr
Campus and Department
DATE December 1, 1963

Annual Summary Statement of Progress for year ending Dec. 31, 1963
This Summary is in addition to, not in place of, more complete reports of progress prepared periodically and at least once a year with a deadline of Feb. 1.

Title: Peat Land Conservation and Peat Dust Abatement

Personnel: Alan B. Carlton and cooperating research and extension staff

Principal results of year: Dust storms were monitored and the numbers, intensities, and distribution throughout the year were compared with previous years. This was the first year in the history of the project in which 100% of the asparagus acreage in San Joaquin County subject to serious wind erosion and amenable to inter-row planting was effectively interplanted. Analysis of the dust storm data along with rainfall and wind intensity records indicates that the extensive inter-row planting program was highly effective in reducing the number and intensity of dust storms. Only 10 dust storms from westerly winds were recorded compared to an average of 33 and a minimum of 22 for the first six years of the project in which no dust control measures were used. More important (from the stand point of soil loss and dust nuisance) than the reduction in total dust storm is the reduction of the more intense storms. No severe dust storms occurred in 1963 although the six year average prior to inter-row planting is 4.5 per year with a minimum of 3. The figure for moderate storms during those years is 6 per year with a minimum of 4. There were only 2 such storms in 1963. This very considerable reduction in dust storm intensity was obtained despite weather records which show that rainfall during May and June (the dustiest months) was not abnormal or unusually distributed and the frequency of high velocity winds was considerably above average.

Over 16,000 acres of white asparagus in San Joaquin County were interplanted with barley in accordance with methods developed under this project. The growers experienced less difficulty than in previous years and a very high percentage of the interplanting were grown to an effective height. Barley volunteered in asparagus fields as a result of inter-row planting in 1962 was controlled more satisfactorily than in the past as a result of recommendations based on the experience of 1962 and previous years.

Variety trials for finding more suitable inter-row plants and annual windbreaks were continued. No variety tried was superior to presently recommended varieties but Sierra oats was found to be an adequate substitute, especially on highly acid soils where barley does not thrive. It was concluded, after several years of trials, that warm weather varieties (eg. corn, sorghums, sudan grass, rice, etc.) are unsuitable for use in dust control methods in the Delta because they are unable to grow to sufficient height during the period they are most needed--May and June.

As a result of exploratory trials last year in the use of herbicides to control the volunteering of barley in interplanted asparagus, the use of dalapon was explored further (turn page)

Publications:

INTER-ROW PLANTING IN BRIEF by Alan B. Carlton

INTERPLANTING METHODS FOR WIND EROSION PROTECTION IN SAN JOAQUIN ASPARAGUS.
H. B. Schultz, A. B. Carlton, and F. Lory. California Agriculture Vol. 17, No. 9
1963.

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It was sprayed on the green interplanted barley at various rates and several stages of barley maturity. Barley germination was inhibited when plants were sprayed any time between 10% emergence and soft dough stage. Rates as low as 4 lbs. per barley acre (1/2 lb. per asparagus acre) showed some inhibition but rates of 16 lbs. per barley acre were required for reasonable volunteer control (volunteer about 10% of normal). Asparagus samples, harvested over a period of a month following spraying of barley with dalapon, were taken for residue analysis.

Wind velocities behind eucalyptus tree windbreaks in the Salinas valley were studied to elucidate certain points in windbreak design. A series of 'breaks at spacings of 10 tree heights has a vastly different wind velocity pattern than that for a single windbreak. Whereas with a single 'break, velocities increase continuously at successively greater distances downwind, velocities between two 'breaks decrease, reaching a minimum just a short distance in front of the downwind windbreak.

Late in 1962, flat perforated plates were inserted into undisturbed and reconstituted peat soil profile at various depths down to 5 ft. Their relative elevations were measured for the remainder of 1962 and in 1963 to study the relative importance of different parts of the soil profile in the phenomenon of peat soil subsidence. Main result to date is the discovery of an essentially irreversible expansion of the soil profile throughout a depth of 5 ft. when the water table is raised to near the surface. Different cultural treatments were begun late in the year to determine the effect of cultivation on subsidence.

Plans for 1964 include:

- 1) Continuing monitoring of dust storms.
- 2) Continuing work with inter-row planting program in the Delta, particularly evaluating new techniques tried.
- 3) Expanded variety trials, especially with promising varieties for inter-row planting.
- 4) Further trials of dalapon and 2,4-D for use in inter-row planting volunteer control, using wider range of concentrations and stages of grain growth.
- 5) Search for methods of dust control practical for asparagus in beds of less than 7 ft. width.
- 6) Continuing the study of subsidence by means of buried plates in a peat profile.
- 7) Measure the surface elevations of three delta islands whose change of elevations has been followed since 1922.
- 8) Expanded studies on multiple windbreaks begun this year.
- 9) Temperature and heat flow in peat soils will be studied in late winter and early spring to assist in finding ways of warming these soils earlier in the spring.

Form B will be prepared