It was found that wind breaks best protected the dunes from moving when installed in front of the ridges rather than on top. Our experiment doesn't show this advantage. The anemometers nearest to the fence recorded higher speeds than in the lower part of this diagram for ridge mounting of the fence. Furthermore, the disadvantage of lowering the height of the fence to 3' would be much greater anyway, as can be seen in figure 4 where all four curves are plotted by using the absolute distances of the anemometers from the fences.

The most encouraging picture of all is the lower part of figure 3 showing reasonably good protection in perpendicular wind. However, the upper part of this figure shows the decrease of protection with turning wind--a factor that occurs to a much lesser amount in the case of interplantings, which was stressed in the 1959 report in the California Agriculture.

effectiveness in depth. A secondary setup was the installation of a fence in a furrow which diminished its height above the ridges from 4' to about 3'. Only one snow fence type of 60% perviousness was available; but, by a two layer mounting, a 30% perviousness was obtained as alternative.

In the lower part of figure 3 the difficulty of drawing the curves can be seen by the previously discussed scattering of the recorded data. Explanation can be given for the two offset points next to the fence. The triangular point, obviously very low, is due to a broken and partly missing slat next to the anemometer. This trouble was recognized too late and apparently was repaired too well so that in the following test periods, with a double-fence arrangement, this spot was protected too much (encircled point). Another pair of points (in parenthesis) had to be disregarded, also. The anemometer there must have been at a position to the ridge slope that increased the velocity considerably. In spite of all this, the pair of curves, each an average of three runs in wind perpendicular to the fences, looks reliable. The protection in both cases is as good as should be expected, ending at about 25H. The velocities at the measuring point nearest to the fences are cut down to a considerable degree--to 37% and 47% of the velocity at the control station, which was at the upwind side of the fences. The difference between the two curves is not so large as to justify the expense of a double fence, in case the economic side had to be considered. A similar result was found in later tests behind snow fences on the Davis Campus.

In the second setup of a snow fence in a furrow between two asparagus ridges, basically no different picture should be expected in the upper part of figure 3, in case the wind had been perpendicular to the fence, because the height of the fence above the ridges (H = 3) was used as dimension for distance. But no perpendicular winds occurred and the protection had smaller amounts. The main objection of testing this setup, however, was to check [illegible] wind tunnel on [illegible].

Form B-11m-30,'58(7977)

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Davis - Ag. Engineering
Campus and Department

DATE December 31, 1959

The poorly developed barley interplantings occasionally had spots of well grown plants--patches of 20' by 20' in size. The measurements made behind such a patch are included in figure 2. This diagram impressively shows the previously found protective efficiency of the interplantings. The figures in parenthesis at each point are the number of hourly periods used for averaging. Winds perpendicular to the rows got a reduction of 30% by the poor and nearly 50% by the good stand of barley. For wind directions near parallel to the rows, the reduction is almost as good in the poor barley stand. But, in the good stand, the protection obviously fell to values obtained in the poor stand. This might be explained by the fact that the anemometer did not get any benefit from the good stand because in such directions it mainly "saw" the poorly grown barley. Practically no data were registered, unfortunately, for the WNW-direction, so that there was no chance for verifying the previous results indicating better protection at such wind angles than at the perpendicular one.

The data for perpendicualr wind were further used for investigating a possible daily cycle. They showed higher percentages of normal wind--meaning less protection--in the early afternoon. But the range between high and low values was small in both stands.

Time:	Mid-night	3 A	6 A	9 A	Noon	3 P	6 P	9 P	Mid-night
% of Normal Speed									
In Good Stand	54	53	52	55	57	59	57	55	54
In Poor Stand	71	70	70	70	72	74	74	73	71

The anemometer installation at 1", as described before, was further used for testing of snow fences. An operation recorder was registering the velocities on 7 ridges up to a distance H = 24 on the lee side of the fences. H, being the height of the fence, was used as dimension for distance. Only snow fences of 4' height were tested--each section 100' long. In the first part of the testing they were installed on the ridges, thus giving them the maximum possible height and, therefore, optimum

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TITLE: PEAT LAND CONSERVATION AND PEAT DUST ABATEMENT

Effectiveness of Various Wind Breaks in Asparagus Fields at Terminous

PERSONNEL: Herbert B. Schultz and Alan B. Carlton

In the two previous test seasons, the problem of determining effectiveness of erosion control methods was treated by calculations with data obtained from vertical wind profiles. This year, wind velocities at 1" above the asparagus ridges were measured because verification of some of the previous results was desirable, e.g., of the amazingly good protection from interplantings for parallel wind which was almost as good as in wind directions perpendicular to the rows. As for snow fences, their protection, though reasonably good above the surface, had apparently been too little near the surface.

The testing in interplantings was handicapped in 1959 because of poor growth due to the spring drought. The installation of the anemometers was made (Fig. 1) by sinking them into the ground until the lower tips of the cups were at 1" in height. The shape of the ridges influenced seriously the air flow as can be seen by the scattering of points in figure 3. Therefore, during the test period of the crop (in June) in interplantings, duplication of test stations and frequent exchange of anemometers was practiced in order to cancel out errors possibly caused by different ridge shapes (slope angles). Continuous recording was another means for enhancing the confidence by providing [illegible] of data. Four California Spot Climate Recorders had been [illegible] purpose. A fifth station, the Terminous wind survey [illegible], furnished the wind directions, and its 6' high [illegible] served for selecting the suitable data, as hourly periods with less than 15 mph were omitted.