Form C-10m-10,'57(171)

UNIVERSITY OF CALIFORNIA
COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATION

PROJECT NO. 1686

REPORTED BY H. B. Schultz

Davis - Ag. Engineering
Campus and Division or Department

DATE December 31, 1959

Annual Summary Statement of Progress for year ending Dec. 31, 1959
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: H. B. Schultz and Alan B. Carlton

Principal results of year: This year's field tests of erosion control methods were carried out with anemometer installations at 1" height over asparagus ridges. Various locations near Terminous in bare, interplanted, and wind break protected fields were compared. The data showed considerable scatter due to existing (but hardly noticeable) varying ridge conditions (degree of flattening at their tops), but conclusions still could be drawn. Well grown interplanted barley strips provided nearly 50% protection and 30% protection was recorded in poorly grown stands in perpendicular wind. In wind directions near parallel to the ridges and barley strips, the protection was decreased but little; a corroboration of previous findings that were obtained by calculation utilizing vertical wind profiles. For wind breaks testing, snow fences (wire-woven slats, 4' long) were used. The results were somewhat contrary to the tests two years ago, perhaps caused by different location of the anemometers with respect to the asparagus ridges. Under this year's arrangement, the protection extended well to a distance of 20 times the wind break height, which is as good as the experiences elsewhere for perpendicular direction. The snowfence in this case was installed on a ridge. Certain advantages expected from installation in a furrow did not materialize. A rather large disadvantage developed instead due to the reduction in height of the fence above the ridges from 4' to about 3'.

The wind survey with California Spot Climate stations during the dust months (April through September) furnished similar results as in previous seasons except for a greater than usual number of very strong velocities in May. This month has had the maximum in every year so far, but never as pronounced as in 1959. Especially on three days early in the season the westerly monsoon breezes reached extremely high velocities of long duration (9 hours) at Terminous. Another station on Rindge Island had to be discontinued because of poor caretaking, but a new location on Bacon Island was tried and found promising for next season operation.

Publications: Field wind breaks for row crops. California Agriculture, Vol. 13, No. 11 (1959)

(If more space is needed, use back of this sheet.)

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SKETCH OF ASPARAGUS RIDGES WITH INTER-ROW PLANTING OF TWO ROWS OF BARLEY PER STRIP.

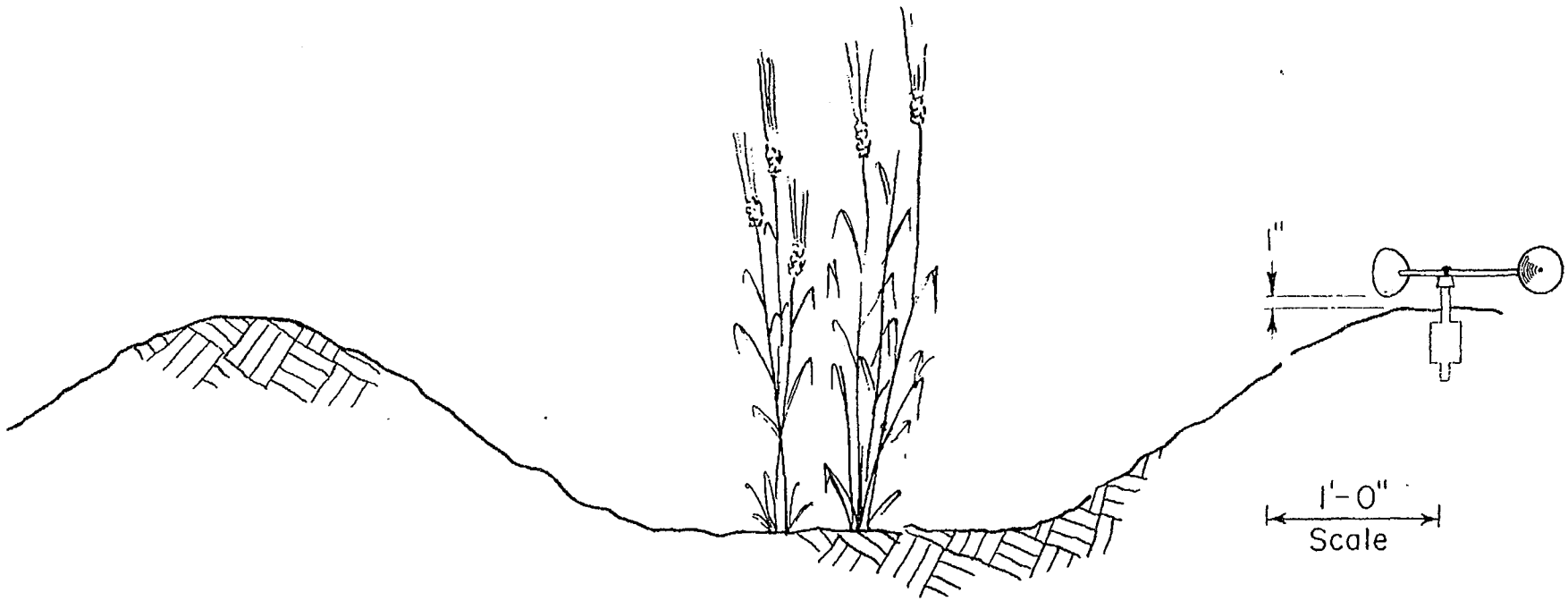
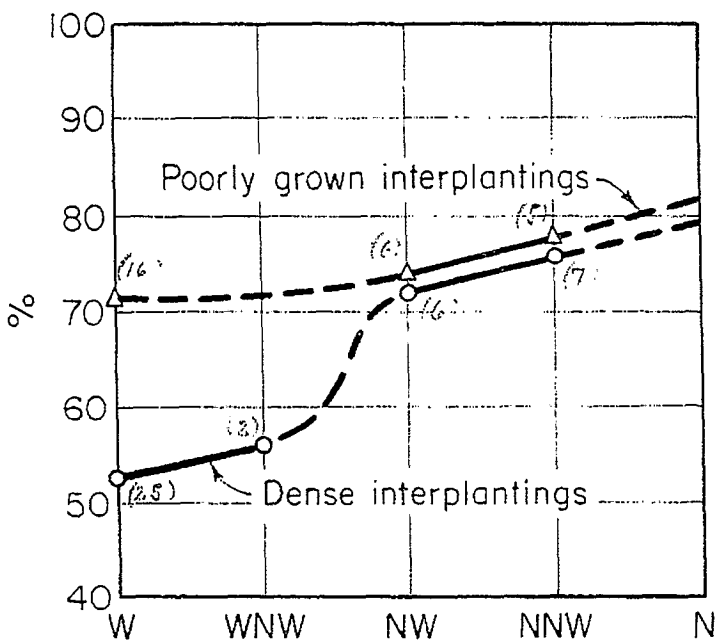


Fig 1.

Fig. 2



Wind velocity over interplanted ridges in % of velocity over non-interplanted ridges, all anemometers 1" above ridges.
W-wind is perpendicular, N-wind is parallel to the ridges.

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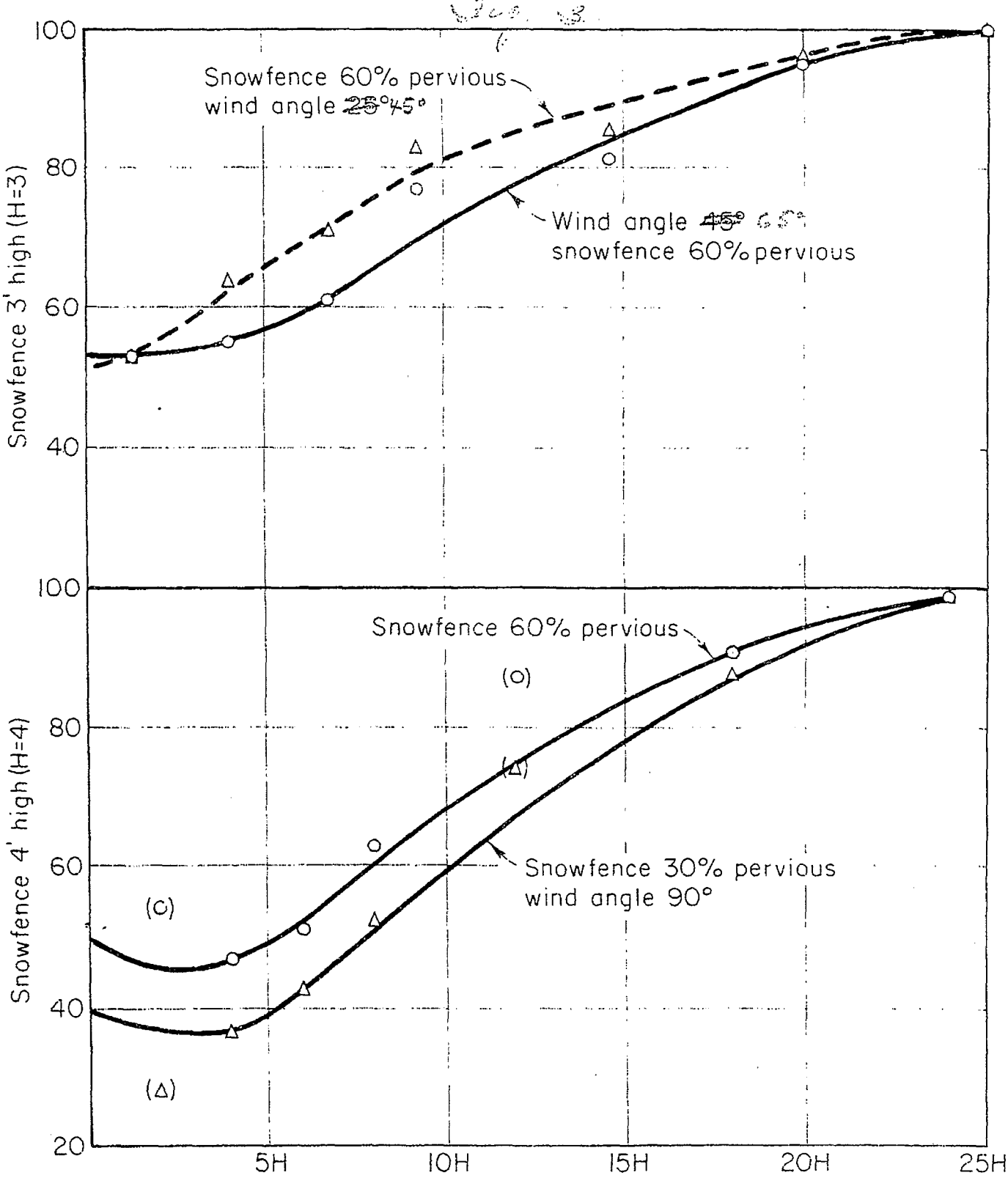

Wind velocities behind snowfence in % of outside velocity at distances determined by the height of the snowfence anemometers 1" above asparagus ridges.

Figure 3

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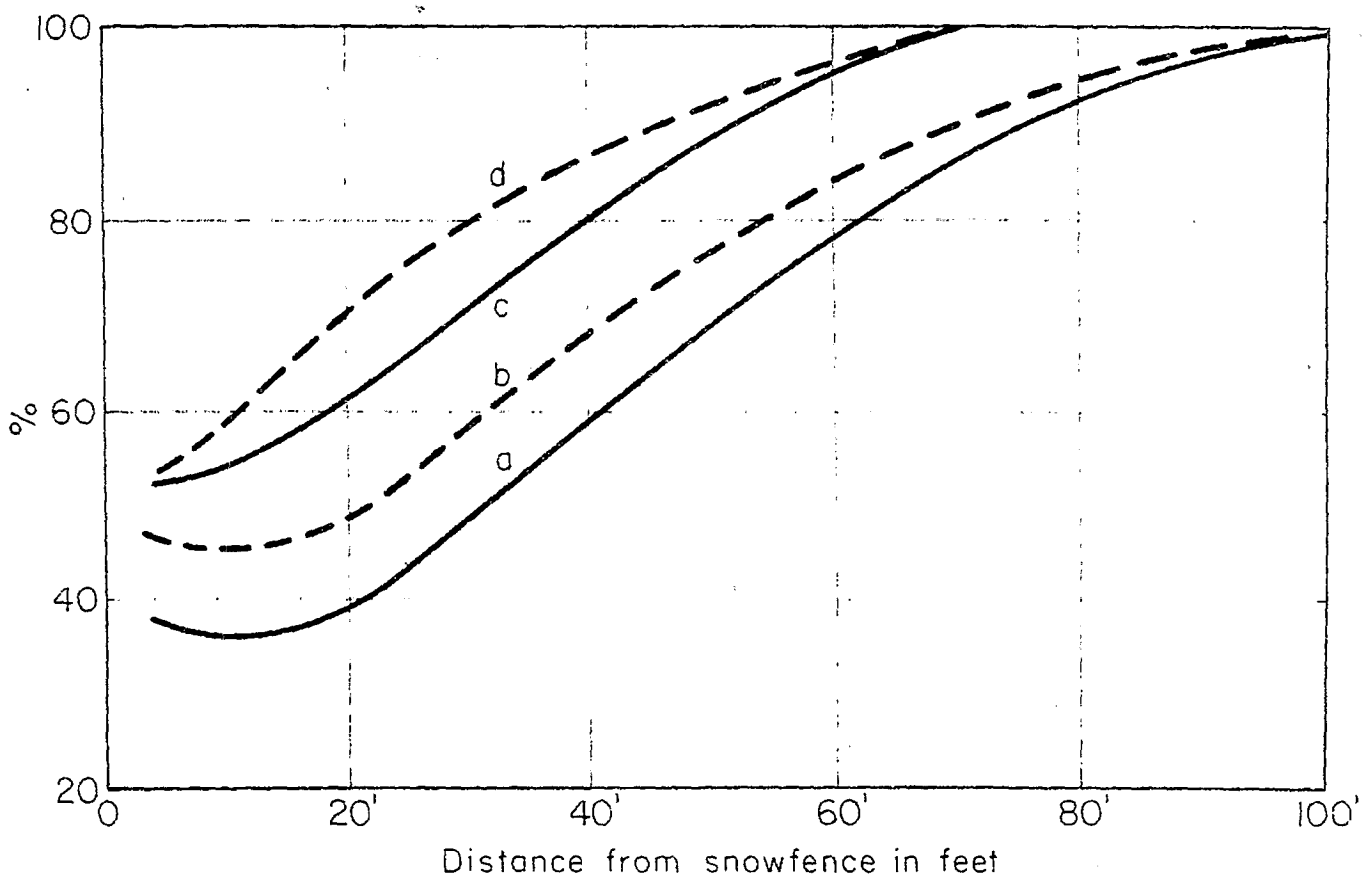
Fig. 4.



Wind velocities behind snowfence in percent of outside velocity
All anemometers 1" above ridges
Terminous, 1959, asparagus field.

a. Wind angle 90°, snowfence 4' above ridge, 30% perviousness
b. " " 90°, " 4' " " 60% "
c. " " 65°, " 3' " " 60% "
d. " " 45°, " 3' " " 60% "

Form B-15m-10,'50(L600)

UNIVERSITY OF CALIFORNIA
DIVISION OF AGRICULTURAL SCIENCES
AGRICULTURAL EXPERIMENT STATION

PROJECT NO. 1606 PG. 2
REPORTED BY M. B. Schultz
Davis - Ag. Engineering
Campus and Department
DATE December 31, 1950

For the wind survey in the delta area west of Stockton in the 1950 dust season, the spot climate station at Terminous proved the most reliable. Stations also were installed on Ridge Island and on Bacon Island. The Ridge station, however, had to be taken out early in the season because of inconvenience to the cooperator in providing reliable caretaking. The Bacon Island station was operated on a trial basis from June 2 to September 15 to test possible differences vs. Terminous and also the interest of the new cooperator there. Results were encouraging so that a full season installation is planned for next year.

For reasons of continuity, the evaluation of the recordings is compiled in Tables 1 through 4 as it was done in previous years' reports. Terminous and Bacon Island are on separate sheets. The first two lines in Tables 1 again reveal the main occurrence of the strong velocities in May and June and their quick decline thereafter. However, the September increase at Terminous is unusual, caused by early fall rain storms in the second half of this month. Bacon Island, with recording ending on September 15, does not show this September increase. The storm activity also is reflected in the last two lines in Tables 1 by the low percentage of westerly winds in September at Terminous. The predominance of the westerly directions is shown more impressively and also more detailed in Tables 2. At Terminous the "maximum" directions are WNW and W as was found in last years's records, but on Bacon Island the center of gravity is around WNW. Also, a few SE directions appear on Bacon, and the correlation of those with simultaneous directions at Terminous, as well as other cases, will be tried next year with more data accumulated.

Tables 3 for Terminous and Bacon deserve more discussion because the peak of the number of strong winds previously established for May,

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REPORTED BY H. B. Schultz
Davis - Ag. Engineering
Campus and Department
DATE December 31, 1959

though weak in 1958, was very pronounced in 1959. Only the late September storm troubled the picture in the Terminous table, but not in the Bacon Island table. In the June columns, Bacon Island had much greater numbers of high velocities than Terminous, but no conclusion will be drawn without another season's data. Differences in anemometer mounting or station exposure can too easily overshadow reality in such cases. The very pronounced peak in May probably was the reason of the heavy dust occurrence and complaints by the Stockton population early in the season. However, Table 3 does not reveal the full facts about some of the extreme cases that occurred in the 1959 season. Only the number of hours of velocities greater than 15 mph were compiled in the second line of that table. The 15 mph limit includes a correction for anemometer friction and inertia amounting to 1.5 mph, so that the recorded data above 13.5 mph actually were used. In order to show that this season experienced much higher wind speeds on certain days than the previous season at Terminous, the following tabulation of wind speeds at 6' height are given in values as recorded, without correction:

6/10/58 (last year)	10	hours	with	average	speed	of	15.7 mph
4/24/59 (this year)	8	"	"	"	"	"	16.8 "
5/12/59 " "	9	"	"	"	"	"	19.0 "
6/25/59 " "	9	"	"	"	"	"	17.1 "
6/25/59 (Bacon Island)	9	"	"	"	"	"	19.8 "

It can be seen that periods of long duration occurred on 3 days vs. one day in 1958, and that the three 1959 periods consisted of higher velocities than the one in 1958. Especially Bacon Island recorded very high velocities from WSW on 6/25/59.

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REPORTED BY H. B. Schiller

Davis - Ag. Engineering
Campus and Department

DATE December 31, 1957

Tables 4 containing the hourly distribution show that practically all strong velocities are confined to the afternoon hours on Bacon Island. At Terminous, strong velocities can occur in the morning hours already, as was discussed in last year's report, although the great majority of cases certainly are recorded in the afternoon.

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AGRICULTURAL EXPERIMENT STATION

PROJECT NO. 1656 PG. 1

REPORTED BY H. B. Schultz

Davis - Ag. Engineering
Campus and Department

DATE December 31, 1959

Dardanelles 1959 Wind Survey

Table 1. Number of days with at least one hourly velocity over 10 mph.

	April	May	June	July	Aug.	Sept.	Total
No. of days with records	20	31	30	31	31	30	183
No. of days vel. over 10mph	9	31	25	14	17	21	117
Days with vel. from NW-NNW	7	26	22	14	17	13	99
Days in % of all days over 10 mph	78	84	88	100	100	62	85

Table 2. Prevailing directions for velocities over 10 mph (April 20 to Sept.)

Direction	S	SSE	SE	ESE	E	ENE	NE	NNE	N	NNW	NW	WNW	W	WSW	SW	SSW	Total
No. of days	0	0	0	41	50	1	2	13	0	0	0	0	0	0	1	1	117
Days in %	0	0	0	35	43	1	2	11	0	0	0	0	0	0	1	1	100

Table 3. Frequency of hours of high velocities for the various months.

	April	May	June	July	Aug.	Sept.
No. of hours over 10 mph	79	339	222	80	90	34
No. of hours over 15 mph	33	92	43	2	0	39
Ave. duration of one daily period over 10 mph	8.9	9.7	8.9	5.7	5.3	6.7

Table 4. Daily cycle of frequency of hourly velocities over 10 mph, April to September.

PST	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12
All	13	14	11	13	13	15	22	37	41	42	46	30
%	43	51	60	73	87	87	65	50	37	23	26	19

Data for velocities over 15 mph

No	0	1	0	1	0	2	3	7	11	9	10	15
%	10	14	20	27	26	69	15	6	3	5	6	0

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PROJECT NO. 1836 PG. 13

REPORTED BY E. L. Schultz

Davis - Ag. Engineering
Campus and Department

DATE December 31, 1959

Wind Survey at Bean Island, 1959

Table 1. Number of days with at least one hourly velocity over 10 mph.

	June	July	Aug.	Sept.	Total
No. of days with records	28	31	31	15	105
" " " " Vel. over 10 mph.	28	24	19	5	76
Same with directions between SW and NW	24	21	17	5	67
Same in % of all day over 10 mph	86	80	89	100	88

Table 2. Prevailing directions for velocities over 10 mph (June to Sept. 15)

Directions	S	SSW	SW	WSW	W	WNW	NW	NNW	N	NNE	NE	ENE	E	ESE	SE	SSE	Total
No. of days	0	0	3	0	16	25	22	9	0	0	0	0	0	0	0	0	76
Same in %	0	0	4	0	21	34	29	12	0	0	0	0	0	0	0	0	100

Table 3. Frequency of hours of high velocities for the various months

	June	July	Aug.	Sept.
No. of hours over 10 mph	240	92	74	20
No. of hours over 15 mph	67	5	8	1
Ave. duration of one daily period over 10 mph	8.6	3.8	3.9	4.0

Table 4. Daily cycle of hourly velocities over 10 mph, June to September

PST	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12
AM	0	0	0	0	0	1	5	8	12	15	16	20
PM	24	36	50	66	68	54	24	12	8	4	3	1

Same for velocities over 15 mph

AM	0	0	0	0	0	0	1	2	2	3	4	3
PM	4	7	14	21	15	10	5	4	2	0	0	0

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