

Big Vein of Lettuce

interrelated effects of the disease
and market price on head lettuce yield

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Big vein of lettuce occurs every year in California, especially in the spring crop of the central coastal area where practically 100% of the plants in some fields are affected.

Nevertheless, growers and shippers often question whether or not the disease causes an economic loss, since some fields almost totally affected with big vein have yielded well and have often returned more profit than predominately healthy fields—depending on the market.

Under California conditions, lettuce plants affected by big vein do not develop any necrosis but assume a decidedly upright habit of growth and the veins become slightly cleared. The vein clearing gradually becomes more intense, and the leaves pucker slightly, giving the margins a ruffled appearance. The interveinal tissue adjacent to the veins also becomes translucent, giving the illusion that the veins are enlarged. Observations indicate that head size is reduced and maturity is delayed. Severely affected plants often fail to head. Quality is also lowered in that heads from affected plants appear coarse, ribby and generally unattractive.

The present study was made to determine what effect, if any, big vein exerts on yield of marketable lettuce. Since profit or loss to the grower is largely determined by market price, all data were considered in view of the market conditions which prevailed at the time of harvest.

Ten commercial Great Lakes lettuce

fields with various percentages of big vein were selected for study. Care was taken to select fields which had only traces of other lettuce diseases such as common lettuce mosaic or aster yellows. Harvest data were recorded from five 100' sections of bed in each of the 10 fields. A lettuce bed in the Salinas district is a raised ridge 20" across the top, on which two rows are planted 14" apart. The plants in each row are thinned to intervals of about 1'.

Just prior to the first cutting, the plants which were showing big-vein symptoms and those which were apparently healthy were counted. After each cutting, counts were made of the big-vein and healthy plants which had not been harvested. By calculation, the percentages of the big-vein and clean populations harvested at each cutting and after two or three cuttings were determined.

On the basis of the data presented in the table on this page, the effect of big vein on yield of head lettuce can be summarized as follows:

1. Regardless of market conditions, a large percentage—87%—of the total healthy population was cut in all trials, while only 48% of the total big-vein population was harvested.

2. Regardless of market conditions, a heavy cut-out was made from predominately healthy fields—88% of plot No. 2 and 85% of plot No. 4 were cut during a good market, and 84% of plot No. 10 during a poor market period.

3. In fields with predominately high percentages of big-vein affected plants, an unusually high percentage of the healthy population—90% in plots Nos. 8 and 9—was harvested in the first cutting. This indicates that big vein delays maturity. Time for beginning of harvest in these two fields was probably based on the maturity of the big-vein population. Consequently, when the first cutting was made, practically all of the healthy population was mature or over-mature.

4. Fields with high percentages of big vein yielded low cut-out percentages during a poor market period and high cut-out percentages during a strong market period. For example, on a poor market, plot No. 1 yielded 55% cut-out; plot No. 3, 49%; and plot No. 9, 43%; whereas on a strong market, plots Nos. 5 and 8—with as great or greater percentages of big-vein cut-out—yielded 72% and 75% respectively.

Big vein therefore affects yield but not in a straight-line relationship correlated with percentage infection as is usually true of a disease that renders the lettuce completely unmarketable. Big vein exerts its greatest effect on yield during weak market periods. Since the best-quality product—correct size for a given pack and freedom from defects—is shipped when the market is poor and a product of lesser quality is also acceptable when the market is good, a short supply of lettuce results in a good market or increased demand for any type of lettuce. As a result, undersized heads of poorer quality are accepted by buyers when the market is good but would be refused if an adequate supply of better-quality lettuce were available.

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The Effect of Big Vein on Yield of Great Lakes Lettuce in 10 Commercial Fields in the Salinas Valley

Plot No.	Total plants	Prior to harvest percentage		Percentage of big-vein and clean populations harvested at each cutting						Total percentage harvested		Total percentage of all plants harvested	Market conditions*
		Clean	B.V.	1st cutting		2nd cutting		3rd cutting		Clean	B.V.		
				Clean	B.V.	Clean	B.V.	Clean	B.V.				
1	893	57	43	11	0	35	14	25	18	71	32	55	1.50-1.75, mostly 1.50
2	888	91	9	28	5	42	12	24	11	94	28	88	1.50-2.00, mostly 1.75
3	842	36	64	18	6	45	11	15	16	78	33	49	1.50-2.00, mostly 1.75
4	863	77	23	44	8	45	10	8	2	98	38	85	1.50-2.00, mostly 1.75
5	850	39	61	41	19	51	40			92	59	72	1.75-2.25, mostly 2.00-2.25
6	857	40	60	27	8	41	12	5	21	73	41	54	1.50-2.00, mostly 2.00
7	833	34	66	5	0	40	22	36	33	80	55	64	2.25-3.00, mostly 2.50-2.75
8	849	5	95	90	18	7	41	0	15	97	74	75	2.50-3.10, mostly 3.00
9	869	11	89	90	11	5	26			95	37	43	1.00-1.10, mostly 1.00
10	835	94	6	18	6	33	16	37	4	88	25	84	1.00-1.25, mostly 1.10-1.15
Total for all plots		49	51	27	10	39	24	20	13	87	48	67	

* F.O.B. Salinas price for 2 doz. carton pack.

1.00-1.25 market poor, 1.25-1.50 market weak, 1.50-2.00 market good, 2.00 and up strong.