

New Type Lemon Clipper

current operation of the double clip in lemon picking eliminated, rejects reduced, and harvesting speeded

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A new type lemon clipper, and a new method of picking, increased the actual fruit picking rate by 30% with an overall rate of harvesting productivity increase of 10% during 1951 field trials.

In terms of the 1951 crop this increase in productivity could have reduced harvesting costs by \$400,000 that year.

The design of the clipper blades is such that as the clipper is placed on the lemon button and closed, the blades ride on the button and cut the stem off at its juncture with the fruit. This feature reduces to a minimum the defect identified as cut-buttons, once a prime cause of rejects.

The first effect of the use of the new clipper to be tested, was on the quality of the fruit harvested. Many quality tests were run and typical of them is one in which two samples of 100 lemons each were used. Each contained 50 randomly selected fruit harvested with the existing clipper and 50 with the newly developed clipper. Each of the samples came from a different orchard and was separately inspected by 10 and five inspectors respectively. The results indicated that the new cutter actually reduced the amount of rejects caused by poor harvesting. An analysis of the causes of rejects indicated that some of the common causes for rejection had been eliminated.

Field Tests

Field tests of productivity effects, wear rate and long term quality checks were made by distributing sample clippers to a number of packing houses in Ventura County.

Pickers working for the co-operating houses were instructed in the use of the new clipper, and productivity and quality checks were made for six months.

The method of harvesting with the new clipper requires the picker merely to isolate the fruit and cut it from the stem at the button. This avoids cutting the stem twice, which consumes approximately 24% of the time required to select and and cut the lemon from the tree.

During the field tests, the new clipper and new method of picking resulted in increased productivity. The overall rate of harvesting increased by 10% which was brought about by a 30% increase in the fruit picking rate.

The quality checks during the field

tests indicated that the new clipper, used under everyday conditions, provided fruit of a quality equal to or better than that obtained by the formerly used double clip method.

Because of the stellite cutting edges of the new clipper its wear rate was considerably longer than that of the existing clipper. Sharpening of the clipper blades is a critical problem with existing cutters. They do not hold an edge and are frequently sharpened in the field.

The new cutter can not be sharpened in the field and it is anticipated that the use-life of its cutting edges will be so long that keeping the cutter sharp will become an unimportant component in its maintenance.

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Close up view of cutting action of new lemon clipper.

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Causes of Rejects

Rejection due to	Existing Cutter						New Clipper					
	Number of rejects in sample		% of sample rejected		% of those rejected according to defect		Number of rejects in sample		% of sample rejected		% of those rejected according to defect	
	*Sample A	Sample B	Sample A	Sample B	Sample A	Sample B	Sample A	Sample B	Sample A	Sample B	Sample A	Sample B
Long Stem . . .	2.5	0.0	5.0	0.0	45	0	1.0	3.6	2.0	7.2	63	82
Sharp Stem . .	2.2	0.0	4.4	0.0	39	0	0.6	0.6	1.2	1.2	37	14
Pulled Button .	0.9	0.0	1.8	0.0	16	0	0.0	0.0	0.0	0.0	0	0
Cut Button . . .	0.0	6.0	0.0	12.0	0	100	0.0	0.2	0.0	0.4	0	4
Total	5.6	6.0	11.2	12.0	100	100	1.6	4.4	3.2	8.8	100	100

* Sample A: Contained 100 randomly selected fruit, 50 each of fruit harvested with existing cutter and with new cutter. It was separately examined by 10 inspectors and the number of rejects reported is the average for the 10 inspectors.

* Sample B: Same as "A" but fruit taken from a different orchard and separately checked by 5 inspectors and the number of rejects reported is the average for the 5 inspectors.

Left, cutting lemon from stem and tree with new clipper. Combines first and second clips necessary with existing cutter. Right, lemon after picking with new clipper. Note undamaged fruit and close cut.

