

Biology/Phenology

Leafroller Mating Disruption on Apple

J.F. Brunner, M.D. Doerr, Lyla Lampson

Washington State University Tree Fruit Research and Extension Center, Wenatchee, WA

*Keywords:* leafroller, obliquebanded leafroller, *C. florus*, apple

**Leafroller dispersal.** The investigation of leafroller (LR) behavior is complicated by the ability to find "clean" orchards in which to establish studies. Two sites were located in Milton-Freewater (MF), OR, and one in Wenatchee. Hand removal of LR larvae (OBLR) was required in the MF sites. Larvae from other locations that had high infestations were collected and transported to test site orchards and placed on selected trees (release trees). There were three replicated release tree sites at each study location. The number of larvae successfully establishing on release trees was determined by counting the number of active feeding sites per tree following the final infestation. Only one MF location proved to have enough LR larval establishment to continue the test. At the other two locations parasites (*C. florus* at the Wenatchee location) attacked the majority of larvae released on trees.

Following the emergence of moths, oviposition and egg hatch period, each release tree and trees in main compass directions away from the release trees were sampled for the presence of hatched egg masses and live LR larvae. The number of egg masses and larvae was recorded. The vast majority of egg masses occurred on the release trees, 88% when considering distribution within the same row as the release trees and 98% when considering distribution across rows (Table 1). There was more dispersal within the same tree row as the release trees, but only after about two trees from the last release tree was there any difference. There was less movement of female moths across rows with virtually no egg masses found more than two rows from the release trees.

The distribution of OBLR larvae on release and non-release trees is given in Table 2. The pattern was similar to that observed for the egg masses though some limited dispersal was detected at greater distances from the release trees compared to the egg masses. This suggests that ballooning larvae can spread considerable distances from the site of an egg mass but the proportion actually surviving to establish at these distances is very low. Very few larvae survive, even on trees where egg masses occurred. The overall percentage of larvae on trees relative to the number of eggs was only 1.3%. This shows that there is tremendous natural mortality of LR larvae when they attempt to disperse, especially on small trees.

**Table 1.** The average number and percentage of OBLR egg masses located on release and non-release trees in the dispersal study at Milton-Freewater, OR, 1995.

Tree	Eggs—across	Eggs—within	% across	% within
Release tree	32.33	32.33	97.98	88.58
D1	0.25	3.33	0.76	9.13
D2	0.08	0.17	0.25	0.46
D3	0.33	0.17	1.01	0.46
D4	0.00	0.17	0.00	0.46
D5	0.00	0.17	0.00	0.46
D6	0.00	0.17	0.00	0.46
D7	0.00	0.00	0.00	0.00

**Table 2.** The average number and percentage of OBLR larvae located on release and non-release trees in the dispersal study at Milton-Freewater, OR, 1995.

Tree	Larvae—across	Larvae—within	% across	% within
Release tree	80.3	80.3	93.1	83.4
D1	3.2	11.2	3.7	11.6
D2	0.9	0.8	1.1	0.9
D3	0.2	0.3	0.2	0.3
D4	0.2	0.8	0.2	0.9
D5	0.8	1.0	1.0	1.0
D6	0.3	0.8	0.3	0.9
D7	0.3	0.0	0.3	0.0
D8	0.0	0.5	0.0	0.5
D9	0.0	0.3	0.0	0.3
D10	0.1	0.2	0.1	0.2
D11	0.1	0.0	0.1	0.0