#327

flight[illegible]d June. At each examination flies were counted and remo[illegible]cky coating was renewed. In 1968-70, twenty such posts [illegible]-mile intervals along roadsides in the beet growing area [illegible]inidoka, Idaho. In 1971, ten of the same 20 locations, [illegible]test number of flies had been trapped previously, were 975, rough, unpainted lath posts were compared with [illegible]ite posts. Also in 1974 and 1975, stakes were maintained [illegible]urvey fields where, in mid-season, maggot populations [illegible]ed in untreated check plots by sifting cores of soil each [illegible]et. In 1975, damage ratings (1) were obtained at mid-s[illegible]1974 and 1975 were obtained in cooperation with resea[illegible] of The Amalgamated Sugar Company and the Utah [illegible]ompany. Unless otherwise stated, all work was done [illegible]al Idaho.

Results

[illegible]plor on fly catches is summarized in Table 1. The data [illegible]nd Peay (3) are included. All data are presented as perce[illegible]mber of flies caught on black stakes since black was includ[illegible]rs of testing and averaged better than green (the only [illegible]sent in all years). Colors ranked in essentially the same [illegible]r: red and orange caught more flies than black in 4 of 5 [illegible]The lighter colors (yellow, white, silver, and unpaint[illegible] caught fewer flies. Blue, brown, and green were inter[illegible]dom attracted as many flies as black. Orange is our color[illegible]: there appears to be little, if any, difference between [illegible]l the black-bodied flies are more easily identified and [illegible]c lighter background.

T[illegible]ugarbeet root maggot flies on sticky stake traps of various [illegible]olors [illegible] those caught on black traps.[1] Southern Idaho, 1965-1972.

Color	1966[2]	1967[2]	1968	1969	1972	Average
Red			108.3		112.8	110.6
[illegible]range			114.6	111.7	97.0	107.8
[illegible]lue			86.4	99.0		92.7
[illegible]rown			82.4	100.7		91.6
[illegible]reen	97.6	100.9	77.3	99.9	73.5	88.1
[illegible]ellow	89.9			99.5	70.7	79.1
[illegible]hite	73.8					70.2
[illegible]ilver			47.9	87.9		67.9
[illegible]npaint	76.0					61.8

[1] [illegible]he nu[illegible]on black stakes, the number of stakes tested per color, and the number [illegible]d trappere: 1965- 1248, 5, and 78; 1966- 3879, 4?, and 104; 1967- 910, 3?, [illegible]nd 56; [illegible] season; 1969- 1076, 10, and 18; 1972- 461, 4, and 48
[2] Based [illegible]n and Peay, 1969.

[illegible]Ike height on fly catches is summarized in Table 2. In 19[illegible] were placed from ground level to 7 ft., those with the st[illegible]ft. above ground level caught 48.1% of the total trapp[illegible]bers were caught above and below this level. In

subsequent years, stakes at the 1-ft. level invariably caught more flies than stakes at the 2 or 3-ft. levels.

The effect of trap exposure (compass direction) is summarized in Table 3. Duncan's multiple range test showed north to be superior to the other directions though east did not differ significantly from north at the 5% level.

Table 2.—Catch of sugarbeet root maggot flies trapped at various heights by sticky traps.

Year	Ground	Percentage Captured When Bottom of Stake Was At Indicated Height (ft.)				
		1	2	3	5	7
1968	36.9	48.1		12.3	2.4	0.3
1968		78.9		21.1		
1969		62.0	38.0			
1970		45.1	37.8	17.1		
1971		74.5	25.5			
1973		69.8	30.2			

Table 3.—Percentage of sugarbeet root maggot flies[1] collected on sticky stake traps facing each cardinal direction, 1968-70.[2]

Direction	Percentage Flies Collected In 1968	1969	1970	Average
North	33.2	28.5	26.9	29.5 a[3]
East	25.5	26.8	25.7	26.0 ab
South	19.8	24.1	23.5	22.5 b
West	21.5	20.6	23.9	22.0 b

[1]Total flies trapped were 2,393 in 1968, 9,922 in 1969, and 16,343 in 1970.
[2]Trap height in 1968 (3 ft.-3 ft. 10 in.); 1969 (2 ft.-2 ft. 10 in.); 1970 (1 ft.-1 ft. 10 in.).
[3]ANOVA showed significant differences at the 5% level. Means followed by the same letters do not differ significantly from each other.

Table 4.—Number of sugarbeet root maggot flies collected by sticky stake traps on 2 types of posts. South-central Idaho, 1975.

Post type	No. Flies Collected In Indicated Field 1	2	3	4	5	6	7	8	9
White 2 × 2 in.	0	9	63	28	87	279	222	21	839
Lath, unpainted	1	4	39	7	33	178	120	18	704

Because rough laths are relatively cheap and require no preparation as compared with the 2 × 2 in. posts painted white, the two were compared in 1975. Three of each were placed in pairs on the margins of 9 survey fields in south-central Idaho. Orange sticky stakes were stapled at the 1-ft. level facing east. The results are shown in Table 4. A t test showed that significantly more flies were caught by stakes mounted on the white posts.

The relationships between sticky stake fly catches and maggot counts in 1974 and 1975 are given in Table 5. Correlations were highly significant except for the series of 8 survey fields in eastern Idaho in 1974. The changes in stake color and exposure from 1974 to 1975 are

Table 5.—Relationship between seasonal total of flies caught per sticky stake trap[1] and maggots per beet in sugarbeet root maggot survey fields. Idaho.

Year	Area	No. Fields	Mean No. Flies/ Stake (X)	Mean No. Maggots/ Beet (Y)	Regression Equation (Ŷ=a+bX) a	b	r Value
1974	Eastern	8	154.5	1.31	.82	.0032	.29 ns
1974	South-central	9	144.8	2.07	−1.63	.0276	.83**
1974 & 1975 Combined	South-central	12	145.6	2.40	−1.51	.0269	.91**

[1]All sticky stake traps were stapled to 2 × 2-in. white wood posts between 1 ft. and 1 ft. 10 in. above ground level. Traps were black in 1974 and faced N and E. Traps in 1975 were orange and faced E.

considered to be of no consequence. The 1974 data for eastern Idaho showed a non-significant correlation. Plots in eastern Idaho were established by personnel of Utah-Idaho Sugar Company (now U & I, Incorporated). These plots were often narrow strips bounded by treated areas and their exact location and history was sometimes uncertain. We, therefore, consider these data to contain errors markedly affecting results. When we combined the data for 1974 (9 fields) and 1975 (3 fields) in south-central Idaho, a correlation value of 0.91** was obtained which means that 82% of the variation in maggot populations could be explained by variations in fly populations as measured by the sticky stake traps.

The relationship between fly populations and damage ratings is presented in Figure 1. Of a total of 12 sets of data available, two were discarded because no flies were trapped and damage ratings were also either zero or nearly so. A third set was discarded due to an obvious error. The correlation for the remaining data (n=9) was .91**. The regression formula is given in Figure 1.

Summary and Conclusions

Either orange or red sticky stake traps 1 × 10 in. stapled vertically with the bottoms 1 ft. above ground level on white 2 × 2 in. posts facing either east or north and located at the margins of sugarbeet fields were found to be superior to other colors, heights, and exposures in trapping adult sugarbeet root maggots. An additional advantage of orange-colored traps is that flies are more easily identified on this background than on darker colors. Advantages of placing stakes 1 ft. above ground rather than simply sticking pointed garden stakes in the ground is that the higher level collects less dirt and trash, and birds are less likely to remove the flies. In the area of our tests, prevailing winds are from the west or southwest, and this may be the reason why we had larger fly catches on north and east exposures. The number of flies trapped with orange and black stakes mounted at the 1-ft. level and exposed to north or east directions were found in 1974 and 1975 to correlate well with both maggot populations and damage ratings. Such counts thus can be used to predict maggot populations and damage ratings.

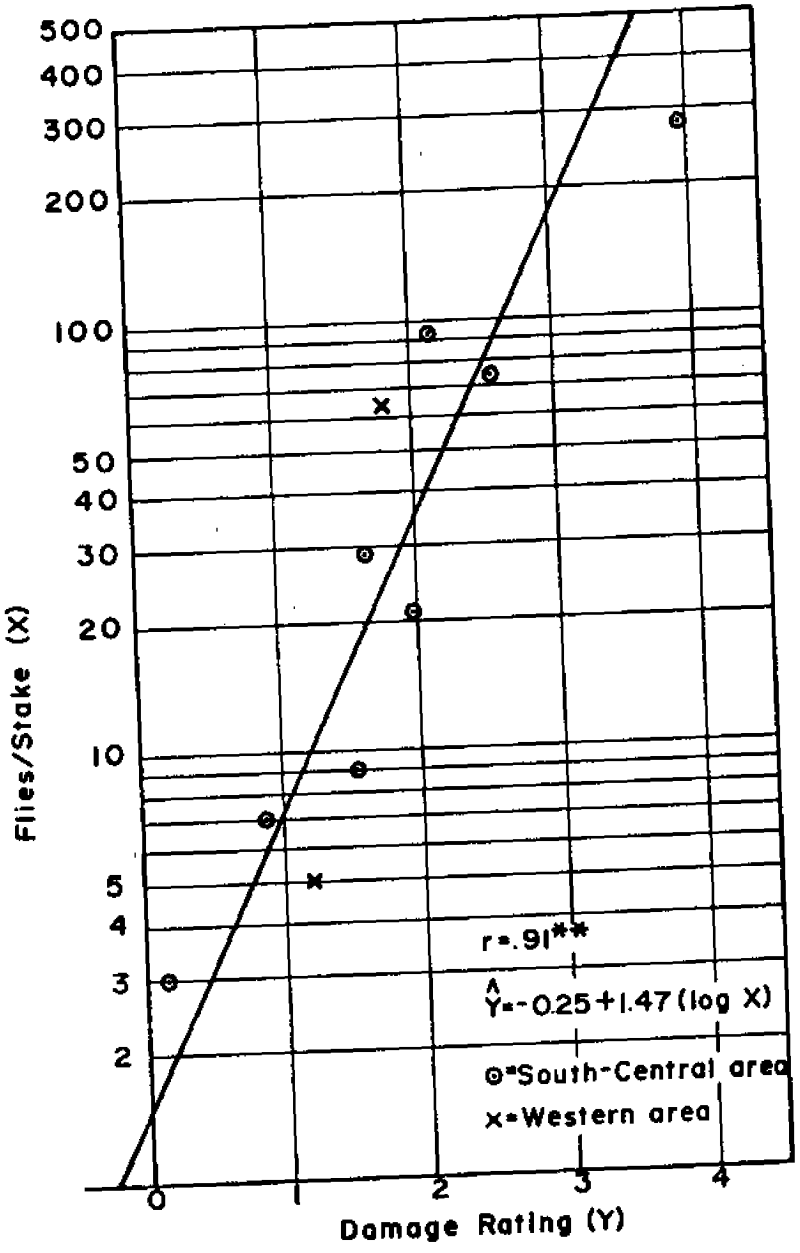

Figure 1. Relationship between total number of sugarbeet root maggot flies trapped per sticky stake and sugarbeet damage rating Idaho, 1975.

We propose to standardize survey stakes as shown in Figure 2.

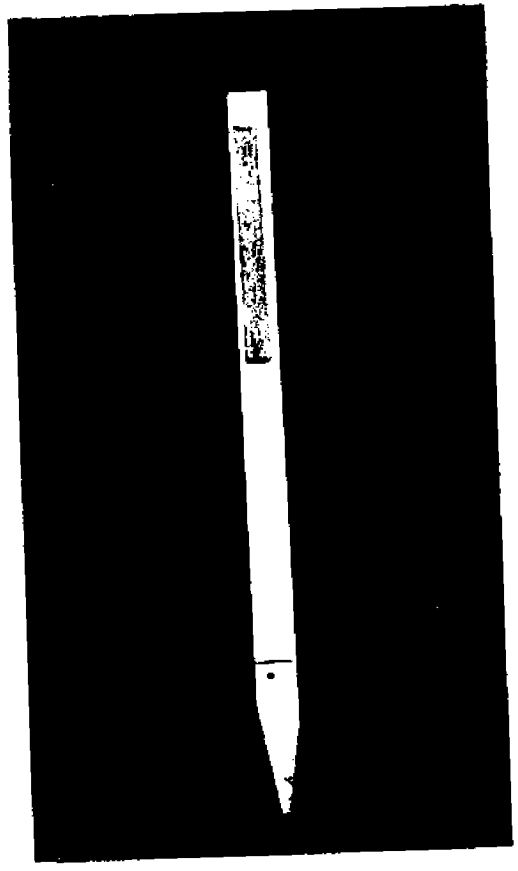

Figure 2. Standard sticky stake trap for monitoring sugarbeet root maggot adults. Orange 1 × 10 in. garden stake mounted with bottom 1 ft. above ground level on 2 × 2 in. white post.

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Acknowledgments

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