Evaluation of a Wing-Type Against a Bucket-Type Fruit Fly Trap for Use in Table Grape Vineyards

A. Schwartz[1] and D. Capatos[2]

1) Nietvoorbij Institute for Viticulture and Oenology (Nietvoorbij), Private Bag X5026, 7599 Stellenbosch, Republic of South Africa
2) Biometric Services, Winter Rainfall Region, Private Bag, 7607 Elsenburg, Republic of South Africa

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The standard fruit fly trap (wing-type) was evaluated against a new (bucket-type) trap on table grapes. From an initial value of 47,7%, relative effectiveness, the standard trap showed a sharp decline during the second to fourth week and reached zero within a period of eight weeks. Both the linear and quadratic terms of the regression curve of relative effectiveness against time were statistically significant. It is suggested that the standard type of trap be replaced by the new bucket-type fruit fly trap.

Fruit fly is one of the key pests in the production of table grapes in the Western Cape. Two species of fruit fly are involved, viz. Mediterranean fruit fly [*Ceratitis capitata* (Wied).] and Natal fruit fly [*Ceratitis rosa* (Karsch)]. A recent report by Unifruco (1993) indicates that 45 860 export cartons from the 1992/93 crop were rejected as a result of fruit fly damage.

Current fruit fly control measures consist principally of toxic bait applications, backed by decision-making information obtained from a fruit fly trap. Since a fruit fly trap is an essential part of the total strategy against fruit fly on table grapes, it was decided to evaluate the effectiveness of the standard trap against that of a new imported trap.

MATERIALS AND METHODS

The standard trap being utilised by the table grape industry is known as the wing-type (Fig. 1). A rubber septum impregnated with Trimedlure (t-Butyl-4 (or 5)-chloro-2-methyl cyclohexane) impregnated into a rubber septum serves as male attractant on a sticky bottom surface of the trap. The new imported fruit fly trap is a bucket-type, also known as the Morocco trap (Fig. 1); a polymer plug impregnated with trimedlure is housed in the top part of the trap. Arriving male fruit flies are killed by the vapour emanating from a plastic strip impregnated with dichlorfos and located in the bottom section of the trap.

The trial was carried out in a one-hectare table grape vineyard at Nietvoorbij, Stellenbosch. It featured two treatments, viz. the standard trap (wing-type) and the new trap (bucket-type), with three replications of each type. The traps were arranged on the periphery of the vineyard in a completely randomised layout at intervals of approximately 30 m. Each trap was positioned in the shade of the vine, approximately 1,5 m above the ground. The trial was initiated in March and lasted eight weeks. At the end of every week (except week six) the fruit flies caught in each trap were removed and the numbers recorded. Every week the effectiveness of the standard trap relative to the new trap was measured by expressing the number of flies caught during that week by the standard trap as a percentage of the total number of flies caught during the same week in both kinds of trap.

RESULTS AND DISCUSSION

Both species of fruit fly, i.e. *C. capitata* and *C. rosa*. were attracted to both trap designs. However, *C. capitata* was the dominant species recorded, with *C. rosa* accounting for approximately 20% of the catch.

The number of flies caught in either kind of trap (totalled over all three replications) ranged from 44 to 257 per week (Fig. 2). Over the eight-week period of this trial the relative effectiveness of the standard trap (averaged over three replications) declined from 47,7% to 0,0% (Fig. 2). Apart from a slight increase from 3,2% to 4,7% between the 4th and 5th weeks, there was a progressive decline of observed relative effectiveness against time. A fitted quadratic regression curve of relative effectiveness against time gave a good approximation of the observed decline. Both the linear and quadratic terms of the regression curve were statistically significant. This proves that the observed decline was statistically significant and also that the rate of decline decreased significantly over the experimental period. Although replacement of the rubber septum in the standard trap is usually needed after six weeks, the poor performance of the trap was already evident after two to three weeks of testing.

It appears that the inferior performance of the standard trap during this trial could be ascribed to trap design or quantity of chemical attractant or a combination of these factors.

CONCLUSIONS

Under the conditions of this trial, the standard trap was much less effective than the new one.

The exceptionally high losses for export table grapes during 1993, due to fruit fly damage, underline the urgency for improvement of control measures in vineyards. One way of reaching this goal is to make available a more efficient fruit fly trap. It was demonstrated that the new bucket-type trap satisfies this requirement.

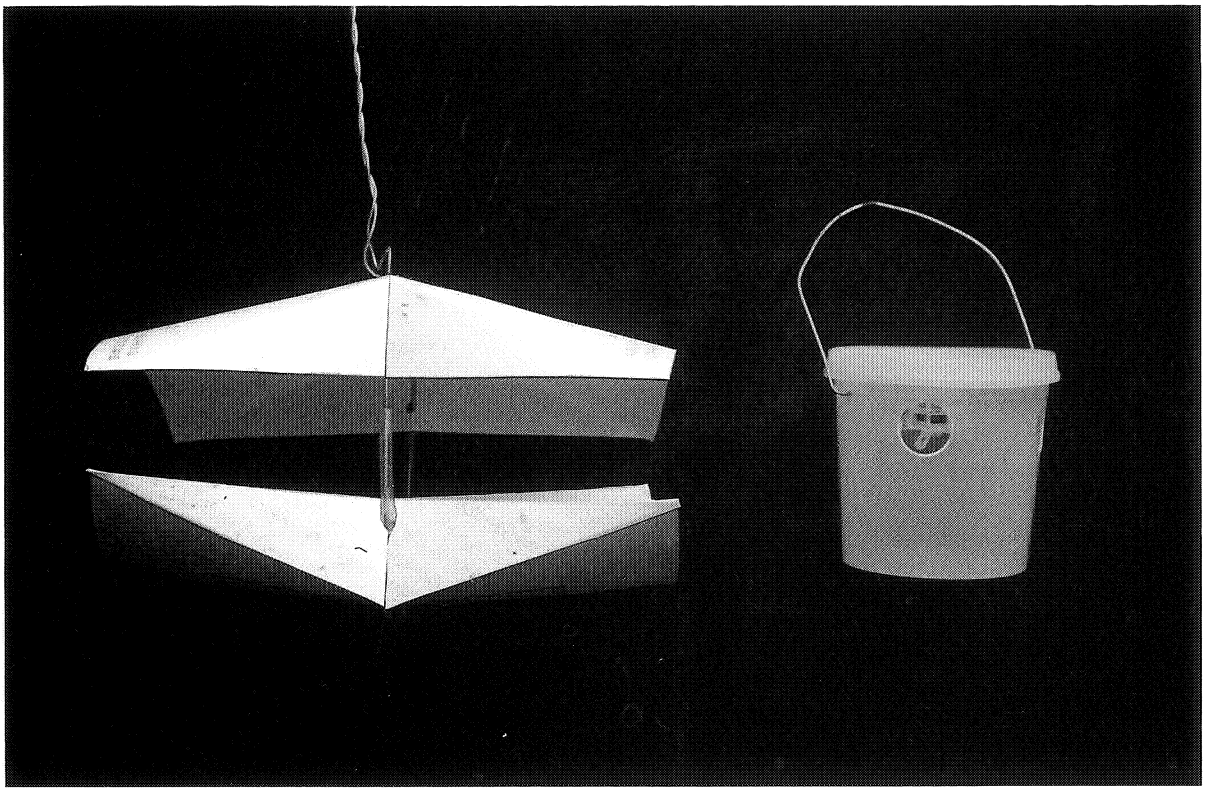

FIGURE 1

Test traps: Wing-type (left) – Bucket-type (right).

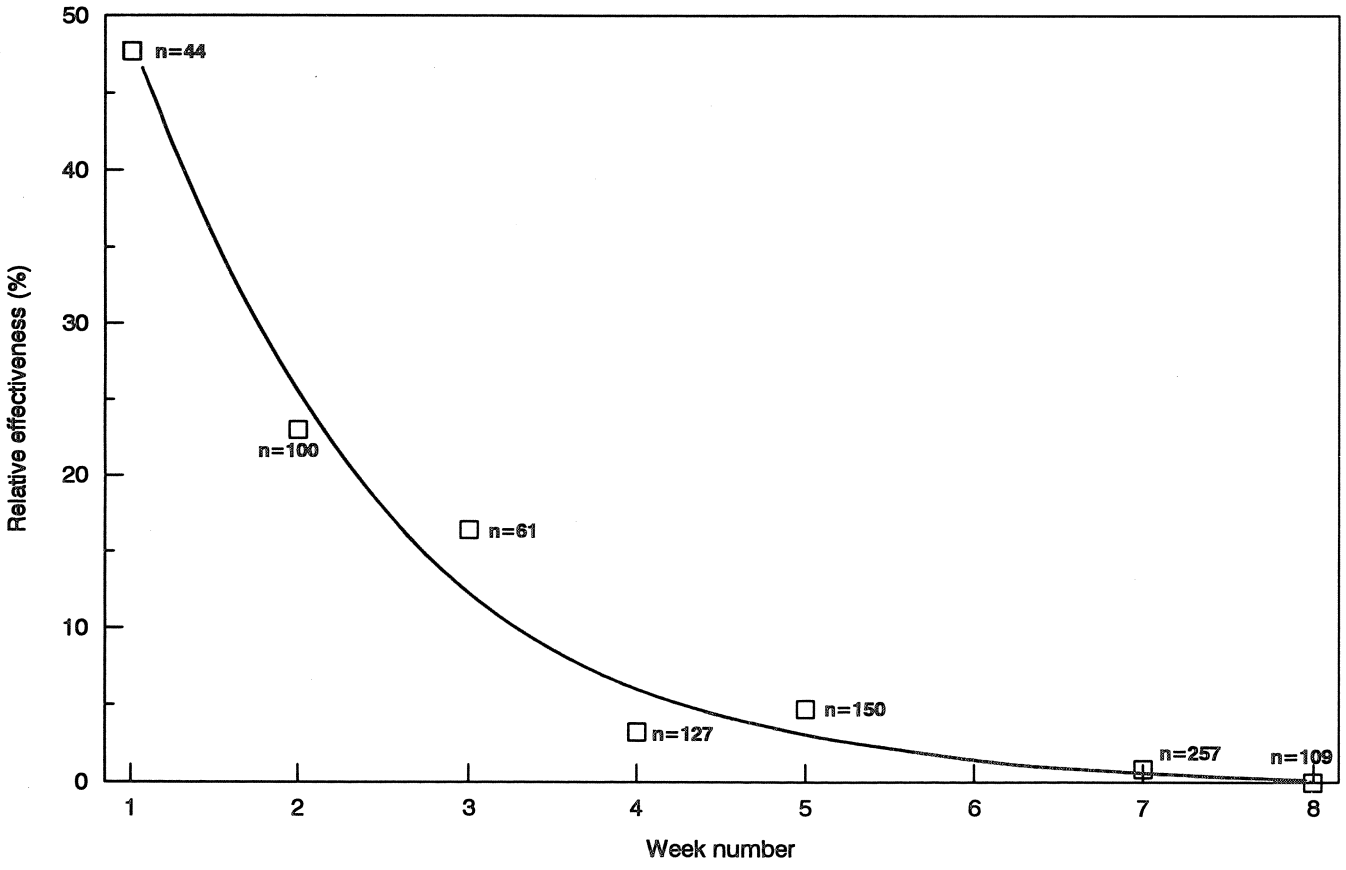

FIGURE 2

Relative effectiveness of the standard fruit fly trap (wing-type) in relation to the new trap (bucket-type); n = total number of fruit flies caught over both kinds of traps.