HortScience 15(6):791. 1980.

Wirestrippers: a New Tool for Emasculation of Pome and Stone Fruits[1]

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Additional index words. Malus domestica, pollination, fruit breeding

Various techniques have been used for emasculation of rosaceous fruits; fingernails, scalpels, and tweezers are typical tools (1, 3, 5, 7). Emasculation tools for stone fruits have been made from a hacksaw and from square-jawed forceps with cut out corners (6). Barrett and Arisumi (2) devised an instrument that consisted of a pair of scissors with a triangular notch in the blade whose width could be adjusted by an adjustable arm or set screw.

Emasculation has been found to adversely affect fruit set in 'Delicious' apple (4, 5, 7, 8), possibly due to desiccation (4, 7), and thus bagging of individual limbs to prevent cross-pollination by bees has been suggested as an alternative (3, 5). (Incompability prevents self-pollination in apple.)

Wirestrippers which are readily available in hardware stores were tested as an emasculating tool because it was thought they might reduce injury associated with other emasculating techniques and bagging flowers is not efficient. The tool used (General, Model No. 69) was adjustable for various wire gauge sizes; 14 gauge was found to work best for 'Oregon Spur Delicious' apple flowers. The flowers were encircled by placing the notches at the base of the corolla and closing the jaws of the tool. The instrument was then pulled up the floral axis stripping away the petals and anthers (Fig. 1). The sepals, stigmas, styles and receptable were left intact with the filament (without anthers) surrounding the intact pistils. The procedure was performed at full balloon stage.

'Ben Davis' pollen was applied to stigmas of flowers emasculated with wirestrippers in 1979. Fruit set counts were made 10 weeks after pollination and compared to fruit set from non-emasculated flowers on limbs that had been bagged with voile cloth and hand pollinated with pollen from 'Ben Davis'. Three limbs were used for each treatment; 40 to 70 flowers per limb were pollinated.

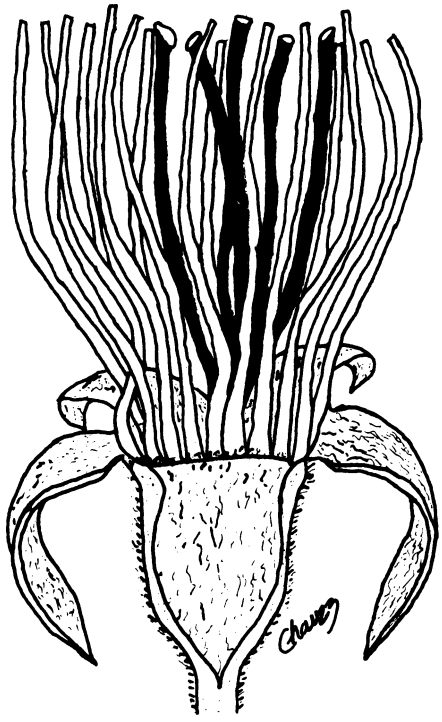

Fig. 1. Diagram of apple blossom emasculated with wire stripper. Dark structures are styles.

Emasculation with wirestrippers did not adversely affect fruit set as compared with bagging (Table 1).

In a second experiment, 1980, using pollen from *Malus zumi calocarpa,* emasculation with wirestrippers gave better fruit set than the non-emasculated bagged treatment (Table 2). Emasculated flowers, not pollinated and not bagged, set only 1 fruit from 218 flowers. Bees did not visit emasculated flowers during 3 hr of observations.

Wirestrippers provide an inexpensive and efficient tool for emasculation. Skill using this instrument is obtained with just a few trials. Because of the adjustable notch sizes, this tool could be used for emasculation of other crops as well. In 1980, wirestrippers were also successfully used to emasculate peach flowers.

Table 1. Effects of emasculation with wirestrippers and bagging of limbs on fruit set of 'Oregon Spur Delicious' apples, 1979.

Treatment	No. of flowers	Fruit set[z] (%)
Emasculated	187	56
Bagged	179	57

[z]No significant difference between treatment by student's t-test, 5% level.

Table 2. Effects of emasculation with wirestrippers and bagging of limbs on fruit set of 'Starkrimson Delicious' apples, 1980.

Treatment	No. of flowers	Fruit set[z] (%)
Bagged, non-emasculated, pollinated	220	39 a[y]
Bagged, emasculated, pollinated	215	38 a
Not bagged, emasculated, pollinated	226	45 a
Not bagged, emasculated, not pollinated	218	1 b

[z]Means of 4 single limb replications.

[y]Mean separation by Duncan's multiple range test, 5% level.

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[1]Received for publication July 7, 1980. Technical Contribution No. 1744. South Carolina Agr. Experiment Station, Clemson. The cost of publishing this paper was defrayed in part by the payment of page charges. Under postal regulations, this paper must therefore be hereby marked *advertisement* solely to indicate this fact.

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