



FRUIT GROWERS' LETTER

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January 1969

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THE REVOLUTION IN APPLE PRODUCTION

Picking--more, faster, and cheaper--is the goal of the modern apple producer.

Most apple picking machines are still experimental. The two broad types are the shake-and-catch systems (primarily for apples for processing) and mechanical aids to hand picking, such as platforms (primarily for fresh-market apples).

Changes are expected in tree size, shape, cultural practices, and orchard location. Smaller trees (to reduce bruise damage from dropping) with higher skirts (to provide clearance for equipment) are being developed. High density hedge row plantings and high density plantings of individual circular trees are being studied.

Current research seems to be working backward. The primary fully mechanical effort--shake-and-catch system--is aimed at the older existing orchards, while only semi-mechanical ideas--platforms--are being developed to harmonize with cultural improvements such as tree density for the orchard of the future.

The USDA Tree Fruit Research Center at Washington State University is working with a prototype two-level, self-propelled platform carrying four pickers, one at each of two levels on each side of the machine. A guide shoe travelling in a furrow centers the mechanism between "tree walls"--high density hedge rows, 6 feet thick and as tall as they'll grow (the trees are young, hence only two levels to the platform; as the trees grow, more levels will be added). Conveyors from each picker carry the apples to a bin which rotates for even fill and is gradually lowered to minimize bruising. Full bins are automatically set down in the row, while a fresh bin prepositioned ahead of the machine is picked up and set in place.

The University of New Hampshire is experimenting with pruning systems to modify tree growth patterns and determine those most suitable for mechanical harvesting. Additional work on tree size and shape is being conducted at Cornell University.

Virginia Polytechnic Institute is currently evaluating a shake-catch system using a Durham catching frame. Other shake-and-catch research is being conducted at Michigan State University and at Pennsylvania State University.

Harvey Harvesters, Inc., of Grand Haven, Michigan, has developed a 30' x 30' tractor-drawn, powered catching frame, which is being tested in conjunction with Michigan State. The frame extends at the touch of a button, and is held 18" above the ground. After shaking, the frame automatically rolls back and the apples collected in a cross conveyor. An elevator then takes them to 20-bushel boxes.

Pennsylvania State is also doing research to determine maximum dead load and shock load tolerances, to pinpoint the best time for harvest and what cushioning and weight deadening materials might be used. (From Canner/Packer)

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This archival publication may not reflect current scientific knowledge or recommendations.
Current information available from University of Minnesota Extension: <http://www.extension.umn.edu>.

COST AND EFFECTIVENESS OF SPRAY MATERIALS

Cornell University recently published information concerning effectiveness and cost of spray materials per 100 gallons. The following tables are summaries of the published information. It should be noted that the prices used are approximations, because prices for a material vary according to size of package, volume, and other discounts. Also, insecticide and fungicide effectiveness will vary, in different geographic locations.

This type of information, however, can be a useful tool to aid the grower to reduce the cost of production. All too often pesticide sprays are utilized which are highly advertised, "high priced," but often are no more effective than certain less expensive sprays.

Take time this winter to analyze your 1968 spray program. Can you improve its effectiveness? Can you reduce its cost without sacrificing apple quality and production? (From New York State Horticultural Society Newsletter)

EFFECTIVENESS AND COST OF FUNGICIDES FOR CONTROL OF APPLE SCAB					
Materials	Eradication (hours after rain starts)	Retention	Redistribution	Amount per 100 gals.	Cost per 100 gals.
Glyodin	None	Good	Poor	1 quart	0.80
Ferbam	None	Good	Good	1 1/2 lb.	0.67
Cyprex	20-28	Good	Good	3/8 lb.	0.90
Captan	18-24	Fair-Poor	Fair-Good	2 lb.	1.07
Thiram	18-24	Fair-Good	Fair-Poor	2 lb.	1.36
Maneb	18-24	Good	Good	2 lb.	1.87
Dichlone	30-48	Fair-Poor	Poor-Fair	1/2 lb.	1.05
Mercury (Tag, etc.)	60-96	Good	Poor	1/2 pint	1.06

EFFECTIVENESS, RATE, AND COST OF APPLE INSECTICIDES PER 100 GALLONS

Material	Curculio	Red banded leaf roller	Codling moth	Apple maggot	Red mite	Rate per 100 gals.	Cost per 100 gals.	Remarks
Superior oil (70 sec.)					Good	2 Bal	1.36	½-inch green
Dieldrin	Very good					½ lb	.73	2 to 3 applications
DDT (50%)			Good	Good		2 lb	.54	
Lead Arsenate	Fair	Fair	Fair	Good		3 lb	.93	
Parathion (15%)	Good (2 lb)	Good (2 lb)	Good (1½ lb)	Good (1½ lb)	Fair (1 lb)	2 lb	.84	
Malathion (25%)		Good	Fair	Poor	Poor	2 lb	1.00	
Phosdrin (4E)		Good			Fair	¼ pt	.79	Avoid skin absorption
Guthion (25%)	Very good	Very good	Good	Good	Fair	1 lb	1.65	Avoid skin absorption
Diazinon (50%)	Fair	Fair	Good	Good	Fair	1 lb	2.13	
Sevin (50%)	Fair	Fair	Very good	Good		2 lb	1.20	Will thin fruit
Ethion (25%)			Good		Very good	1 lb	.99	Not on Wealthy
Trithion (25%)			Good	Good	Very good	2 lb	.91	
Genite 923					Very good	1½ pts	1.20	One application pink
Tedion (liquid)					Very good	1 qt	2.01	
Morestan (25%)					Good	½ lb	2.43	
Kelthane					Very good	¾ lb	1.24	Long residual control



NEWS BRIEFS
FROM THE HORTICULTURE DEPARTMENT

SEPTEMBER AN EVERBEARING RED RASPBERRY -- In west central Minnesota the September variety of raspberries has shown some potential as a fall crop except that it does not consistently ripen before frost.

On the assumption that clipping the growth to ground level in the spring would advance crop maturity in the fall, a study was set up with the September variety at the West Central Experiment Station at Morris. The summer crop is lost by spring clipping, however, other high yielding summer varieties are available which are superior to September.

Five training systems were used in the experiment and the summer and fall crops were harvested. The treatments were as follows:

- 1 All growth cut to the ground in early spring; no thinning during season.
- 2 Hedge Row System -- Rows 1 foot wide, 8 canes per lineal foot, wire support.
- 3 Hedge Row System -- As above, but no support, and canes cut back to 3-foot height in spring.
- 4 Hedge Row System -- Identical to No. 3, plus a straw mulch.
- 5 Control -- Hedge Row with no thinning, no support, no mulch.

The planting was made in the spring of 1966, replanted where necessary in 1967, and yields taken in 1968. First picking was made July 1 and the last on July 29. The fall crop did not mature prior to the first killing frost.

Clipping the canes to the ground in the spring did not result in earlier fall production; or at least not before a killing frost (September 27, 1968).

Several surprising results were observed with the summer, or normal crop. Treatment No. 2 produced by far the lowest yield (2578.4 grams/20' row). The wire support or lack of clipping had some effect on yield. Treatment No. 3 yielded approximately twice as heavily as treatment No. 2 (5203.2). Adding mulch to treatment No. 3 boosted yield considerably, to about 3.2 times (8303.2) the yield of treatment No. 2. The highest yield (8759.9) was obtained from the unthinned hedge row cut back to 3 feet and mulched. Many more producing canes were involved in this treatment. In future years yield on this treatment may decrease, as the competition or "weed" factor becomes more prevalent.

We can conclude that this variety is not suitable for production of a fall crop and is not recommended for such purposes in west central Minnesota. The highest yield of the summer crop was obtained by growing the plants in an unsupported hedge row which was cut back to 3 feet in the spring and which was mulched with 1 foot of straw. (W. H. Gray, Horticulturist, West Central Experiment Station, Morris, Minnesota)

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Edited by Leonard B. Hertz, Extension Horticulturist
Agricultural Extension Service
University of Minnesota, St. Paul, Minnesota 55101

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Trade names are sometimes used in this publication to clearly describe products. The use of a trade name does not imply endorsement by the Minnesota Agricultural Extension Service, nor does omission of other trade names imply nonapproval.

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