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Cost of Pesticides Used In Greenhouses

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Growers who produce cut flowers, potted plants, bedding plants, perennials and field-grown flowers must grow a commercially acceptable crop for sale in the marketplace. A commercially acceptable crop could be defined as one that is free of pests such as insects and diseases and is visibly undamaged by mechanical means. In other words, a perfect or nearly perfect product is required for sale.

In order to produce that nearly perfect product, growers often rely on the use of growth regulators, insecticides, miticides, fungicides and other materials for pest and height control. Too frequently, many of these products are used without knowledge of their effectiveness of control, their safety on crops, or costs of the solutions used. In this paper we will present information that will put the costs of pesticides in perspective.

One may ask 'Why this topic?' The reasons are as follows: many growers have requested it; and, there is confusion in this area because we are dealing with different rates, different amounts of active ingredients, and different costs of formulated products as they are purchased; and, furthermore, growers are becoming more 'cost conscious' each season.

Tables 1, 2 and 3 list products, formulations, rates and costs for 100 gallons of mixed solutions. The costs of these solutions exclude labor in mixing, and wetters/spreaders or other ingredients. In other words the costs are for the listed pesticide in 100 gallons of water assuming no cost for the water, equipment to pump or labor to mix it. Costs of the pesticides were derived from many local suppliers of these products on Long Island in January 1982. The rates of products listed in Tables 1, 2 and 3 are those found in Tables 6, 8 and 9 in "Cornell Recommendations for Commercial Floriculture Crops—Part II: Pest Control—Diseases, Insects and Weeds." These rates are those generally suggested by the chemical manufacturers and/or Cornell University for New York State.

Growth regulators: In regard to costs, please note the major differences between certain materials. Note for instance, in Table 1, the extreme expense of Arest in contrast to other growth regulators. Also in Table 1, note how inexpensive a 100 ppm solution of Florel is when compared with the other growth regulators. Additionally, be aware of the current costs of B-Nine and Alar. Presently, costs of mixed solutions of both materials at the same concentrations are equal. In former years, Alar was less than half the cost of B-Nine!

*The author wishes to thank Maria Macksel for helping develop much of the cost information in this paper.

Table 1. Growth regulators, formulations and costs at recommended rates of application.

Pesticide	Formulation	Cost	Rate/100 gal	Rate	Cost/100 gal[a]
Growth Regulators					
B-Nine	SP	18.20/lb	2500 ppm (.25%)	393 oz	$ 45.00
			5000 ppm (.5%)	786 oz	90.00
Alar	WP	18.20/lb	2500 ppm (.25%)	393 oz	$ 45.00
			5000 ppm (.5%)	786 oz	90.00
Cycocel	L	113.00/gal	1500 ppm (1:80)	1627 fl oz	$ 144.00
			3000 ppm (1:40)	3254 fl oz	288.00
Florel	L	11.00/qt	100 ppm	2.35 ml/l	$ 4.34
Arest	L	139.00/gal	100 ppm	4848 fl oz	$5236.00

[a] This table was prepared by calculating costs of materials when used in units of 100 gallons of water. To determine the cost for smaller volumes move the decimal point to the left, i.e., for 10 gallons of solution move the decimal point one place to the left; for 1 gallon solution move the decimal point two places to the left.

Disease control: In Table 2 three fungicides stand out as being far more costly than all the others. They are

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Cost of Pesticides (continued)

Plantvax, Milban, and Pipron. Plantvax has a very special use, that is, for controlling rust diseases. Although Plantvax serves as an eradicant and may cause damage to some plants, it is effective in controlling rust diseases. With the introduction of Benlate, and Milban in recent years, Pipron is not used as much as it used to be. Milban, though expensive, is being widely used to control powdery mildew as an eradicant.

Insect control: Table 3 has three insecticides costing more than $7.00 per 100 gallons of water. They are Lannate, Vydate, Pentac, Pramex, Baygon, Resmethrin, Dylox, Cygon and Vendex. Some of these pesticides are relatively new on the market and that may help account for the higher costs.

Effectiveness of materials: It would be interesting to list the effectiveness of kill or effectiveness of control of each of these materials listed in Tables 1, 2 and 3. There are just too many variables to effectively do this. Some of these variables are: differences in application techniques; concentrations used; amount of material on affected areas; solution pH; age of product used; droplet size and a whole host of other factors. So . . . we hope you can better understand how difficult it is to provide this type of information. However, to further help you select materials that will help control various insects, we refer you to Tables 6, 8 and 9 or 'Cornell Recommends, Part II.' Before using any of these materials, you are advised to carefully read the precautions listed on the labels; precautions listed in 'Cornell Recommends' and those listed in other reputable publications.

Real costs: Now, what are the real costs? The real costs involve knowing not only the cost of materials mixed in 100 gallons of water but also all variable costs, overhead operating costs and fixed costs. If you desire help in determining these, we have a form that can be used by growers, which is available on request.

Table 2. Pesticides for controlling diseases, formulations, and costs at recommended rates of application.

Pesticide Fungicides	Formulation	Cost	Rate	Cost/100 gal
Terracior	75 WP	$ 3.50/lb	1½ lb/100	$ 5.25
Ferbam	76 WP	1.70/lb	2 lb/100	3.40
	95 WP	2.20/lb	1 lb/100	2.20
Benlate	50 WP	11.60/lb	½ lb/100	5.80
Lesan	35 WP	11.10/lb	½ lb/100	5.55
Captan	50 WP	1.80/lb	2 lb/100	3.60
Truban	30 WP	16.50/lb	4 oz/100	4.12
			6 oz/100	6.18
Truban	25 EC	27.00/qt	3 oz/100	2.53
			8 oz/200	6.75
Truban	5 G	118/40 lb	10 oz/cu yd	1.84/cu yd
Pipron		76/qt	½ pt/100	19.00
			1 pt/100	38.00
Plantvax	75 WP	16.00/lb	1 lb/100	16.00
			1½ lb/100	24.00
Polyram	80 WP	1.80/lb	2 lb/100	3.60
Kocide 101	77 WP	2.50/lb	1 lb/100	2.50
Triforine		22.00/qt	10 oz/100	6.87
	18.2 EC		12 oz/100	8.25
Zineb	75 WP	2.00/lb	1 lb/100	2.00
Banrot	25 WP	20.50/lb	4 oz/100	5.12
			8 oz/100	10.25
Botran	50 WP		¼ lb/100	
			½ lb/100	
			1 lb/100	
Bravo	75 WP	5.70/lb	1½ lb/100	8.55/100
	3.75 F	39.50/gal	2 pt/100	4.90/100
Exotherm	Smoke	1.54/can	8 oz/10,000 cu ft	1.54/can
Milban	43 EC	57.00/qt	32 oz/100	57.00/100
Folpet	50 WP	2.40/lb	1 lb/100	2.40/100
Karathane	25 WP	3.70/lb	4 oz/100	0.92/100
			6 oz/100	1.38/100
Manzate 200	80 WP	2.00/lb	2 lb/100	4.00/100

Table 3. Pesticides for insect control, formulations, and costs at recommended rates of application.

Pesticide Insecticides	Formulation	Cost	Rate	Cost/100 gal
Kelthane	18.5 EC	$18.80/gal	1 pt/100	$2.35/100
	35 WP	4.10/lb	1 lb/100	4.10/100
			1⅓ lb/100	5.45/100
Malathion	5 E	18.25/gal	1½ pt/100	3.40/100
	25 WP	1.25/lb	2 lb/100	2.50/100
Metaldehyde	15% Dust	1.79/lb	2 lb/1000 ft²	3.58/1000 ft²
Meta-Systox-R	25 EC	30.80/gal	1½ pt/100	5.70/100
Lannate	90 SP	15.30/lb	½ lb Soluble Bag/100	7.60/100
	24 SC	32.65/gal	1 pt/100	4.08/100
			2 pt/100	8.16/100
Methoxychlor	50 WP	3.00/lb	2 lb/100	6.00/100
			3 lb/100	9.00/100
Dibrom	8 E	48.45/gal	1 pt/100	6.00/100
Nicotine	Fumigator	2.92/ 10,000 ft³	12 oz/ 10,000 ft³ can	2.92/ 10,000 ft³
		5.42/ 10,000 ft³	12 oz/ 10,000 ft³ can	5.42/ 10,000 ft³
Vydate	24 SL	37.00/gal	2 pt/100	9.25/100
			4 pt/100	18.50/100
Pentac	50 WP	26.50/lb	½ lb/100	13.25/100
Pramex	13.3 EC	95.00/gal	1 pt/100	11.90/100
			3.2 pt/100	38.00/100
Baygon	70 WP	24.75/lb 1.55/oz	2 oz/gal	309.38/100
Resmethrin	24.3 EC	203.00/gal	1 pt/100	25.37/100
			2 pt/100	50.75/100
	PT 1200 1 lb Aerosol	4.92/ Canister		4.92/lb
	PT 1200 15 lb Aerosol	4.92/ Canister		4.86/lb
Dylox	80 SP	5.00/lb	1½/100	7.50/100
Sevin	50 WP	2.00/lb	2 lb/100	4.00/100
	80 WP	2.90/lb	1¼ lb/100	3.60/100
Diazinon	50 WP	4.05/lb	1 lb/100	4.05/100
	AG 500	34.50/gal	1 pt/100	4.30/100
Cygon	2 E	26.75/gal	2 pt/100	6.70/100
	30.5 EC	34.00/gal	1 pt/100	4.30/100
Disyston	15 G	1.13/lb	20 oz/1000 ft²	1.40/1000 ft²
			40 oz/1000 ft²	2.80/1000 ft²
Thiodan	50 WP	3.91/lb	1 lb/100	3.90/100
3E	33.7 EC	25.70/gal	⅔ qt/100	17.13/100
Enstar	5 E	88/pt	½ pt/100	4.40/100
Guthion SC	22.2 EC	20.00/gal	2 pt/100	5.00/100
	50 WP	5.40/lb	1 lb/100	5.40/100
			2 lb/100	10.80/100
Vendex	50 WP	22.25/lb	½ lb/100	11.13/100
			1 lb/100	22.26/100

Summary: This paper has tried to show costs of commonly used pesticide solutions. They are presented in Tables 1, 2 and 3. Be cautious though, because prices of formulated materials are changing constantly. To help reduce costs in the area of pesticide usage, growers are urged to purchase in case-lot quantities (if usage warrants it); use the most efficient equipment available to apply the least amount of pesticide yet obtain control of pests; use the smallest droplet size possible; treat plants with the proper materials to avoid damage; and apply the materials at the recommended environmental conditions.