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MINNESOTA STATE FLORISTS' Bulletin

Agricultural Extension Service
University of Minnesota
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The Following Reviews were prepared by Dr. L. Dosdall of the Department of Plant Pathology.

BACTERIAL STEM ROT AND LEAF SPOT OF PELARGONIUM

Dr. Donald E. Munnecke in California and Dr. Ernst Hellmers in Copenhagen, Denmark, have reported recently on their investigations concerning this destructive disease. Dr. Munnecke found none of the commercial varieties immune to greenhouse inoculations but some of the varieties are more susceptible than others. Several California growers rated their varieties as follows:

Most susceptible	Most resistant
Radio Red	Improved Ricard
Olympic Red	Red Landry
Pink Fiat	Red Fiat
Apple Blossom	Salmon Ideal
Irvington Beauty	Salmon Supreme
Enchantress Fiat	Better Times
Ruby	
Montmort	

In the greenhouse inoculation tests, Radio Red was most susceptible. Salmon Supreme and Better Times were most resistant.

In California field soils, the bacteria did not live much more than three months when no geraniums were grown in the soil. The bacteria are carried over to a high degree in the cuttings taken from diseased plants and the bacteria spread rapidly in the cutting bench from diseased to healthy cuttings. The most efficient way in spreading the bacteria is by means of the cutting knife. Dr. Munnecke recommends using two knives, carrying them in a 1:1000 mercuric chloride solution, and using a fresh knife for each cut. The knife should be wiped off each time before use. The disease is spread rapidly by overhead watering.

The only practical control measure for this disease, says Dr. Munnecke, is through the establishment and maintenance of disease-free propagative stock grown under strict sanitary procedure.

Disease-free stock is being developed for several of the commercial varieties by a "culture method" similar to that used for chrysanthemums and carnations.

Dr. Hellmers' findings agree very closely with those of Dr. Munnecke. The former recommends using healthy parent plants, growing the plants in sterilized soil, keeping the above-ground parts of the plants as dry as possible, keeping plants well spaced and avoiding splashing. Some degree of success in control of the disease in the greenhouse was obtained by weekly sprayings with 1 per cent Bordeaux mixture beginning in the cutting bed.

References

1. Munnecke, D. E. and P. A. Chandler. Disease free geraniums. Florists' Review 116 (3004): 23, 67-68. 1955.
2. Munnecke, D. E. Bacterial stem rot of Pelargonium. Phytopathology 44:627-632. 1954.
3. Hellmers, E. Bacterial leaf spot of Pelargonium in Denmark. Trans. Danish Acad. Tech. Science N. 4, pp. 1-40. 1952.

BULLHEADING OF ROSES

D. C. Kiplinger and Chiko Haramaki report in the May-June, 1955, issue of Ohio Farm and Home Research that malformation or "bullheading" of the buds in the rose varieties Better Times, Golden Rapture, Talisman, Briarcliff, Cavalier, Snow White and Starlite is not inherited.

Individual production records were kept on 224 plants of Better Times for a two-year period. The percentage of malformed flowers varied from 0 to 50 the first season and 0 to 59 the second. In only two cases, plants which produced a low percentage of malformed flowers the first year also produced a low percentage the second year. The same relationship held for plants producing a high percentage of malformed flowers both years. Some plants that were in the highest percentage group the first year were in the lowest the second year.

HELPFUL INFORMATION FOR YOUR FILES

FUNGICIDES

Common Name	Commercial Name
Ferbam	Fermate
	Karbam
	Nu-Leaf Black
	Ferradow
	Carbamate
Zineb	Parzate
	Dithane Z-78
	Ortho Zineb
	Thiodow Powder

Ziram	Zerlate Karbam White Opalate White
Captan	Captam Fungicide Orthocide
Nabam	Dithane D14 Ortho Nabam Parzate Liquid Thiadow-Liquid
Thiram	Terasan Arasan

Amount to use

Material	1 gal.	5 gal.	100 gal.
Bordeaux (4-4-100)	3 T	1 cup	3 lb.
Captan	3 T	1 cup	3/4 lb.
Fixed coppers (50 per cent metallic)	2 T	2/3 cup	2 lb.
Ferbam	1 1/3 T	1/2 cup	1 1/2 lb.
Liquid lime sulfur	5 T	1 2/3 cup	2 gal.
Mathieson 466	--	--	1/2 lb.
Mildex	2/3 T	1/4 cup	6 oz.
Wettable sulfur	2/3 T	1/4 cup	1 lb.
Zineb (Dithane Z-78)	1 T	1/3 cup	1 1/2 lb.
Zineb (Parzate)	2 T	2/3 cup	1 1/2 lb.
Ziram	2 T	2/3 cup	1 1/2 lb.

AEROSOL BOMBS

Material	Name of bomb and companies producing them:		
	Edco Corp. Elkton, Md.	Plant Products Blue Point, Long Island, New York	Virginia Smelting Co. West Norfolk, Virginia
TEPP	Tetravapor	TEPP	G52
DDT	Multivapor 104	DDT	G53
Parathion	Thionvapor	Plant-thion	G54
Dithio	Dithion Vapor	Plant-dithio	G57
Ovotran	K vapor	Plant-miticide	G58
OMPA	Octavapor	OMPA	G59
Aramite	Aravapor	Aramite	G60
Aramite and Lindane	Lindamite	Aramite and Lindane	G61
Malathion	Malathion	--	G62
Systox	--	Plant Systox	--
Chlorobenzilate and Systox	--	Plant-Phos	--
Chlorobenzilate and OMPA	--	--	G63
Aramite and OMPA	Octamite vapor	--	--

INSECTICIDES

Amount to use

Material*	1 gal.	5 gal.	100 gal.
Aldrin 25WP	1 T	1/3 cup	1 lb.
Aramite 15WP	1 T	1/3 cup	1 1/2 lb.
Chlordane 50WP (inside)	1 T	1/3 cup	1 lb.
Chlordane 50WP (outside)	2 T	2/3 cup	2 lb.
Chlorobenzilate 25WP	2/3 T	1/4 cup	1 lb.
DDT 50WP (inside	1 1/3 T	1/2 cup	1 lb.
DDT 50WP (outside)	2 2/3 T	1 cup	2 lb.
Dieldrin 25WP	1 T	1/3 cup	1 lb.
Dimite 40WP	2 T	2/3 cup	2 1/2 lb.
Endrin 19E	2/3 T	1/4 cup	1 qt.
Lindane 25WP	2/3 T	1/4 cup	3/4 lb.
Malathion 25WP	2 T	2/3 cup	2 lb.
Methoxychlor 50WP	2 T	2/3 cup	2 lb.
Mildex 25WP	1/3 T	1 T and 1 t	1/2 lb.
Nicotine sulfate	1/2 T	2 1/2 T	3 cups
OMPA 70E	1/3 T	1 2/3 T	1 pint
Ovotran 50WP	2 T	2/3 cup	1 1/2 lb.
Parathion 25WP (inside)	2/3 T	1/4 cup	1 lb.
Parathion 25WP (outside)	1 T	1/3 cup	1 1/2 lb.
Systox 50E	1/2 T	2 1/2 T	1 1/2 pints

* The number after the name refers to the percentage of the active material WP= wettable powder: E= emulsifiable or liquid; T= level tablespoon.

LIQUID MEASURE

Dilution Rate	Amount to use in following quantity of water					
	1 gals.	3 gals.	10 gals.	20 gals.	50 gals.	100 gals.
1 to 20	13 T	1¼ pts.	2 qts.	1 gal.	2½ gals.	5 gals.
1 to 25	10 T	1 pt.	3 pts.	3 qts.	2 gals.	4 gals.
1 to 50	5 T or 2½ oz.	1 cup or 8 oz.	3 cups or 1½ pts.	3 pts.	1 gal.	2 gals.
1 to 100	2½ T or 1¼ oz.	½ cup or 4 oz.	1½ cups or 13 oz.	3 cups or 1½ pts.	2 qts.	1 gal.
1 to 200	4 tsp.	4 T or 2 oz.	3/4 cup or 6½ oz.	1½cups or 13 oz.	1 qt.	2 qts.
1 to 400	2 tsp.	2 T or 1 oz.	6½ T or 3¼ oz.	3/4 cup or 6½ oz.	2 cups or 1 pt.	1 qt.
1 to 600	1¼ tsp.	4 tsp.	4½ T or 2¼ oz.	½ cup or 4½ oz.	1 1/3 cups or 11 oz.	2 2/3 cups or 1 1/3 pts.
1 to 800	1 tsp.	1 T	3¼ T or 1 2/3 oz.	6½ T or 3¼ oz.	1 cup or 8 oz.	2 cups or 1 pt.
1 to 1000	3/4 tsp.	2¼ tsp.	2½ T or 1¼ oz.	5 T or 2½ oz.	3/4 cup or 6½ oz.	1½ cups or 13 oz.
1 to 1600	½ tsp.	1½ tsp.	5 tsp. or 3/4 oz.	3 1/3 T or 1 2/3 oz.	½ cup or 4 oz.	1 cup or 8 oz.
1 to 2000	1/3 tsp.	1 tsp.	4 tsp. or 2/3 oz.	2½ T or 1¼ oz.	6½ T or 3¼ oz.	3/4 cup or 6¼ oz.
1 to 3200	¼ tsp.	3/4 tsp.	3/4 T	1½ T or 3/4 oz.	4 T or 2 oz.	½ cup or 4 oz.

1 gallon = 4 quarts
1 quart = 2 pints
1 quart = 946.33 cc
1 pint = 16 fluid ounces
1 cup = 8 fluid ounces
1 fluid ounce = 2 tablespoons
1 tablespoon = 3 teaspoons
1 teaspoon = 80 drops

DRY MEASURE

3 level teaspoons = 1 tablespoon
16 level tablespoons = 1 cup
2 cups = 1 pint
2 pints = 1 quart
8 quarts = 1 peck
4 pecks = 1 bushel

Capacity of clay flower pots

2-inch pot = 1/3 cup
2½-inch pot = 2/3 cup
3-inch pot = 1 cup
4-inch pot = 2½ cups
5-inch pot = 4½ cups
6-inch pot = 8 cups = 2 qts.

One bushel of potting soil is needed for:

1,009 1½-inch pots
587 1 3/4-inch pots
414 2-inch pots
370 2¼-inch pots
220 2½-inch pots
149 3-inch pots
82 3½-inch pots
54 4-inch pots
29 5-inch pots
17 6-inch pots
11 7-inch pots

Average steel wheelbarrow = 2¼ cubic feet level or 3 cubic feet heaped.

AREA MEASUREMENT

144 square inches = 1 square foot
9 square feet = 1 square yard
30¼ square yards = 1 rod or 1 perch
160 square yards = 1 acre
640 acres = 1 square mile
1 acre = 43, 560 square feet

One cubic yard of loose moist manure = approximately 650 pounds

INVITATION

The department of horticulture maintains a large planting of garden chrysanthemums on the St. Paul Campus. These plantings, which include hundreds of named varieties and thousands of unnamed varieties, are a part of the breeding program conducted at the University.

All florists interested in garden chrysanthemums are invited to visit the University plots at their convenience. The greatest number of plants are usually in bloom during the month of September.

MEETINGS

Minnesota Commercial Flower Growers' Committee
* Details to be announced — August 16
* Details to be announced — September

St. Paul Florists' Association
* Details to be announced — September

Wholesale Florists' Association of Minneapolis
* Details to be announced — August 22
* Esslingers Cafe, St. Paul — September 20

In this Issue

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