Vegetables – Commercial Greenhouse Tomatoes

Certain cultural practices play a significant role in reducing or eliminating many insect problems in greenhouses. The following cultural practices will aid in the control of insect pests:

1. Maintain a clean, closely mowed area adjacent to the greenhouse.
2. Dispose of any trash, boards or old plant debris in the area.
3. Keep doors, screens and ventilation fan screens in good repair.
4. Use clean sterile soils, tools, flats and other equipment.
5. At the conclusion of the season remove all plants and any plant debris, clean greenhouse thoroughly and fumigate. (See Insecticide Use Suggestions) "An ounce of prevention is worth a pound of cure."

Chemical Safety in the Greenhouse

When used as recommended on the labels, pesticides are safe and effective. All pesticides are poisonous, however, and if misused, they may be hazardous to humans and animals and also may contribute to the pollution of the environment.

Before using any pesticide, read the label in its entirety. Note any special precautions such as the necessity of wearing special protective clothing when applying the chemical. Follow all safety precautions set forth on the label. The following suggestions will aid in developing safe pesticide-use practices in greenhouses.

1. Become familiar with the use of a pesticide before using it. Know its toxicity and the necessary precautions for its safe use.
2. Keep all safety equipment such as facemasks, respirators and protective clothing on hand and in good working order.
3. When mixing pesticides use a well-ventilated area or mix outdoors. Avoid contact with skin and do not breathe vapors.
4. Do not save used pesticide containers. Dispose of old containers properly.
5. Store all pesticides in a secure place away from pets, children and unknowledgeable persons. Never store pesticides in unmarked containers.
6. Post caution signs during fumigation and after treatment of greenhouse to avoid contact with chemicals.
7. Apply correct dosage of the pesticide. Using less than the correct amount may result in poor control of the pest. Using more than the correct amount may result in excessive residue or damage to plants.
8. Obey specified time intervals between treatments and cutoff dates before harvest. A failure to observe these restrictions may result in excessive residue or damage to plants.
9. The use of certain chemicals may be phytotoxic to some varieties of plants. This should be checked before using a chemical.
10. Special restrictions apply to greenhouses connected to living quarters. Read label restrictions where this applies and follow all restrictions carefully.

Table of Measures	
Liquid:	Weight:
1 level tablespoon = 3 level teaspoonfuls	1 ounce = 28.3 grams
1 fluid ounce = 2 tablespoons = 29.57 milliliters	1 pound = 16 ounces = 454 grams
1 cupful = 8 fluid ounces	1 ton = 2,000 pounds
1 pint = 2 cupfuls = 16 fluid ounces	
1 quart = 2 pints = 32 fluid ounces	
1 gallon = 4 quarts = 128 fluid ounces	

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Greenhouse Dilution Tables

Wettable Powders

Number of ounces of wettable powder to use in small sprayers when amount per 100 gallons is known:

100 gallons	10 gallons	5 gallons	2 gallons	1 gallon
0.5 pound	0.8 ounce	0.4 ounce	0.2 ounce	0.1 ounce
1.0 pound	1.6 ounces	0.8 ounce	0.3 ounce	0.2 ounce
2.0 pounds	3.2 ounces	1.6 ounces	0.6 ounce	0.3 ounce
3.0 pounds	4.8 ounces	2.4 ounces	1.0 ounce	0.5 ounce
4.0 pounds	6.4 ounces	3.2 ounces	1.3 ounces	0.6 ounce
5.0 pounds	8.0 ounces	4.0 ounces	1.6 ounces	0.8 ounce

Emulsifiable Concentrates

Number of fluid ounces of emulsifiable concentrate to use in small sprayers when amount per 100 gallons is known:

100 gallons	10 gallons	5 gallons	2 gallons	1 gallon
1 pint	1.6 fluid ounces	0.8 fluid ounce	0.3 fluid ounce	0.2 fluid ounce
1 quart	3.2 fluid ounces	1.6 fluid ounces	0.7 fluid ounces	0.3 fluid ounce
2 quarts	6.4 fluid ounces	3.2 fluid ounces	1.3 fluid ounces	0.6 fluid ounce
1 gallons	12.8 fluid ounces	6.4 fluid ounces	2.6 fluid ounces	1.3 fluid ounces

Mist Blower

Quantity of emulsifiable concentrate (EC) needed to make a 25X concentrate:

If amount per 100 gallons for a high volume spray is:	Use this amount in a 25 gallon mist blower	Use this amount in a 10 gallon mist blower	Use this amount in a 2 gallon mist blower	Use this amount in a 1 gallon mist blower
1 pint	6.25 pints	2.5 pints	8.0 fluid ounces	4.0 fluid ounces
1 quart	6.25 quarts	5.0 pints	1.0 pint	8.0 fluid ounces
2 quarts	3.13 gallons	5.0 quarts	1.0 quart	1.0 pint
1 gallons	6.25 gallons	2.5 gallons	2.0 quarts	1.0 quart

Your county agent can give you further help with dilutions. Visit www.lsuagcenter.com.

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Pesticide Recommendations

Insect	Insecticide and Formulation	Amount of Formulation	Re-entry Interval	Preharvest Interval	Precautions and Remarks
Aphid	Imidacloprid (Admire pro) 4.6F	0.6 fl. oz./1,000 plants	12 hours	0	Apply in minimum of 21 gal. water using soil drenches or drip irrigation. Do not apply to immature plants. Make only one application per crop per season.
	Insecticidal Soap (M-Pede) 49EC	2 tbsp./gal. water	12 hours	0	May be used alone or in combination. Acts as an exciter.
	Malathion (various) 10 A 57 EC 25 WP	1lb./50,000 cu.ft. 1qt./100 gal. water 4lb./100 gal. water	12 hours	15 hours 1 day 1 day	
Broad mite, russet mite, spider mite	Bifenazate (Floramite) SC	4-8 fl.oz/100 gal. water 1/4 to 1/2 tsp./gal. water		3 days 3 days	Not for russet mite. For use on tomatoes greater than1 inch diameter at maturity. Not registered on pepper.
	Insecticidal Soap (M-Pede) 49EC	2 tbsp./gal. water	12 hours	0	
	Mineral Oil (Tri Tek)	1 to 2 gal./100 gal water		0	Begin applications when mite populations are low; repeat at weekly intervals.
Caterpillars: armyworm, cabbage looper, catworm, fruitworm	Bacillus Thuringiensis (various)	See label	4 hours	0	
	Chlorfenapyr (Pylon) 2SC	6.5 to 13 oz./100 gal. water or per acre area		0	For use on tomatoes more than 1 inch in diameter at maturity. Do not make more than 2 applications at 5- to 10-day intervals.
	Malathion(various) 10 A 57 EC 25 WP	1lb./50,000 cu.ft. 1qt./100 gal. water 4qt./100 gal. water	12 hours	15 hours 1	Hazardous to honey bees.
	Spinosad Entrust SC	3 fl.oz./100 gal	4 hours	1 day	Do not make more than 2 consecutive applications. Do not apply to seedling tomatoes or peppers grown for transplants.
Cricket, millipede	Malathion (various) 5D	Follow label	12 hours		Apply to soil at base of plants, Do not contaminate fruit.
leafminer	Malathion (Various) 10A	1lb./50,000 cu.ft.	12 hours	15 hours	See aphid.
	Spinosad (Entrust) SC	10 fl.oz/100 gal	4 hours	1 day	Do not apply to seedlings grown for transplants.
Slug	Metaldehyde (various)	Follow label			Apply to soil surface around plants. Do not contaminate fruit.
Thrips	Chlorfenapyr (pylon) 2SC	9.8 to 13 fl.oz./gal. water or per acre area		0	For use on tomatoes more than 1 inch at maturity. Do not make more than 2 applications at 5- to 10- day intervals.

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Pesticide Recommendations					
Insect	**Insecticide and Formulation**	**Amount of Formulation**	**Re-entry Interval**	**Preharvest Interval**	**Precautions and Remarks**
	Spinosad (Entrust) SC	5.5 fl. oz./100 gal. water	4 hours	1 day	Do not make more than 2 consecutive applications and do not apply more than 6 times in a 12-month period against thrips. Do not apply to seedlings grown for transplants.
Whitefly	Buprofezin (talus) 40SC	9 to 13.6 oz./100 gal. water or per acre area		1 day	Insect growth regulator that affects immature stages of Whiteflies will not kill adults. For use on tomatoes only.
	Imidacloprid (Admire pro) 4.6F	0.6 fl. oz./1,000 plants	12 hours	0	Apply in minimum of 21 gal water using soil drenches or drip irrigation. Do not apply to immature plants. Make only 1 application per crop per season.
	Insecticidal soap (M-pede) 49EC	2 tbsp./gal. water	12 hours	0	
	Pyrethrins and PBO (pyrenone)	12 oz./20 gal. water		0	May be used alone or tank-mixed with a companion insecticide.
	Pyriproxyfen (distance) 0.86EC	6 fl. oz./100 gal. water		14 days	Insect growth regulator that affects immature stages of whiteflies; will not kill adults.

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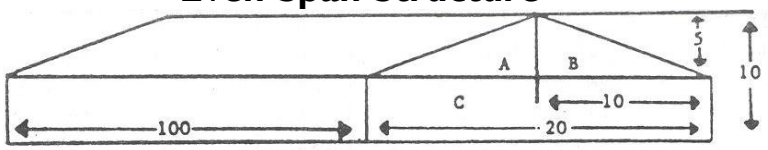
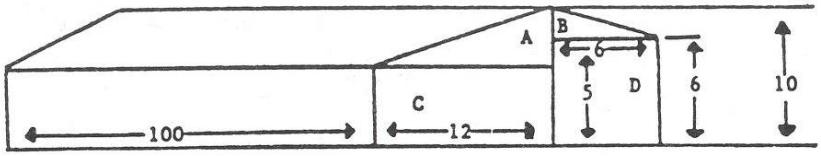
CALCULATION OF GREENHOUSE VOLUME

Even Span Structure



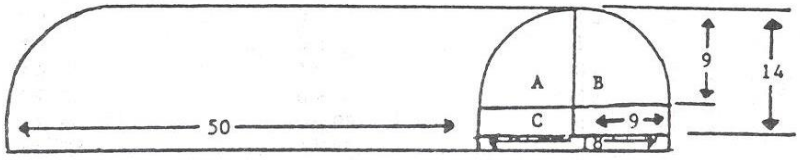
Area A and B = .5(5 x 10) = 25
Area C = 20 x 5 = 100
Total Area = A + B + C = 100 + 25 + 25 = 150
Volume = Length + Total Area = 100 x 150 = 15,000 cu.ft.

¾ Span House



Area A = .5(12 x 5) = 30
Area B = .5(4 x 6) = 12
Area C = 6 x 6 = 36
Total Area = A + B + C + D = 30 + 12 + 60 + 36 = 138 sq.ft.
Volume = Length x Total Area = 100 x 138 = 13,800 cu.ft.

Roundtop Structure



Area A + B = .5(r2) = 127
Area C = 5 c 18 = 90 sq.ft.
Total Area = A + B + C = 127 + 90 = 217
Volume = Length x Total Area = 50 x 217 = 10,850 cu.ft.