## IPM for Greenhouse Tomato Production



Rich Trinklein Trinklein Greenhouses







### **Presentation Overview**

IPM concept

- History of Trinklein Greenhouses (or 54 years of battling pests)
- Key components of present IPM practices
- Conclusions



## Integrated Pest Management (IPM)







## What IPM is <u>NOT</u>!

- IPM does <u>NOT</u> preclude the use of pesticides
- IPM is <u>NOT</u> merely a biological or "organic" pest control program
- IPM <u>NOT</u> a stringent, rigid management regime
- IPM <u>IS</u> a flexible process based on keen observation and decision making



## **Brief History of Operation**









## Current Production Practices

















## **54 Years of Battling Pests**

Growing Protocol	Key Pests	Solution(s)
Field tomatoes	Early blight	Grow under plastic



## Key Components to Current IPM Program

# Planning – Keep good records to update protocols yearly





Physical barriers

- Screen all vents
- Maintain buffer strips outside





Concrete floors
Best investment we ever made!





#### Sanitation

- Remove plants/media between crops
- Disinfect with bleach and laundry detergent







#### Scouting

- Delegate employees who handle plants on daily basis
- Offer bonuses







Encourage visitors

- Clean up when company is coming
- See your operation through eyes of others





#### **Seedling Stage**

Problem Mice

#### <u>Treatment</u> Bar bait Mouse traps Pet cat





#### **New Transplant Stage**

ProblemTreatmentDamping offZerotol®, Rootshield®MiceSame as previousThripsLeaf removal (LR)WhiteflyAir blast (fan)CutwormsHand picking



IPM Practices by Production Stage			
Early Production Stage			
Problem	<u>Treatment</u>		
Stem rot	Banrot <sup>®</sup> drench		
Thrips	Conserve <sup>®</sup> , Sevin <sup>®</sup>		
Cut worms	Hand picking		



IPM Practices by Production Stage		
Fruiting Stage		
<u>Problem</u>	<u>Treatment</u>	
Pinworms	LR, bug zapper, Conserve <sup>®</sup> pheromone traps	
Whitefly	LR, <i>Encarsia formosa</i>	
Aphids	LR, indicator plants, fumigants, sprays	
Spider mites	Indicator plants, paraffinitic oil, Floramite <sup>®</sup>	
Cut worms	Bug zapper, Sevin®	

#### **Post-harvest Stage**

Problem	<u>Treatment</u>	
Fruit fly	Sticky tape; jar traps	
Fruit rot	Air movement, sunlight, bleach	



## Conclusions

Pest control perhaps greatest challenge for tomato production

For most problems there is no single solution

IPM strategy is to employ a combination of tactics, used as needed



## **Questions?**





## Philosophies

#### **Conventional Control**

- > Eradicate pests
- Single pest approach
- Preventative or calendar spraying
- Whole area treatment
- Broad-spectrum pesticides

Manage pests

IPM

- Whole system approach
- Combination of tactics (as needed)
- Individual plants (groups)
- Narrow range (specific) control measures

## Components of an IPM Program

Prevention (exclude pests when possible) Monitoring and Sampling (inspect) Pest Identification (what pest) Decision-making (what action) Intervention (take action) Follow-up (re-inspect) Record-keeping (write it down, history) Education (learn)

Stage	Pest	Treatments
Seedling	Mice	Bar bait Mouse traps Greenhouse pet cat



Stage	Pest	Treatments
New transplants	Damping off Mice Thrips Whitefly Cutworms	Zerotol, Rootshield plus Same as previous



Stage	Pest	Treatments
Early production stage	Stem rot Thrips Cut worms	Banrot drench Conserve, Sevin Hand picking



Stage	Pest	Treatments
Fruiting plants	Pinworms	Leaf removal (LR), bug zapper, pheromone traps, Conserve
	Whitefly	LR, Encarsia formosa
	Aphids	LR, indicator plants
	Spider mites	Indicator plants Paraffinic oil, Floramite
	Cutworms	Bug zapper, Sevin



Stage	Pest	Treatments
Post-harvest	Fruit fly	Sticky tape Jar traps
	Mold	Air movement Sunlight Bleach

