

# Pepper IPM Elements

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The purpose of this document is to consolidate current Ohio information on Integrated Pest Management (IPM) in the form of general working practices or tactics for a specific crop. The second intent is to use this checklist as an evaluation instrument for growers applying to conservation programs such as Environmental Quality Incentives Program (EQIP). This document is intended to help growers identify areas in their production system that possess strong IPM qualities and also point out areas for improvement.

Growers should review the seven sections of this document and indicate which practices they **currently use** on this crop in their operation. There is a point value associated with every IPM practice; the higher the number, the greater the relative importance of the practice. After going through the list, add the associated values for each section to get the **Baseline IPM Score**. Growers will complete this evaluation every year of their contract, and maintain at least 60% of the total points available each year of the contract to be considered in compliance and eligible for a payment.

## **Major Pests of Peppers - Primary concerns are insects, diseases, and weeds**

<b>Insects</b>	<b>Diseases</b>	<b>Weeds</b>
European corn borer	Damping off	Annual grasses
Cutworms	Cucumber Mosaic Virus (CMV)	Annual broadleaf weeds
Aphids	Tomato Mosaic Virus (TMV)	Perennial weeds
Fall armyworm	Tomato Spotted Wilt Virus (TSWV)	
Hornworms	Bacterial spot	
Mites	<i>Phytophthora</i> blight	
Whitefly	Anthracnose	
Flea beetles	Early blight	
Stink bugs	<i>Phomopsis</i> blight	
Beet armyworm	Nematodes	
Pepper maggot		

## Educational IPM Considerations

Place a check mark in the right hand column for activities currently used or expected to adopt on your farm.

Activity	Points	IPM Score			
		Baseline	1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr
Join local or state grower associations that handle this commodity.	5				
Attend winter or summer educational meetings or field days annually to keep current on pest management recommendations.	10				
Access University based vegetable information websites for research based information	5				
Obtain the latest Ohio Vegetable Production Guide (Bulletin 672) and other commodity specific reports / production guides.	10				
Subscribe to "free" VegNet newsletter for updates on disease, insect, and weed development, plus management options during the growing season.	10				
Research alternative markets that encourage less pesticide use either through specific use reduction requirements (organic, eco-, IPM labels) or simply by permitting more insect feeding, etc.	5				

**Your section total is \_\_\_\_\_pts.**

## Pesticides and Record Keeping

Place a check mark in the right hand column for activities currently used or expected to adopt on your farm.

Activity	Points	IPM Score			
		Baseline	1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr
Calibrate insecticide and fungicide sprayer at least once a year.	10				
Calibrate herbicide sprayer at least once a year.	10				
Use drift control nozzles for pesticide applications	10				
Maintain accurate and organized spray records.	15				
Maintain accurate records of planting dates, field locations, varieties, and fertilizer applications.	10				
Analyze spray records to determine Environmental Impact Quotient.	10				
Among pesticides of comparable efficacy, use the one with the lowest Environmental Impact Quotient.	10				

**Your section total is \_\_\_\_\_pts.**

## Pre-plant IPM Considerations

Place a check mark in the right hand column for activities currently used or expected to adopt on your farm.

Activity	Points	IPM Score			
		Baseline	1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr
Soil test annually; amend soil with fertilizer or compost according to guidelines and yield of crop. ( <b>Nutrient Management – 590</b> )	15				
Adjust mineral soil pH to 6.0-6.8.	15				
Apply 100% of P and K according to soil test.	15				
Adjust N application to account for any N given by cover crop, compost or other sources of organic nitrogen.	10				
Apply 1/2 of the nitrogen fertilizer pre-plant. Use a starter fertilizer solution high in phosphorus at the time of transplanting, very important to early flowering and yield. Apply remaining nitrogen fertilizer after fruit set or at regular intervals through through trickle irrigation	10				
Select a well drained, friable, warm non-acidic site.	15				
Use raised beds (12-18 inches high) to reduce disease incidence. ( <b>Bedding – 310</b> )	15				
Buy fungicide treated seed to protect against seedling diseases.	15				
Treat seed with dilute Clorox solution for control of bacterial diseases according to guidelines in Ohio Vegetable Production Guide (Bulletin 672).	10				
Select hybrids well adapted for your growing area with good tolerance or resistance to Phytophthora, Cucumber Mosaic Virus, Tomato Mosaic Virus, and Tomato Spotted Wilt Virus.	15				
Verify transplants are healthy and disease free prior to acceptance.	15				
Select transplants grown in isolation from ornamental crops to avoid TSWV.	15				
Practice weed seed exclusion tactics such as high pressure washing machinery shared between farms.	15				
Buy certified seed and weed free soil mixtures; determine weed seed content of all seed and do not plant seed contaminated with weed seed not known to occur on your farm.	15				
Use site free of perennials such as quack grass, Johnson grass, Yellow nutsedge, or Canada thistle if possible.	15				
Use a combination of fall/spring tillage and fall/spring application of a broad spectrum herbicide to control established perennials or rotate with a herbicide resistant crop on which a broad spectrum herbicide was used.	15				

Apply pre-plant herbicides to control seedling broad leaf weeds and annual grasses if necessary.	15				
Use stale seed bed technique.	10				
Select properly rotated site at least 3 years away from vine and solanaceous crops. ( <b>Conservation Crop Rotation – 328</b> )	15				
Use drip tape and plastic mulch. ( <b>Micro irrigation - 441</b> )	15				
Control of thrips in greenhouse is essential to slow spread of Tomato Spotted Wilt Virus.	15				

**Your section total is \_\_\_\_\_ pts.**

### **At-planting IPM Considerations**

Place a check mark in the right hand column for activities currently used or expected to adopt on your farm.

Activity	Points	IPM Score			
		Baseline	1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr
Apply pre-emerge herbicide after planting for control of annual grasses and broadleaf weeds.	10				

**Your section total is \_\_\_\_\_ pts.**

## In-season IPM Considerations

Place a check mark in the right hand column for activities currently used or expected to adopt on your farm.

Activity	Points	IPM Score			
		Baseline	1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr
Control nearby weeds such as pokeweed, Apple of Peru, pigweed species, or abandoned tomato, cucumber, squash, and melon fields that may harbor virus potentially vectored to crop by either aphids or thrips.	10				
Control Horsenettle for pepper maggot prevention.	5				
Use cultivation to control weeds.	10				
Apply post emerge products, using directed or shielded sprays to control remaining weeds.	10				
Update field weed maps, use to make treatment decisions next season.	15				
Watch for weeds that are not common or are new to the field, consider adopting a zero threshold for these weeds and physically remove them in order to prevent seed production.	15				
Control of thrips in field is essential to slow spread of Tomato Spotted Wilt Virus.	15				
Set up pheromone traps for European corn borer (ECB) and check twice per week; if fruit are present begin protective sprays when trap catches begin to increase, stop when trap activity declines to <1 moth per night.	15				
Set up pheromone traps for Corn earworm, Fall armyworm, and Beet armyworm. Spray insecticides if these pests are active and field is not already on schedule for ECB.	15				
Scout for aphids and other misc. pests weekly particularly in first half of season when ECB not a problem.	15				
Use selective insecticides listed in OVPG to minimize impact on natural enemies.	5				
Remove and destroy all diseased plants from field.	15				

**Your section total is \_\_\_\_\_ pts.**

## Harvest IPM Considerations

Place a check mark in the right hand column for activities currently used or expected to adopt on your farm.

Activity	Points	IPM Score			
		Baseline	1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr
Remove and destroy all diseased and cull fruit from field.	15				

**Your section total is \_\_\_\_\_ pts.**

## Post-Harvest IPM Considerations

Place a check mark in the right hand column for activities currently used or expected to adopt on your farm.

Activity	Points	IPM Score			
		Baseline	1 <sup>st</sup> Yr	2 <sup>nd</sup> Yr	3 <sup>rd</sup> Yr
Plow down residue as soon as possible after harvest to reduce weed residue, fungal inoculum, and insect over wintering locations.	15				
Evaluate new IPM practices used on the farm this year, even if used on limited acreage. Implement successful practices over greater acreage next season.	10				
Plant cover crops soon after crop is harvested. ( <b>Cover Crops – 340</b> )	15				
Update field weed maps, use to make treatment decisions next season.	15				
Control weeds after harvest to prevent further growth and seed production.	15				

Your section total is \_\_\_\_\_ pts. Total points for Element is 655.

**Baseline IPM Score** (Add the scores of the previous 7 sections) \_\_\_\_\_

End of Year 1 at least **60% of total IPM Element points** \_\_\_\_\_

End of Year 2 at least **60% of total IPM Element points** \_\_\_\_\_

End of Year 3 at least **60% of total IPM Element points** \_\_\_\_\_