

Seasonal Integrated Pest Management Checklist for Orchards



Integrated pest management (IPM) helps growers use pesticides wisely in combination with other approaches to minimize economic, health and environmental risks. IPM provides a system for growers to use knowledge instead of just pesticides to control pest problems. To make good choices about control, growers need knowledge gained from training and observations in the field. This includes education about pest life cycles, scouting for pests and the impact of pesticides. IPM's systematic approach helps growers use information to make sound decisions about pest control that take into account cost, effectiveness, resistance management and potential environmental impacts. IPM emphasizes a range of options to prevent pest problems – including solutions based on mechanical (e.g., mowing or pruning) or cultural practices (e.g., planting cultivars that match site conditions or are disease resistant). With improved spray timing, IPM enables growers to use pesticides more efficiently, effectively and safely. Growers can reduce or eliminate practices such as application of broad-spectrum pesticides that disrupt natural processes for controlling pests.



The Seasonal IPM Checklist is designed to help growers evaluate management practices that may increase the options available for pest management. This can make pest control less expensive, more effective, and/or less toxic for humans and the environment. In most orchards some type of integrated pest management is already practiced. The checklist in this bulletin categorizes these practices according to seasons of the year. It helps the grower determine which practices have already been implemented, and where the addition of other IPM practices may be beneficial. Space is provided to indicate when practices have been adopted and for notes about future management changes. The last page of the checklist is an IPM scorecard where each season can be evaluated for degree of IPM adoption.

1.0 Preseason IPM Activities — December through March	Adopted (date)
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Review previous season's data on pest populations, pesticide usage, fruit injury and note defects for each management unit (e.g., orchard block), recording percentage of defects for key pests and disorders.

Use results from the packout survey to adjust management plans for the coming season.

Prepare a written IPM plan specific to your farm using the information taken from this checklist. List key pests, monitoring techniques to be used, monitoring schedule and person responsible for each technique. Review and update the plan annually.

Complete annual dormant pruning to ensure adequate air circulation, sunlight and spray material penetration and sufficient alleyway width for equipment without damage to fruit and foliage. Prune out last season's fire blight strikes.

Monitor orchards for deer feeding. Place and/or maintain deer repellents and/or fencing as needed. Obtain necessary DNR block permits.

Inspect tree trunks for dogwood borer, American plum borer and greater and lesser peach tree borer damage.

Inspect all chemical application equipment and clean and repair as needed.

Inspect weather-monitoring equipment; clean, repair, replace or obtain as needed.

Assess IPM monitoring product and service needs, as well as pollination service needs. Order supplies and services as needed.

Attend IPM educational meetings. Identify at least one new IPM technique each year and adopt the technique on a trial basis in part of your operation. Consider adopting new methods in a few blocks and comparing results to similar plantings under grower standard management program.

Gather information on new pesticide registrations or changes in current registrations.

Review pesticide class selection from previous year and plan rotation for coming season (resistance management).

Number of practices adopted (enter here and on IPM scorecard, page 7)	Total
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2.0 Late-dormant IPM Activities — March to Silver Tip Bud Stage **Adopted (date)**

Calibrate all application equipment.

Sample trees for European red mite and aphid eggs. Determine which blocks require a horticultural oil application based on sampling results and block history of mite, scale and aphid infestations.

Begin monitoring for tarnished plant bug in orchards with a history of this pest.

Apply fertilizer according to soil and prior season foliar analysis results. Split applications of N are recommended to protect groundwater. Second application to be made late spring/early summer, if needed.

Scout orchard for vole activity and assess damage to trunks. Purchase or build kestrel houses.

Adjust size and shape of the spray pattern to match tree size and shape.

Start monitoring program to determine the strategies for controlling apple scab.

Remove prunings from orchard.

Number of practices adopted (enter here and on IPM scorecard, page 7) **Total**

3.0 Prebloom IPM Activities — Green Tip through Pink Bud Stages

Begin weekly or more frequent monitoring of orchard blocks to determine growth stage, pest activity and weather.

At pink, place pheromone traps for codling moth in orchard blocks.

Prior to pink, place traps for oriental fruit moth in orchards with a history of this pest and begin checking weekly. Establish biofix (at first sustained catch) and initiate degree day model.

Begin sampling for spotted tentiform leafminer eggs on underside of leaves. Make treatment decisions based on sampling results prior to late pink stage. Pheromone traps can be used to determine first moth emergence.

Continue monitoring tarnished plant bug (adults can be found in ground cover and feeding on flower buds). Adult activity in trees may increase following mowing.

Continue monitoring weather conditions for apple scab infection periods and treat accordingly.

Check buds for damage if cold temperatures warrant it.

Delay fungicide treatments for apple scab in “low risk” orchards (as determined by monitoring the previous autumn) until three infection periods have occurred or the pink stage is reached, whichever comes first. This strategy can be effective with the use of sterol inhibitors, where resistance has not developed.

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3.0 Prebloom IPM Activities, continued

Adoption

Monitor the development of rosey apple aphid and mite populations.

Apply codling moth mating disruption products prior to bloom in Red Delicious.

Begin monitoring weather conditions for fire blight. Use predictive models (e.g., MARYBLYT) to help identify potential high risk or infection periods. Apply bactericides and/or plant growth regulators if needed.

Number of practices adopted (enter here and on IPM scorecard, page 7)

Total

4.0 Bloom IPM Activities — Bloom to Petal Fall

Continue weekly scouting of all pests – insects, diseases and weeds.

If using imported pollinators, place prior to king bloom.

Do not use any pesticides toxic to pollinators when pollinators and bloom are present (consult Extension Bulletin E-154, Fruit Spraying Calendar).

If blooming weeds are abundant on the orchard floor, mowing can be advantageous to fruit set.

Begin plum curculio monitoring.

Continue sampling for pest and beneficial mites. Schedule miticides only when over threshold and predators are insufficient to provide control.

Begin sampling for obliquebanded leafroller larvae in terminals.

Continue apple scab management. Spend some time monitoring for primary lesions – look high in the trees.

Monitor pollinator activity, weather conditions and fruit set. Begin to plan thinning strategies.

Survey for apple pests in areas adjacent to orchards with unmanaged host trees, such as apple, hawthorne and plum trees.

Number of practices adopted (enter here and on IPM scorecard, page 7)

Total

5.0 Early-summer IPM Activities — Petal Fall through June

Monitor terminal shoot growth for oriental fruit moth injury (flagging).

Carefully monitor fruit set to determine need and timing for chemical thinning.

Scout weekly for aphids and predators on growing terminals. Treat only when aphids are over thresholds and predators are insufficient to control aphids. Generally, an average of 3 to 4 infested leaves is needed before fruit damage from honeydew occurs; 1 to 2 leaf colonies may inhibit growth in younger trees.

Continue weekly inspection of codling moth traps. Calculate degree days from the first sustained codling moth capture in pheromone traps. Time pesticide applications for codling moth according to degree-day model. Replace trap lures and bottoms, as needed.

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5.0 Early-summer IPM Activities, continued

Adoption

Continue monitoring plum curculio activity. Inspect fruit in perimeter rows for fresh injury from plum curculio. Use perimeter row sprays for plum curculio in place of at least one whole-orchard spray where appropriate.

Monitor scale insects in orchard blocks with a history of infestation. Adults can be monitored with pheromone traps, crawlers by banding limbs with tape. Use spot treatments for scale where warranted.

Begin sampling for leafmines and treat second generation according to sampling results.

Calculate scab spore maturity to estimate end of primary season for apple scab.

Continue apple scab management until the end of primary scab; where primary infection occurred, continued monitoring and protection programs.

Continue to monitor for fireblight strikes and prune out as needed. Monitor for high winds, hail or other events that could damage foliage and cause fireblight infections.

Monitor leaf wetness hours to determine the need for summer fungal disease (fleyspeck and sooty blotch) control.

Apply obliquebanded leafroller mating disruption product prior to the start of the flight.

Begin monitoring leafhopper activity.

Begin monitoring dogwood borer activity with pheromone traps in orchards where burr knots are present.

Recalibrate spray equipment and adjust spray pattern for tree growth.

Number of practices adopted (enter here and on IPM scorecard, page 7)

Total

6.0 Midsummer IPM Activities — July

Adoption

Collect foliage and submit for nutrient testing in late-July to early-August according to instructions from the testing lab.

Begin apple maggot monitoring in late-June with baited visual traps. Timing of insecticide treatment is dependent on choice of insecticide. Use orchard perimeter row treatments for apple maggot where appropriate.

Continue monitoring accumulated hours of leaf wetness and manage summer diseases accordingly.

Continue monitoring codling moth, oriental fruit moth, leafroller and mites. Replace trap lures and bottoms as needed.

Number of practices adopted (enter here and on IPM scorecard, page 7)

Total

7.0 Late-summer IPM Activities — August and September

Adoption

Summer-prune densely foliated, vigorous trees for air circulation, fruit coloring and spray penetration.

Continue monitoring apple maggot, codling moth, oriental fruit moth and obliquebanded leafroller. Replace trap lures and bottoms as needed.

Continue orchard perimeter row treatments for apple maggot where appropriate.

Continue monitoring accumulated hours of leaf wetness and manage summer diseases accordingly.

Number of practices adopted (enter here and on IPM scorecard, page 7)

Total

8.0 Harvest IPM Activities — September to October

Conduct fruit damage samples prior to harvest to evaluate management program. Identify hot spots for pests with clumped population distributions for future pest control planning.

Monitor fruit maturity and harvest fruit at the correct time for the cultivar and intended use.

Maintain records of harvest date by cultivar and management unit.

Cool fruit immediately after harvest.

Limit post-harvest chemical treatments to cultivars intended for long-term storage and with moderate to high risk of storage rots. Estimate risk of storage rots based on block history, fruit analysis, orchard and weather factors.

Use cultural practices to control post-harvest disorders, including preventing soil splash onto fruit during the growing season, removal of sources of inoculum from the orchard and management of fruit mineral content.

Number of practices adopted (enter here and on IPM scorecard, page 7)

Total

9.0 Postharvest IPM Activities — October to November

Adoption

Properly clean and store application equipment and leftover chemicals. Recycle plastic pesticide containers. Dispose of unwanted/unusable pesticides at Clean Sweep site.

Assess orchard blocks for potential vole problems and apply rodenticides where problem existed the previous year. Place and/or maintain vole guards on tree trunks. Mow orchards close to minimize vole habitat and increase predation.

Note blocks with heavy scab infection. Estimate potential ascospore dose for the following season.

Mow fallen foliage to reduce apple scab inoculum and overwintering leafminer populations.

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9.0 Postharvest IPM Activities, continued

Adoption

Monitor and maintain storage facilities and equipment for optimum operating conditions. Monitor fruit in storage for internal and external condition. Adjust marketing plans according to results. Maintain records of results to improve future production, harvest and storage results.

Maintain records of pest monitoring and management.

Remove or shred apple drops.

Number of practices adopted (enter here and on IPM scorecard, below)	Total
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10.0 IPM Scorecard

Enter the number of IPM practices adopted for each growing season. Your goal is to increase the IPM practice adoption rate to produce quality fruit more efficiently, effectively and safely.

Growing Season	Number of practices described	Number of practices adopted
1. Preseason	12	
2. Late-dormant	8	
3. Prebloom	11	
4. Bloom	10	
5. Early-summer	15	
6. Midsummer	4	
7. Late-summer	4	
8. Harvest	6	
9. Postharvest	7	

11.0 Future IPM Adoption Goals

Enter IPM practices that can be adopted over the next two years.

Growing Season	Practice	Date to adopt	Results

This bulletin was co-authored by the National Farm*A*Syst office, Madison, Wisconsin, and adapted for Michigan by Dr. Charles Edson, Dr. Allen Krizek, Dr. Roberta Dow, David Epstein, Dr. Larry Gut, Amy Irish-Brown, Gary Thornton and Don Lehman, Michigan State University. Also contributing were private crop consultants Doug Murray and John Bakker.

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