Truearth Protocol and Self-Assessment

Locally grown goodness.™

2024 Growing Season – 04/01/2024

See page 41 for list of revisions to this edition.

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Download the most recent protocol at ipminstitute.org/Truearth.htm

Table of Contents

Contents

The Truearth Certified™ Protocol

This protocol was developed to recognize the accomplishments of apple producers in the Upper Mississippi River Valley of Minnesota and Wisconsin. Since 2010, with support from the United States Environmental Protection Agency and Department of Agriculture, we have worked to identify opportunities to achieve a measurable reduction in the use of highly toxic pesticides. By organizing these practices into the *Truearth Certified Protocol*, we hope to contribute to the supply of quality local foods and improve our soil and water resources, wildlife biodiversity, farmworker safety, farm stability and farmland preservation.

Our protocol is based on a reduced-risk program developed by researchers, consultants and growers, and generally follows guidelines for integrated production by the International Organization for Biological and Integrated Control of Noxious Animals and Plants (IOBC). This effort first began with the Red Tomato Eco Apple Protocol, redtomato.org/eco, and with their permission, we have used their protocol as a platform to identify best practices to address pest management and production challenges in our region.

Our goal is to improve continuously as we learn more about reduced-risk alternatives and what it takes to implement them *and* grow high quality apples.

Roles and Procedures

Wescott Agri Products is the lead organization responsible for market approach and overseeing use of Mississippi Valley Fruit Company trademarks. Annually, Wescott Agri Products and its partners will review and evaluate the Protocol and Self-Assessment and make adjustments where needed to continue to achieve our goals.

The IPM Institute of North America, an independent non-profit organization, is responsible for final decisions on standards and approval of certification status and use of the Truearth trademark. The IPM Institute contracts directly with growers to provide an on-site inspection which will be conducted by the IPM Institute or an independent third party. This inspection verifies compliance with the standard and has a special emphasis on evaluating compliance to criteria that are not measurable through documentation and records submitted to the IPM Institute for review prior to the inspection.

Participating Growers will be evaluated based on practices implemented. A current version of the *Truearth Protocol and Self-Assessment* and Quick Guide is always available at ipminstitute.org/Truearth.htm.

To apply for and maintain certification, follow these steps:

1. Complete this Self-Assessment and submit to the IPM Institute with:
   A. Scouting records, trap counts and weather data. Scouting records must include date, block(s), pest and result, e.g., captures per trap, mites per leaf, etc. The purpose of scouting records is to provide an understanding of what the grower is observing in the orchard along with historical information that is being used to inform pest and disease spray decisions.

   B. Pesticide, fertilizer, thinner and plant-growth regulator application records to the IPM Institute. Application records must be submitted electronically and include at least the date and time application started and ended, crop, block(s), acreage, trade name and formulation of material applied (with EPA registration number, active ingredient, target pest for pesticides and duration of Restricted-Entry Interval), rate per acre (oz.,

gal. or lb./acre), application method. Record keeping can be improved by using an electronic record-keeping spreadsheet, such as those offered by Penn State (Penn State Spray Record-Keeping Spreadsheet) or Cornell University (Trac Apple). Spray records must include all applications with an EPA registration number including mating disruption, herbicide applications and rodenticides.

The IPM Institute of North America maintains confidentiality of all grower records which include, but are not limited to: Self- Assessment, pest-monitoring records, weather data, and records of pesticide, fertilizer, thinner and plant-growth regulator applications.

2. The IPM Institute will appoint an inspector during the first year of certification and every third year thereafter. The inspector will verify the information provided during an on-site audit scheduled prior to marketing of certified fruit. Growers will be invoiced by the IPM Institute for the on-site audit. The audit fee is separate from and in addition to the annual fee paid for certification.

Provisions for Emergencies

Contact the IPM Institute at the earliest indication that an emergency is developing that cannot be managed without violating the certification standards. The IPM Institute will investigate the concern and if necessary, consult with scientific advisors to assess the problem and determine if an exception to the protocol is justified.

Participants may expect the following support from the IPM Institute and project advisors regarding handling requests in emergency situations:

1. Receipt of requests for protocol exceptions will be acknowledged by the IPM Institute within one business day.

2. A response to the request with proposed options and resolution will be completed within one to three business days. This time is needed to allow the IPM Institute to contact scientists and project advisors and investigate appropriate solutions.

Protocol Format

1. **Minimum Requirements and Reference Guide (Section I)** includes practices required for fruit to be eligible for Truearth Certification. The Reference Guide discusses additional compliance criteria and practice exemptions that may apply. The criteria in the Reference Guide must be met to meet certification standards and is subject to review for compliance during on-site and desk audits. page 7

2. **Scored-Advanced Practices (Section II)** allows producers to select a group of sustainable elements best suited to meet specific crop production and pest management challenges. page 13

3. **Pesticide Hazard Ranking and Use Restrictions (Section III)** identifies pesticide restrictions which exceed label requirements, prohibited pesticides and hazards associated with all pesticides. page 25

Self-assessment coversheet

Grower name: _____

Business name: _____

Physical address: _____

Phone: ( ) _____ Fax: ( ) _____

Cell phone: ( ) _____

Email address: _____

Website: _____

Orchard Block List. List orchard blocks covered by this Self-Assessment. Blocks not enrolled in Truearth Certified should not be included. Cultivars not eligible for certification located within an enrolled block should not be included. Attach additional pages if needed to list all blocks.

Block ID	Cultivars	Acres	Annual Production (Bushels)

I. Minimum Requirements

Grower must answer yes to all of the following for all blocks in the program, to be eligible for certification. Explain any No or NA answers. Attach additional pages as needed.
Superscripts indicates practice-verification process. Reference the following throughout page 6 - 23:
[D] Verified during desk audit via submitted paperwork [S] Verified during site audit

Enter: Y for yes, N for no or NA for not applicable in box left of each question.			**Reference guide**
A. Legal Requirements			
1	**Y/ N/ NA**	Does farm comply with all legal requirements for pesticide and nutrient applications? [S]	• Worker Protection Standard (WPS) requirements are followed, epa.gov/pesticide-worker-safety/agricultural- worker-protection-standard-wps. • Pesticide applications meet label requirements. • Distance from pesticide mixing and well head meets state legal requirements. • Food Safety Modernization Act (FSMA) requirements are followed. www.fda.gov/downloads/Food/GuidanceRegulation/FSMA/UCM472887.pdf.
2		Please select all of the following audits or inspections that occurred on your farm from third parties, the state or federal government: 1. Good Agricultural Practices (GAP) 2. Food Safety (non-GAP) 3. Worker Housing 4. Occupational Safety and Health Admin. (OSHA) 5. Worker Protection Standard (WPS) 6. Other(s) _____	• This information will help prioritize the on-farm audit.
3		Application records include at least the **date** and **time application started and ended**, **crop**, **block(s)**, **acreage**, **product name** and formulation of material applied (with **EPA registration number**, **active ingredient**, target pest for pesticides and **duration of Restricted-Entry Interval**), rate per acre, and application method. [D]	• Items highlighted in bold are required by the US EPA Worker Protection Standards for Agriculture. For more information visit: http://pesticideresources.org/wps/hosted/quickrefguide.pdf.

B. Soil and Water Conservation			
4		Are visibly eroded areas minimal, and when found, are they corrected? [S] Please select all erosion mitigation strategies that are implemented: A. Culvert(s) B. Water diversion C. Retention pond(s) D. Other(s) (Please list):	• Applicable to all enrolled acres, including adjoining roads and farmstead.
5		Do vegetated buffers separate surface water from managed apple trees by at least 60 ft.? [S]	
6		Are nutrients applied based on results from soil and/or foliar analyses and are these records for the last 12 months available for inspection? [S]	• Test soil at least once every three years. Soil-test results include: soil-organic matter, pH, nitrogen, phosphorus, potassium, calcium and magnesium. • Does not apply to foliar applications of calcium chloride or calcium nitrate used to manage bitter pit.
7		Are ground applications of nitrogen applied only between bud break and July 1st? [D] Note: Applications must be documented in spray records.	• If total nitrogen exceeds 50 lb. per acre, application must be split by at least one week. • Does not apply to post-harvest urea applications to leaf litter for apple scab management.
C. Pesticide Use and Hazard Reduction			
8		Are trees pruned to allow penetration of light, air and spray material? [S]	
9		To suppress insect pest and disease inoculum, pruning debris remaining in the field is (Please select all that apply) [S]: A. Flail chopped B. Mowed C. Removed	

10		Are pesticide and nutrient application equipment calibrated according to the manufacturer's instructions, at least annually? Are records maintained and include name of person completing calibration, date of calibration, equipment description and procedure, results and adjustments from calibration? Calibration records must be submitted electronically with completed protocol. [D] Note if using a Raven or other GPS technology.	• Procedures, results, adjustments made and name of individual who performed the most recent calibration are available for inspection. • Airblast sprayer calibration verifies gallon per acre (GPA) application rates by documenting travel-ground speed, gallon-per-minute flow rates of nozzles, sprayer pressure and tree-row widths. • Spray control systems including GPS and flow meters are calibrated during initial installation and inspected annually for maintenance needs and recalibrated when necessary, e.g., after parts replacement. • Growers contracting with custom applicators should request verification that equipment is calibrated. • Calibration for airblast sprayer: extension.psu.edu/sprayer-calibration-information sprayers101.com/airblast-output sprayers101.com/how-to-calibrate-an-airblast-sprayer-operator • Calibration for boom sprayer: extension.colostate.edu/docs/pubs/farmmgt/05003.pdf • Calibration for rotary spreader: pesticidestewardship.org/calibration/Pages/RotarySpreader.aspx • Calibration for a drop spreader: pesticidestewardship.org/homeowner/how-to-calibrate-a-drop-spreader • Note: Tree-row volume is helpful in determining the appropriate GPA of water based on tree size, canopy density and row width.
11		Are average wind speed and direction used at time of application to reduce potential for drift? Weather resource used (Please select all that apply): [S] A. Hand-held monitor B. Weather station C. Online resources with real time wind-speed data	• Label requirements referencing maximum wind speeds are followed. • Weather data may be obtained from hand-held devices or weather services via the internet.

12		Are pesticides with an EPA pollinator toxicity advisory box on the label not applied between tight cluster and the end of crop bloom? [D]	• New EPA pollinator advisory box, pesticidestewardship.org/wp-content/uploads/sites/4/2016/07/bee-label-info-graphic.pdf. • Information on selecting pesticides least toxic to pollinators is available through Oregon State Extension, https://catalog.extension.oregonstate.edu/pnw591.
13		Are pesticides no longer used or no longer registered for use returned to dealer or disposed of at the next collection? [S]	• While in storage, obsolete pesticides are clearly marked 'DO NOT USE' and separated from pesticides in current use.
D. Pest Monitoring and Management			
14		Can an orchard staff member or crop advisor identify the following? [S] • Major and emerging insect pests, diseases and weeds on the farm? • Life cycle of major and emerging insect pests, diseases and weeds, as it relates to pest management. • Beneficial insects, such as natural predators of crop insect pests?	• At least one individual employed by or under contract with the farm can visually identify the major and emerging insect pests, diseases and weeds present, describe these pest life cycles and visually identify the major beneficial insects present, e.g., lady beetles, lacewings, syrphid flies, predatory mites, minute pirate bugs, black hunter thrips.
15		Are pests and diseases scouted, sampled and monitored at least once every two weeks and/or prior to the application of pesticides? [D]	• Blocks are scouted to gather a representative sample of pest infestations, and to accurately determine if populations exceed action thresholds.
16		Are scouting observations, degree days, weather data and trap counts documented in a handwritten or electronic format? [D]	• Documentation of scouting includes specific qualitative and quantitative observations, e.g., number of mites per leaf, biofix dates, specific location of pest infestation, date and block where pests are observed, etc.

17		Are pesticide application decisions and timing based on data from the farm and techniques such as action thresholds, degree-day models and decision-support/ predictive systems? [D]	• Where available and recommended by Extension or other regional experts, action thresholds are used to determine whether or not and when to take action against pests, e.g., codling moth, apple maggot, plum curculio and apple scab. • Where recommended, models are used to estimate when pests or diseases will require treatment, e.g., accumulation of degree days from a codling moth biofix, apple scab infections, or exceeding threshold on traps, e.g., five apple maggots caught on a baited sphere.
E. Orchard Floor and Weed Management			
18		Row middles or aisles (drive rows) are? (Please select all that apply) [S]: A. Sod B. Mulch covered C. Cover cropped year-round	
19		Are herbicide strips contained within the canopy drip zone? [S]	
20		Does mode of action rotate between each application of an herbicide? [D]	• Back-to-back applications of the same mode of action are permitted where consistent with the product label, Extension recommendations or if tank-mixed with another herbicide with a different mode of action. • Applies during and between seasons.
21		Are herbicide applications limited to three per season on the same application site? [D]	• If adequate control is not achieved, a fourth herbicide application may be applied. Application must be supported with documentation identifying weed species that were not controlled during previous applications.

F. Food Safety and Product Quality			
22		Is fruit harvested according to guidelines from the packing house? S	• Firmness, brix, starch-iodine testing or other accepted measures, may be used.
23		Are clean toilets and hand-washing facilities available to field, harvest and packing house staff? S	
24		Are manure applications limited to areas outside of bearing orchards? S	• Practice 22: soap must be available at hand-washing facilities. Hand sanitizer may also be present but is not an adequate substitute. • Practices 22 - 27 have been met if farm has a valid certification for USDA GAP or a Global Food Safety Initiative recognized food safety scheme, e.g., GLOBALG.A.P., PrimusGFS. For more information visit: https://mygfsi.com/how-to-implement/recognition/
25		Are travel ways between trees and packing and storage facilities inspected for ruts, erosion, bumps or rocks and repaired prior to harvest? S	
26		Are fruit bins and boxes sound and cleaned of soil, plant or animal debris prior to use? S	
27		Are filled harvest containers transported immediately to packing and storage facilities? S	
28		Are packing and storage facilities free from pest and rodent infestations and secured to prevent the intrusion of wildlife and pets, which may contaminate harvested crops? S	
G. Energy and Waste Management			
29		Are pesticide containers (including paper), plastics, rubber or industrial products may not be disposed of properly and not by burning? S	
30		Are lead-acid batteries, used oil, industrial chemicals and other hazardous materials disposed of by taking to an approved recycling drop-off location? S	• Approved locations include auto-service centers, municipal or private recycling or hazardous waste-collection facilities.
31		Are buildings that are heated and cooled insulated? S	

H. Pollinator Conservation			
32		Are orchard borders assessed for pollinator habitats (nesting and forage sites), and if present are these habitats protected from drift using one or more of the following mitigation strategies? [S, D] Please select all that apply: a. Pesticides toxic to pollinators are not applied when native pollinators are actively foraging. b. Windspeed and wind direction is monitored and used to prevent pesticide drift to pollinator habitats. c. Maps outline location of pollinator habitats are used to educate applicators on sites where drift must be avoided. d. Other, please list: Note: • EPA pollinator toxicity advisory box on labels: pesticidestewardship.org/wp-content/uploads/sites/4/2016/07/bee-label-info-graphic.pdf • For information on how to reduce bee poisoning, Extension,https://www.oregon.gov/ODA/shared/Documents/Publications/PesticidesPA RC/PollinatorProtection.pdf • Best management practices to protect pollinators, https://www.epa.gov/pollinator- protection/find-best-management-practices-protect-pollinators.	
33		Are pesticides with an EPA pollinator toxicity advisory box on the label not applied between pink and end of crop bloom? (See link on pollinator advisory above) [D]	

Superscripts indicates practice-verification process. Reference the following throughout page 6 - 24:
[D] Verified during desk audit via submitted paperwork
[S] Verified during site audit

II. Scored Advanced Practices

Enter points earned for each advanced practice that is implemented on the farm. Note: To be eligible for points, advanced practices must be implemented on all enrolled acres that benefit from the practice. **See page 25** for total number of points required to earn certification.
Superscripts indicates practice-verification process. Reference the following throughout page 6 - 24:
[D] Verified during desk audit via submitted paperwork
[S] Verified during site audit

A. Soil and Water Conservation			
	Points eligible	***Points earned***	
34	***1***		Is no irrigation used? Note: If earning this point skip to practice 33 below. Do not enter points for practice 31 - 32. [S]
35	***1***		Is drip or trickle irrigation installed to ensure adequate water supply and minimize water use and foliage wetness? [S]
36	***1***		Where irrigation is installed, is a rain-activated shutoff device, evapotranspiration or soil moisture monitoring used to schedule irrigation timing/ amounts? [S] Note: The Cornell Apple Irrigation Model can be used to determine water demands and plan your irrigation schedule, newa.cornell.edu/index.php?page=apple-irrigation.
37	***1***		Are tree rows planted on contours where slopes have a history of or high potential for erosion? [S]
38	***1***		Are water bars installed on roads with slopes with a history of or high potential for erosion? [S] Note: Grower can describe how often water bars are maintained and where they are located.
39	***2***		Is tile drainage installed and maintained in poorly drained soils or are trees not planted in poorly drained soils, to improve tree health and minimize disease? [S]
40	***1***		Are windbreaks installed and maintained on sites with a history of or high potential for wind-eroded soil? [S]
41	***3***		Are any acres of the farm currently enrolled in an NRCS program which supports IPM or other conservation practices? [S] List program name, acres enrolled and type of land. Note: Additional information on NRCS programs and initiatives available online from NRCS.

42	***1***		Compost is used to supplement or replace commercial fertilizer in non-bearing and/or bearing orchards. [S]
43	***2***		During orchard renovation, keylines are installed to improve infiltration, aeration, retain water and breakup compaction, while minimizing disturbances to the blocks soil structure. [S]
44	***3***		Practices are implemented to improve soil health based on results identified in advanced soil health indicators and then soil health indicator is retested after three years. [S,D] In one sentence please identify the practice and blocks practice is implemented on: During an on-farm audit, the grower should be able to: • Describe the soil-health concern and identify which indicator was used to measure soil health. • Describe the practice that was implemented, maintenance needs and frequency of maintenance. • Clearly identify location of blocks covered in the practice (Maps are not required but helpful). • Results of initial assessment of soil health indicator and results after third year of practice implementation are available for review during on-farm audit. • Notes, photos, receipts of purchases, etc. showing implementation of practice are available for review during on-farm audit.
	17		**Total Points: Soil and Water Conservation**
B. Pesticide Use and Hazard Reduction			
45	***2***		Are tractor cabs plus required personal protective equipment used to protect pesticide applicators? [S]
46	***1***		Is a spray-control system, e.g., Raven Applied Technology, used to regulate gallon-per-acre application rates of pesticides? [S]
47	***1***		Is airblast spray pattern evaluated and adjusted by assessing droplet size and coverage using water-sensitive cards? sprayers101.com/confirm-coverage-with-water-sensitive-paper. [S] Note: Results are available for review, including changes made to the sprayer or canopy management, as a result of the test.
48	***1***		Are 'WARNING' labeled pesticides not used? [D]
49	***1***		Are 'DANGER' labeled pesticides not used? [D]

50	***2***		Are herbicides with high risks to water quality avoided? [D] Note: Applying these high-risk products will not receive credit for this practice: Gramoxone (paraquat-dichloride), Prowl H20 (pendimethalin), Starane Ultra (fluroxypyr-methyl) and Venue (pyraflufen-ethyl). The Pesticide Risk Tool and Windows Pesticide Screening Tool (WIN-PST) were used to identify high risks relating to water quality and aquatic life. Note: See list of herbicides which pose high-risk to water quality on page 16 of the Spray Guide.
51	***1***		Are at least 50% of trees on M.7 or smaller size-controlling rootstocks? [S]
52	***2***		Is fruit thinning completed without carbaryl? [D]
53	***2***		Are multiple oil applications made pre-bloom to suppress mites and scale? [D]
54	***0.5 - 2***		Biopesticides are used, e.g., *Bacillus subtilis*, *Bacillus thuringiensis*, granulosis virus. [D] Note: 0.5 points may be scored for each application, for a maximum of two points. Note: Streptomycin is not considered a biopesticide for this practice.
55	***1 or 2***		Have two or more full-block insecticide applications been replaced by alternate-row-middle (ARM) applications? [D] Note: Use practice for insecticide applications only, not appropriate for fungicide applications. Additional ARM sprays target opposite row from previous treatments. ARM sprays count as half of one application. Pesticide records must document which rows were treated. For additional information visit, sprayers101.com/alternate-row-middle-spraying. Note: Indicate on spray record when an ARM application is made. Note: One point per application may be scored for a maximum of two points.
56	***1 or 2***		Have two or more full-block insecticide applications been replaced by applications to perimeter rows? [D] Note: Use practice for insecticide applications only, not appropriate for fungicide applications. Perimeter sprays include both sides of a tree row up to the first four rows or up to 50 feet from the orchard edge. Note: Spray records clearly identify which perimeter of a block was treated. Note: One point per application may be scored for a maximum of two points.

B. Pesticide Use and Hazard Reduction (continued)			
57	***1 or 2***		Have two or more full-block insecticide applications been replaced by partial-block applications? [D] Note: Use practice for insecticide applications only, not appropriate for fungicide applications. Applications must meet label restrictions on number of applications to those trees and total amount of active ingredient applied. Pesticide records must document sections of block treated. Note: Partial blocks may be documented by listing acres treated compared to total acres of block, e.g., 6/10 acres treated or listing varieties treated. Note: One point per application may be scored for a maximum of two points.
58	***1***		Are grain-based rodenticides (corn, oats) only applied in bait stations or burrows? [D] Note: Rodenticide applications are included on spray records and include date and blocks treated. Including a rate per acre is not necessary.
59	***1***		Are rodents managed without rodenticides? (Please select all that apply) [D] A. Close mowing B. Mouse guards C. Painting trunks with white latex paint D. removing drops E. Encouraging predators Note: Practice receives the same number of points regardless of how many options are selected.
60	***2***		Are the trunks of susceptible cultivars painted with white latex paint or wrapped with white tree guards to reduce winter injury? [S]
61	***1***		Is the lowest recommended rate of captan applied during the summer for sooty blotch and fly speck management? [D]
62	***2***		Is a urea treatment applied to reduce apple scab and/or marssonina leaf blotch pressure between post-harvest and silver tip? [D]
63	***1***		Are fallen fruit removed from beneath trees in blocks where bitter rot is an annual problem, after June drop and hand thinning, or in the fall after harvest? [S]
64	***1***		Are fire blight and black rot cankers and dead wood removed from trees during winter pruning and destroyed to promote rapid decomposition which reduces sources of overwintering inoculum? [S]

65	***2***		Is codling moth managed using mating disruption on 25% of all producing acres? [D] Note: Document application in spray records.
66	***2***		Where dogwood borer requires intervention, is pheromone mating disruption used? [D] Note: Document application in spray records.
	34		**Total Points: Pesticide Use and Hazard Reduction**
C. Pest Monitoring and Management			
67	***1***		If weeds are targeted with herbicides, are they scouted at least once per season and documented to indicate species and location, e.g., block, tree row or row middle? [D] Note: Document weed observations in scouting records.
68	***1***		Are mite thresholds adjusted upwards based on varietal susceptibility, current or anticipated weather, or other factors reducing potential for economic injury? [S] Note: Document mite counts, dates and varieties in scouting records. https://cpb-us-w2.wpmucdn.com/u.osu.edu/dist/1/8311/files/2014/12/AppleScoutMite-292fumw.pdf
69	***1***		Is air temperature, average wind speed and direction during application documented in spray records? [D]
70	***3***		Is the Cornell Apple Carbohydrate Thinning Model (newa.cornell.edu/index.php?page=apple-thin) used for thinning and crop load management? [S]
71	***3***		Is the Predicting Fruitset Model (https://www.canr.msu.edu/news/updated-apple-cropload-management-models-are-available or https://malusim.org/) used for thinning and crop load management? [S]
72	***1***		Is a regional Network for Environment and Weather Applications (NEWA) station used for pest and disease management, newa.cornell.edu? [D] List NEWA location:
73	***1***		Are Maryblyt or CougarBlight used before making any antibiotic applications for fire blight? [D]
74	***1***		Do spray records include pesticide cost per acre for all applications? [D]
	12		**Total Points: Pest Monitoring and Management**

D. Orchard Floor, Soil Health and Alternate-Host Management			
75	***1 - 2***		Are non-chemical method(s) used to manage weeds and reduce dependence on herbicides on one to ten acres of orchard? An additional point may be scored where practice is implemented on more than ten acres [S] (Please select all that apply): Practices applicable to tree row (1 point): A. Mulching B. Cultivation C. Close mowing/String trimming Practices applicable to drive row (1 point): D. Aeration E. Over-seeding F. Mow and blow Note: Practice receives the same number of points regardless of how many options are selected.
76	***1***		Is the orchard groundcover managed to eliminate alternate hosts for tarnished plant bug, e.g., winter-annual weeds, chickweeds, dandelion, clovers, vetch and other legumes? [S]
77	***2***		Are wild apple trees removed from adjoining fields, borders and woods? [S]
78	***2***		Are brambles, wild hosts of sooty blotch and flyspeck, removed from adjoining fields, borders and woods? [S]
79	***1***		Are bases of trunks kept weed-free to reduce burr knot growth and environments attractive to borer species? [S]
80	***1***		Are slow-growing species of ground cover planted to reduce mowing requirements? [S] Note: Grower must be able to show or describe ground cover species planted and block location.
81	**3-4.5**		A mulching program is in place and mulch is renewed as needed to build soil heath and suppress weeds.[S] Points for mulching systems: • One to ten acres: 3 points. • Each additional block of five acres, 0.5 points may be scored and up to a maximum of 1.5 additional points, which equals an additional 15 acres. • Practice longevity is estimated at three years per application of mulch.

82	***2***		3. During orchard renovation are practices used to improve infiltration, aeration, retain water and breakup compaction? [s] Select all that apply: a. Tillage radishes are used to break up compaction and improve infiltration. b. Cover crops used to improve organic matter and water retention. c. Sub-soil ripping without cultivation in drive rows to aerate and improve water infiltration. d. Other: Note: Consult with local Extension or USDA-NRCS guidelines to determine appropriate cover crops for soil types and climate conditions.
	15.5		**Total Points: Orchard Floor, Weed and Alternate-Host Management**
E. Pollinator Conservation			
83	***1***		Non-blooming buffer of ≥ 60 feet are maintained around all field borders where pesticides toxic to pollinators are applied. [S] Note: Buffers prone to collecting pesticide drift are mowed to eliminate bloom in ground cover prior to pesticide application toxic to pollinators. The Xerces Society recommends a minimum buffer of 125 feet from crops treated with neonicotinoids and 60 feet from all pesticides applied with an airblast sprayer, to protect pollinators, https://xerces.org/publications/fact-sheets/guidance-to-protect-habitat-from-pesticide-contamination
84	***2***		If managed beehives reside on the farm year-round, they are monitored for health, their diseases are controlled and documentation of monitoring is available for review, e.g., date and description of monitoring activities. [S] Note: Regular, seasonal inspection and treatment of hives for Varroa mites and disease with accompanied documentation.

E. Pollinator Conservation (Continued)			
85	***2-4***		Is established pollinator forage habitat which provides season-long bloom available for managed and wild pollinators? S,D Converted acreage to native pollinator habitats: — One to five acres designated pollinator habitat: two points. — Each additional designated habitat totaling block of five acres: one point. — Maximum of four points may be scored for a total of 15 acres designated to pollinator habitat. Note: Pollinator habitat includes a seed mix which provides season-long bloom for native pollinators and is approved by Xerces society, or a state or federal conservation agency, e.g., Department of Natural Resources, USDA-NRCS, etc. Establishing a diverse pollinator habitat on designated land around installed solar panels could be included in acreage counted.
86	***1***		Is pollination accomplished without commercially produced bumblebee hives? S
87	***2***		Pollination is accomplished exclusively with native bees. S
88	***1***		Blooming ground cover in the drive row is reduced to protect pollinators from drift using non-chemical strategies. S,D Note: Practice recognizes mowing or herbicide applications which target broadleaf weeds in drive rows and row middles or noxious weeds anywhere in the field, mda.state.mn.us/plants/pestmanagement/weedcontrol/noxiouslist.aspx Note: Grower should be able to describe the location and how often or what conditions would trigger mowing, e.g., is it timed before or after sprays, etc.
89	***2***		Are insecticides which pose high risks to pollinators from drift or foraging pollinators within the orchard avoided? D Note: Applying these high-risk products will not receive credit for this practice: Actara (thiamethoxam), Alias/Montana/Wrangler (imidacloprid), Belay (clothianidin), Entrust (spinosad) and Lorsban (chlorpyrifos). None of these products are applied to receive credit for this practice. The Pesticide Risk Tool was used to identify high risks to pollinators. Note: See list of insecticides which pose high-risk to pollinators from drift on page 16 of the Spray Guide.

E. Pollinator Conservation (Continued)			
90	***1***		Are nesting habitat for wild pollinators is created and managed throughout the growing season? [S] Note: Wild bee housing placed in and around forage and pollination target areas. Housing can include not removing dead trees (when it's safe to do so), presence of hollowed out reeds/stems of bushes or erecting bee housing. Note: Establishing a diverse pollinator habitat on designated land around installed solar panels could be included in acreage counted.
91	***1***		Is pollinator activity monitored during bloom through participation in WiBee: the Wisconsin Wild Bee App? D https://pollinators.wisc.edu/wibee/ Note: This application was developed by the Gratton Lab at UW-Wisconsin- Madison. This application provides the farmer with a tool to document and create a baseline understanding of pollinators present in their orchard. This baseline is a tool to measure whether the practices being implemented are generating the results and improvements the orchard is looking for.
92	***1***		Ongoing education: Grower has attended a training on pollinator conservation (ie., pollinator habitat, importance of native pollinators, etc.)[D]
	16		**Total Points: Pollinator conservation**
F. Grower Education and Self-Improvement			
93	***1***		Has a field day or other production-related educational meeting been hosted on the farm within the last three years? List date and name/description of event: [D]
94	***3***		Has on-farm research been conducted using control (untreated) trees for comparison within the last three years? List subject of research and dates: [D]
95	***2***		Do you belong to a state and/or regional grower organization, in addition to participation in Truearth Certified? List organizations: [D]
96	***2***		Have you attended one or more ongoing education or training event in addition to the Truearth Certified Annual Meeting within the last year? List meetings or training event: [D]
	8		**Total Points: Grower Education and Self-Improvement**

G. Energy and Waste Conservation			
97	***1***		Is energy efficient lighting used in the office, packing and storage facilities? S
98	***1***		Is storage energy conserved through energy efficiency improvements to buildings, cooling pumps and compressors in cold storage? Please describe, attach additional sheets if necessary. Note: Points may be awarded for the life of the improvement. S
99	***2***		Are tractors and other motorized equipment used efficiently and effectively to reduce overall fuel consumption. e.g., do not let diesel engines idle longer than 5-10 minutes; tractors are operated in economy mode when appropriate e.g., spraying, mowing; tractors are maintained to maximize efficiency? S
100	***3***		A pesticide mixing and loading facility is used to catch and retain pesticide rinsate. S
101	**2**		Solar or wind energy are used to contribute towards on-farm energy needs. S
Practice 93 to 100 apply to the field, packing, storage, office and maintenance facilities on the farm. Take credit if at least 90% of the resource is recycled.			
102	***.25***		Are paper and cardboard recycled? S
103	***.25***		Is plastic recycled? S
104	***.25***		Is aluminum recycled? S
105	***.25***		Is glass recycled? S
106	***.25***		Are used pesticide containers, where consistent with regulations, recycled? S
107	***.25***		Are batteries recycled? S
	10.5		**Total Points: Energy and Waste Conservation**

H. Food Safety and Product Quality			
108	***2***		Are harvesting bins and storage rooms sanitized annually after storage and packing are completed? [S]
109	***4***		Does the farm have a valid USDA GAP, Global Food Safety Initiative GLOBALG.A.P. or PrimusGFS certification? [S]
110	***2***		Are orchard blocks fenced in to prevent wildlife and livestock from browsing/grazing in orchards? [S]
111	***2***		Is irrigation water tested in accordance with the FDA Food Safety Modernization Act agriculture water requirement? [S] Note: This practice is not required or enforceable by the FDA at this time. The first water test was proposed to take effect sometime in 2022 for small farms. Agricultural Water Proposed Rule: https://www.fda.gov/media/154334/download
	10		**Total Points: Food Safety and Product Quality**

Superscripts indicates practice-verification process. Reference the following throughout page 6 - 24:
[D] Verified during desk audit via submitted paperwork
[S] Verified during site audit

Score card	*Points eligible*	*Points earned*
Growers in the program more than one season must earn a total of at least 28 points for each block. First year growers must earn at least 20 points for each block.		
Total Points: A. Soil and Water Conservation	**17**	
Total Points: B. Pesticide Use and Hazard Reduction	***34***	
Total Points: C. Pest Monitoring and Management	***12***	
Total Points: D. Orchard Floor, Weed and Alternate-Host Management	**15.5**	
Total Points: E. Pollinator Conservation	**16**	
Total Points: F. Grower Education and Self-Improvement	***8***	
Total Points: G. Energy and Waste Conservation	***10.5***	
Total Points: H. Food Safety and Product Quality	***10***	
Total Score (add columns, include total for all sections)	**123**	

III. Pesticide Hazard and Risk Ranking

The following practices and products are listed for Midwest fruit production. Pesticide active ingredients have been evaluated for necessity to produce quality apples in the Midwest in commercial quantities, and for hazards to humans, natural enemies and other non-targets, potential to contaminate groundwater and resistance management. This is not an exhaustive list of practices or products.

Only fungicides, herbicides and insecticides which have been evaluated against our criteria and appear on the list of approved pesticides may be applied on enrolled blocks. If a fungicide, herbicide or insecticide is not included, please contact the IPM Institute to request a product evaluation. The IPM Institute will confirm receipt of requests within one business day and respond with a resolution within one to three business days.

> **Note:** Pesticides have been evaluated using formulated-active ingredients and differences in product formulation do impact acute risk. If pesticides with other trade names are used, they should have similar signal word (caution, warning), percent active ingredient and product formulation, e.g., wettable powder (WP), water-dispersible granule (WDG) or suspension concentrate (SC). **If a similarly formulated product is not available, please contact the IPM Institute to make an exemption request prior to application.**

Pesticide hazards were analyzed using the database at pesticideinfo.org, which collates information from recognized authorities such as US EPA and individual State Lead Agencies (SLAs) for pesticide regulation. SLAs are housed in state departments of agriculture or state environmental management agency, depending on the state.

The Pesticide Risk Tool (pesticiderisk.org) and Windows Pesticide Screening Tool, WIN-PST (go.usa.gov/Kok), have also been used to evaluate pesticide risks.

The following criteria were used to evaluate pesticides:

Acute toxicity to wildlife, fish, aquatic invertebrates: Product label, Pesticide Risk Tool
Acute toxicity: CAUTION, WARNING or DANGER Label/US EPA, Pesticide Risk Tool
Neurotoxin: Cholinesterase inhibitor or listed on Toxics Reduction Inventory maintained by US EPA
Possible, likely, probable carcinogen: US EPA, State of California, and International Agency for Research on Cancer
Reproductive/developmental toxin: US EPA, State of California, Pesticide Risk Tool
Toxic to pollinators, key natural enemies/secondary pests: Product label, Extension recommendations, variety of published sources
Toxic to wildlife: Product label, Pesticide Risk Tool
Suspected endocrine disruptor: Illinois EPA, Keith, Colburn or Benbrook lists.
Broad spectrum pesticide: Extension recommendations
Resistance risk: Extension recommendations
Potential or known groundwater contaminant: State of California, variety of published sources.

The following process was used to determine use and use restrictions:

a. Pesticide options currently in use by growers, or suggested by growers or others, are reviewed for status re the criteria listed above.

b. There are thousands of pesticides labeled for use on specialty crops in the United States. We only review those products currently in use or with strong potential for use, as suggested by participating growers and others.

c. Pesticides that are useful for our pest issues that do not have hazards as per our criteria, or pesticides with relatively readily mitigated hazards, are placed in "Low-Risk Pesticides, No Restrictions" or "Moderate to High-Risk Pesticides, No Restrictions" category. For example, for most products, acute toxicity to applicators is readily addressed by following label requirements for personal protective equipment. **No pesticides may be used without justification, e.g., sampling and thresholds, or weather monitoring, or block history of a problem where sampling or monitoring methods and thresholds are not available.**

d. Pesticides with hazards that are less readily mitigated are placed in the "Do Not Use" category. These are then reviewed for necessity in order to produce commercial quality fruit economically. Our goal is to limit the use of products with hazards to those we cannot do without.

e. Products which are needed to address a key pest are then moved to the "Use with Restrictions (Moderate to High-Risk Pesticides)" category. Measures that we can take to mitigate hazards are included, e.g., limiting the number of applications, or limiting use to one pest issue where the product is critical for adequate control.

f. Other products with similar hazards are not moved to the "Use with Restrictions (Moderate to High-Risk Pesticides)" category because the hazard profile is similar to those already in that category, but only if their use is a critical need that we identify as a group.

g. This is a subjective process. Definitive data are not available on many of the considerations here, e.g., thresholds are lacking for many pests, efficacy is variable, and development of resistance is a concern if available modes of action are limited. We don't know for sure exactly where to draw the line. We try to reach consensus on issues but realize this will not be possible in all cases. The protocol belongs to the IPM Institute of North America, Inc. and the Truearth Program is owned by Wescott Agri Products. The IPM Institute makes final decisions on protocol content.

h. A timeline for new products that do not have approved labels by the annual meeting will be provided, e.g., mid-season product releases. These products will be listed under their appropriate use category as per the review process and will include anticipated release date. **Products may not be used until a label has been approved for the state in which they will be used**. Applications made prior to the label approval date will be considered a protocol violation and result in disqualification of the blocks which received treatment.

Pesticide Use Restrictions		
IMPORTANT: All of the following products may not be registered in every state. Please confirm the product is labeled for use in your state!		
LOW-RISK PESTICIDES, NO RESTRICTIONS BEYOND THOSE ON THE PRODUCT LABEL 1. These pesticides may be used to the full extent of the pesticide label and pose minimal risk to environmental and human health. 2. Use only after predictive models or results from scouting and monitoring indicate treatment need based on thresholds, or block history. 3. Pesticides included are not a guarantee of efficacy. Some products will not be as effective as other products against specific target pests.		
Trade Name	**Active Ingredient**	**Best Practice**
Insect/Mite Management		
Cyd-X, Virosoft, Madex HP	*Cydia pomonella* granulovirus	
Mating disruption	1-dodecanol, 1-tetradecanol	Available for codling moth, oriental fruit moth and dogwood borer.
Nealta	cyflumetofen	
PFR-97	*Isaria fumosorosea*	
Spear-LEP	GS-omega/kappa-Hxtx-Hv1a	Improved efficacy when tank mixed with *Bt* products.
Surround	kaolin	Apply prior to trap catches based on historical data or insect model.
Venerate	*Burkholderia* spp.	
Disease Management		
Actigard 50WG	acibenzolar-s-methyl	Apply prior to fire blight infections
Blossom Protect	*Aureobasidium pullulans*	Apply during full bloom for fire blight
Double Nickel	*Bacillus amyloliquefaciens*	
Howler	*Pseudomonas Chlororaphis*	Apply in rotation with *Streptomycin* for fire blight.
Lifegard WG	*Bacillus mycoides*	Apply prior to fire blight infections (OMRI approved)
Regalia	*Reynoutria sachalinensis*	
Serenade	*Bacillus subtilis*	
Urea	urea	
Weed Management		
Avenger AG	d-limonene	
Other		
Apogee	prohexadione calcium	
Blush	prohydrojasmon	
Exilis, MaxCel, Promalin	benzyladenine	
Fruitone	1-naphthaleneacetic acid	
Plantskydd	blood meal	
Retain	aminoethoxyvinylglycine hydrochloride	
SmartFresh, Harvista	1-methylcyclopropene	

MODERATE to HIGH-RISK PESTICIDES, NO RESTRICTIONS BEYOND THOSE ON THE PRODUCT LABEL

1. These pesticides may be used to the full extent of the pesticide label. Moderate to high risks to environmental and human health are present.
2. Use only after systematic scouting or weather monitoring and science-based thresholds, or according to previous history where thresholds are not available.
3. Pesticides included are not a guarantee of efficacy. Some products will not be as effective as other products against specific target pests.

Trade Name	Active Ingredient	Concerns	Best Practice
Insect/Mite Management			
Acramite 50 WS	bifenazate	toxic to bees	
Avaunt	indoxacarb	toxic to mammals, birds, fish, aquatic invertebrates, highly toxic to bees	
Aza-Direct, Neemix	azadirachtin	toxic to bees, suspected endocrine disruptor, toxic to fish and aquatic invertebrates	
Agree, Deliver, Dipel	*Bacillus thuringiensis*	runoff risk to surface water	
Beleaf 50	flonicamid	potential groundwater contaminant	
Centaur WDG	buprofezin	potential groundwater contaminant	
Closer SC	sulfoxaflor	highly toxic to bees and earthworms	IRAC 4C neonicotinoid.
Damoil	mineral oil	toxic to fish	Performance is best when relative humidity is less than 65% and temperatures are warmer than 60°F.
Entrust	spinosad	toxic to bees	
Envidor 2 SC	spirodiclofen	toxic to fish and aquatic invertebrates, toxic to bees	
Esteem 35 WP	pyriproxyfen	toxic to fish and aquatic invertebrates	
Portal	fenpyroximate	highly toxic to fish and aquatic invertebrates	
Grandevo	*Chromobacterium subtsugae*	toxic to aquatic invertebrates	
Intrepid 2F	methoxyfenozide	hazardous to aquatic invertebrates, potential groundwater contaminant	
Kanemite 15 SC	acequinocyl	toxic to aquatic invertebrates	
Movento	spirotetramat	toxic to aquatic invertebrates and oysters, potential groundwater contaminant, potentially toxic to honeybee larvae	
PyGanic EC	pyrethrins	toxic to aquatic invertebrates and beneficials, highly toxic to bees	
Sivanto Prime	flupyradifurone	toxic to aquatic invertebrates, potential groundwater contaminant	IRAC 4D neonicotinoid.
Zeal WP	etoxazole	toxic to aquatic invertebrates	

MODERATE to HIGH-RISKPESTICIDES, NO RESTRICTIONS BEYOND THOSE ON THE PRODUCT LABEL			
Trade Name	**Active Ingredient**	**Concerns**	**Best Practice**
Disease Management			
Captan	captan	acute toxicity to workers, toxic to fish, carcinogen under prolonged exposure to high doses	1. Tank mixtures not recommended between petal fall and first cover to reduce risk of fruit russeting. 2. Use CAUTION or WARNING labels where possible.
C-O-C-S	copper oxychloride, copper sulfate	toxic to fish and aquatic invertebrates	
Cueva	copper octanoate	leaching risk to ground and surface water	
Cuprofix Ultra 40 Disperss	copper sulfate	toxic to bees	
Flowable Sulfur	sulfur	toxic to small mammals and fish	
Lime-Sulfur Solution	calcium polysulfide	toxic to birds, surface water contaminant	
Penncozeb, Manzate, Dithane	mancozeb, maneb	probable carcinogen, developmental toxin, suspected endocrine disruptor, acute aquatic toxicity	1. Selecting mancozeb reduces the high-inhalation risk associated with metiram. 2. Avoid applying EBDCs after bloom to preserve mite predators
Polyram 80 DF	metiram	probable carcinogen, developmental toxin, suspected endocrine disruptor, acute aquatic toxicity	Avoid applying EBDCs after bloom to preserve mite predators
Phostrol, Reliant	phosphorus acid	toxic to fish, surface water contaminant	
ProPhyt	potassium phosphite	toxic to fish, surface water contaminant	
Scholar SC	fludioxonil	toxic to fish and aquatic invertebrates	
Syllit FL	dodine	acute toxicity to workers, resistance	Do not use where resistance is suspected.
Topsin	thiophanate-methyl	likely carcinogen, reproductive/developmental toxin, potential groundwater contaminant, resistance	Use only where history of summer disease.
Vangard WG	cyprodinil	toxic to fish and aquatic invertebrates, potential groundwater contaminant	Recommended for using during cool and wet weather.

MODERATE to HIGH-RISKPESTICIDES, NO RESTRICTIONS BEYOND THOSE ON THE PRODUCT LABEL			
Trade Name	**Active Ingredient**	**Concerns**	**Best Practice**
Weed Management			
Aim EC	carfentrazone-ethyl	acute toxicity to wildlife, fish, aquatic invertebrates	May also be used for control of root suckers.
Alion	indaziflam	acute toxicity to wildlife, fish, aquatic invertebrates, potential/ known groundwater contaminant	
Chateau	flumioxazin	toxic to aquatic invertebrates	
Fusilade DX	fluazifop-P-butyl	toxic to fish, possible reproductive/developmental toxin	
Matrix	rimsulfuron	potential groundwater contaminant	
Poast Herbicide	sethoxydim	potential groundwater contaminant	
Prowl H2O	pendimethalin	possible carcinogen, suspected endocrine disruptor, moderate aquatic toxicity	
Rely	glufosinate-ammonium	moderate risk bird reproductive	
Roundup, Cornerstone, Makaze, Credit	glyphosate	resistance, surface water contaminant, probable carcinogen	May cause tree injury if applied after July 1st.
Sandea	halosulfuron-methyl	possible carcinogen, moderate aquatic toxicity	
Scythe	pelargonic acid	acute toxicity to workers	
Starane Ultra	fluroxypyr-methyl	toxic to fish	Must have supplemental label.
Stinger	clopyralid	potential groundwater contaminant, resistance	
Treevix	saflufenacil	potential surface and groundwater contaminant	
Venue	pyraflufen-ethyl	moderate aquatic toxicity, potential groundwater contaminant	
Other			
Accede	1-aminocyclopropane	acute toxicity to workers, aquatic toxicity	
Amid-Thin W	1-naphthaleneacetamide	high acute toxicity to workers	
ProTone	S-Abscisic Acid	aquatic toxicity	OMRI approved

USE WITH RESTRICTIONS (MODERATE to HIGH-RISK PESTICIDES), RESTRICTIONS WHICH EXCEED THE PRODUCT LABEL

1. These pesticides have additional restrictions which supersede the pesticide label to mitigate moderate to high risks to environmental and human health.
2. Use with justification and only when less hazardous alternatives (e.g., those listed above) are not adequate.
3. Use only after systematic scouting or weather monitoring and science-based thresholds, or according to previous history where thresholds are not available.
4. Pesticides included are not a guarantee of efficacy. Some products will not be as effective as other products against specific target pests.

Trade Name	Active Ingredient	Concerns	Truearth Restrictions	Best Practice
Insect/Mite Management				
Insecticide-coated apple maggot spheres			Insecticide-coated spheres may only be used through participation in Extension or United States Department of Agriculture research.	
Altacor	chlorantraniliprole	toxic to aquatic organisms and certain beneficials, potential groundwater contaminant	Do not expose more than one generation of the target pest to this mode of action alone.	
Delegate WG	spinetoram	toxic to bees, toxic to aquatic invertebrates	Do not expose more than one generation of the target pest to this mode of action alone.	
Exirel	cyantraniliprole	highly toxic to bees, toxic to aquatic invertebrates, potential groundwater contaminant	1. Do not apply until after bloom. 2. Do not expose more than one generation of the target pest to this mode of action alone.	
Verdepryn 100 SL	cyclaniliprole	toxic to bees, toxic to aquatic invertebrates	1. Do not apply until after bloom. Do not expose more than one generation of the target pest to this mode of action alone.	
Versys	afidopyropen	Toxic to bees, acute-aquatic toxicity	Do not apply until after bloom.	

USE WITH RESTRICTIONS (MODERATE to HIGH-RISK PESTICIDES), RESTRICTIONS WHICH EXCEED THE PRODUCT LABEL				
Trade Name	**Active Ingredient**	**Concerns**	**Truearth Restrictions**	**Best Practice**
Insect/Mite Management				
Neonicotinoids				
Actara	thiamethoxam	toxic to wildlife, highly toxic to aquatic invertebrates, highly toxic to bees, potential groundwater contaminant	1. Do not apply until after bloom. 2. Do not expose more than one generation of the target pest to this mode of action alone.	These are IRAC 4A neonicotinoids. Rotation between applications of 4C (Closer, sulfoxaflor) and 4D (Sivanto prime, flupyradifurone) neonicotinoids may not provide adequate resistance management.
Assail	acetamiprid	toxic to wildlife, toxic to bees, may result in spider mite flare up, potential groundwater contaminant	Do not expose more than one generation of the target pest to this mode of action alone.	
Belay	clothianidin	toxic to aquatic invertebrates, highly toxic to bees, potential groundwater contaminant	1. Do not apply until after bloom. 2. Do not expose more than one generation of the target pest to this mode of action alone.	
Admire Pro, Alias, Montana	imidacloprid	toxic to aquatic invertebrates, toxic to bees, toxic to earthworms, toxic to wildlife	1. Do not apply until after bloom. 2. Do not expose more than one generation of the target pest to this mode of action alone.	
Disease Management				
Agri-Mycin 17, FireWall	streptomycin sulfate		After bloom, apply only following hail or wind damage in orchards with existing infections. *Post-bloom application is also allowed for blister spot on susceptible varieties, e.g., Crispin, Mutsu*.	Apply only for fire blight according to a weather-based forecasting program, e.g., Maryblyt or CougarBlight.
Kasumin	kasugamycin		After bloom, apply only following hail or wind damage in orchards with existing infections.	Apply only for fire blight according to a weather-based forecasting program, e.g., Maryblyt or CougarBlight.

USE WITH RESTRICTIONS (MODERATE to HIGH-RISK PESTICIDES), RESTRICTIONS WHICH EXCEED THE PRODUCT LABEL				
Trade Name	**Active Ingredient**	**Concerns**	**Truearth Restrictions**	**Best Practice**
Disease Management				
Badge SC Badge X2	copper hydroxide, copper oxychloride	acute toxicity to workers, toxic to fish and aquatic invertebrates, toxic to bees	Badge SC: Use CAUTION label formulation only. Badge X2: Use WARNING label formulation only.	
Champ, Kocide	copper hydroxide	acute toxicity to workers, toxic to fish and aquatic invertebrates, toxic to bees	Use CAUTION or WARNING label formulations only.	
SDHIs				
Aprovia	benzovindiflupyr	acute toxicity to workers, resistance	1. Must be tank mixed with a protectant fungicide. 2. May be used alone within 30 days of harvest, however, must be tank mixed with a protectant if active scab lesions are present at time of application.	Apply before apple-scab infections to delay resistance.
Excalia	Inpyrfluxam	potential ground and surface water contaminate. Toxic to fish and aquatic invertebrates.		1. Limited to two applications per year as per label. 2. See label for additional restrictions unique to this product.
Fontelis	penthiopyrad	suspected carcinogen, reproductive/ developmental toxin		1. Apply before apple-scab infections to delay resistance. 2. Tank mixes of captan and Fontelis have been phytotoxic to foliage. 3. Do not tank mix with thinning agents.
Luna Sensation	fluopyram, trifloxystrobin	possible carcinogen, developmental and reproductive toxin		1. Apply before apple-scab infections to delay resistance. 2. Recommended to tank mix with captan if bitter rot is evident on some fruit in the orchard.
Merivon	fluxapyroxad, pyraclostrobin	potential groundwater contaminant		
Miravis	Pydiflumetofen	toxic to algae, aquatic invertebrates and fish		Apply before apple-scab infections to delay resistance.

USE WITH RESTRICTIONS (MODERATE to HIGH-RISK PESTICIDES), RESTRICTIONS WHICH EXCEED THE PRODUCT LABEL				
Trade Name	**Active Ingredient**	**Concerns**	**Truearth Restrictions**	**Best Practice**
Disease Management				
Strobilurins (Qols)				
Flint	trifloxystrobin	toxic to fish and aquatic invertebrates, possible carcinogen, resistance	1. Must be tank mixed with a protectant fungicide. 2. May be used alone within 30 days of harvest, however, must be tank mixed with a protectant if active scab lesions are present at time of application.	Recommended to tank mix with captan if bitter rot is evident on some fruit in the orchard.
Pristine	boscalid, pyraclostrobin	possible carcinogen, toxic to fish and aquatic invertebrates	1. Must be tank mixed with a protectant fungicide. 2. May be used alone within 30 days of harvest, however, must be tank mixed with a protectant if active scab lesions are present at time of application.	1. Use only in rotation with a different mode of action. 2. Do not use back-to-back applications. 3. Recommended to tank mix with captan if bitter rot is evident on some fruit in the orchard.
Sovran	kresoxim-methyl	likely carcinogen, suspected groundwater contaminant	1. Must be tank mixed with a protectant fungicide. 2. May be used alone within 30 days of harvest, however, must be tank mixed with a protectant if active scab lesions are present at time of application.	Recommended to tank mix with captan if bitter rot is evident on some fruit in the orchard.
Sterol inhibitors (DMIs)				
Ceyva	mefentrifluconazole	toxic to algae, aquatic invertebrates and fish	1. Must be tank mixed with a protectant fungicide. 2. May be used alone within 30 days of harvest, however, must be tank mixed with a protectant if active scab lesions are present at time of application.	Do not use where resistance is known.
Indar 2F	fenbuconazole	toxic to fish, aquatic invertebrates, algae, EPA possible carcinogen related to crystalline silica content, reproductive effects on female animals		

USE WITH RESTRICTIONS (MODERATE to HIGH-RISK PESTICIDES), RESTRICTIONS WHICH EXCEED THE PRODUCT LABEL				
Trade Name	**Active Ingredient**	**Concerns**	**Truearth Restrictions**	**Best Practice**
Disease Management				
Sterol inhibitors (DMIs)				
Inspire Super	cyprodinil, difenoconazole	possible carcinogen, suspected endocrine disruptor, potential groundwater contaminant	1. Must be tank mixed with a protectant fungicide. 1. May be used alone within 30 days of harvest, however, must be tank mixed with a protectant if active scab lesions are present at time of application.	Do not use where resistance is known.
Rubigan EC	fenarimol	suspected endocrine disruptor, resistance	2. Must be tank mixed with a protectant fungicide. 3. May be used alone within 30 days of harvest, however, must be tank mixed with a protectant if active scab lesions are present at time of application.	Do not use where resistance is known.
Procure 480 SC, Trionic 4 SC	triflumizole	acute aquatic toxicity, potential groundwater contaminant, resistance	1. Must be tank mixed with a protectant fungicide. 2. May be used alone within 30 days of harvest, however, must be tank mixed with a protectant if active scab lesions are present at time of application.	Do not use where resistance is known.
Rally 40 WSP	myclobutanil	developmental/ reproductive toxicity, acute aquatic toxicity, resistance	1. Must be tank mixed with a protectant fungicide. 2. May be used alone within 30 days of harvest, however, must be tank mixed with a protectant if active scab lesions are present at time of application.	Do not use where resistance is known.
Topguard Specialty	flutriafol	suspected endocrine disruptor, potential groundwater contaminant	1. Must be tank mixed with a protectant fungicide. 2. May be used alone within 30 days of harvest, however, must be tank mixed with a protectant if active scab lesions are present at time of application.	Do not use where resistance is known.

USE WITH RESTRICTIONS (MODERATE to HIGH-RISK PESTICIDES), RESTRICTIONS WHICH EXCEED THE PRODUCT LABEL				
Trade Name	**Active Ingredient**	**Concerns**	**Truearth Restrictions**	**Best Practice**
Weed Management				
Gramoxone	paraquat dichloride	acute toxicity to workers, potential groundwater contaminant, moderate aquatic toxicity	Must be applied using a tractor with an enclosed cab.	
Select (CAUTION label)	clethodim	potential groundwater contaminant	Use CAUTION label formulations only.	
Sinbar	terbacil	developmental toxin, potential groundwater contaminant	Limited to one application per season	
2,4-D	2,4-D	acute toxicity to workers, possible carcinogen	Application restrictions vary between labels	
Other				
DPA, No Scald, Shield	diphenylamine	acute toxicity to workers	1. CAUTION label formulations may be used as drenches, sprays, flooding, fogging or aerosol. 2. DANGER label formulations may only be used as fogging or aerosol by custom applicators.	
Ethephon	ethephon	toxic to bees, toxic to earthworms	1. May be used for return bloom or thinning. 2. Use for fruit ripening only when directed by the packing house.	
Sevin	carbaryl	extremely toxic to aquatic invertebrates, highly toxic to bees	Apply for fruit thinning only.	

DO NOT USE		
Trade Name	**Active Ingredient**	**Concerns**
Insect/Mite Management		
Agri-Mek, Abba, Temprano	abamectin	acute toxicity to workers, developmental toxin and acute aquatic toxicity, highly toxic to bees
Ambush, Pounce	permethrin	acute toxicity to workers, toxicity to beneficials, possible carcinogen, suspected endocrine disruptor, acute aquatic toxicity, highly toxic to bees, broad spectrum
Apollo	clofentezine	possible carcinogen, suspected endocrine disruptor
Apta	tolfenpyrad	highly toxic to fish and aquatic invertebrates, highly toxic bees
Asana XL	esfenvalerate	extremely toxic to fish and aquatic invertebrates, highly toxic to bees, toxicity to beneficials, suspected endocrine disruptor
Lorsban	chlorpyrifos	acute toxicity to workers, cholinesterase inhibitor, suspected endocrine disruptor, broad spectrum, highly toxic to bees
Diazinon	diazinon	acute toxicity to workers, cholinesterase inhibitor, suspected endocrine disruptor, developmental/reproductive toxin, broad spectrum, highly toxic to bees
Imidan 70-W	phosmet	acute toxicity to workers, cholinesterase inhibitor and broad spectrum, highly toxic to bees
Nexter	pyridaben	acute toxicity to workers, acute aquatic toxicity, highly toxic to bees
Proclaim	emamectin benzoate	toxic to fish, birds, mammals and aquatic invertebrates, Restricted Use Pesticide
Rimon 0.83 EC	novaluron	acute toxicity to freshwater and estuarine/marine invertebrates and fish, runoff potential – especially in poorly drained soils and toxic to bees
Savey 50 DF, Onager	hexythiazox	possible carcinogen, moderate aquatic toxicity
Tourismo	buprofezin, flubendiamide	groundwater contaminant, possible carcinogen
Vydate L	oxamyl	acute toxicity to workers, broad spectrum, highly toxic to bees

DO NOT USE		
Trade Name	**Active Ingredient**	**Concerns**
Disease Management		
Badge X2 (DANGER label)	copper hydroxide, copper oxychloride	acute toxicity to workers, toxic to fish and aquatic invertebrates, toxic to bees
Champ WG (DANGER label)	copper hydroxide	acute toxicity to workers, toxic to fish and aquatic invertebrates, toxic to bees
Ferbam	ferbam	acute aquatic toxicity
Luna Tranquility	pyrimethanil, fluopyram	possible carcinogen, developmental and reproductive toxin
Mankocide (DANGER label)	copper hydroxide, mancozeb	acute toxicity to workers, toxic to fish and aquatic invertebrates, toxic to bees, earthworms, probable carcinogen, developmental toxin, suspected endocrine disruptor, acute aquatic toxicity
Mertect 340-F	thiabendazole	possible carcinogen, developmental toxin
Omega 500F	fluazinam	toxic to fish and aquatic invertebrates, possible carcinogen
Ridomil Gold SL	mefenoxam	acute aquatic toxicity
Scala SC, Penbotec	pyrimethanil	possible carcinogen and suspected endocrine disruptor
Thiram Granuflo	thiram	reproductive/developmental toxin, suspected endocrine disruptor
Ziram 76 DF	ziram	acute toxicity to workers, likely carcinogen, developmental/reproductive toxin and suspected endocrine disruptor
Weed Management		
Casoron 4G	dichlobenil	possible carcinogen, potential groundwater contaminant, moderate aquatic toxicity
Diquat SPC 2L	diquat dibromide	potential groundwater contaminant, moderate aquatic toxicity
Direx 4L, Karmex DF	diuron	known carcinogen, developmental toxin, acute aquatic toxicity, toxic to birds, potential ground and surface water contaminant
Gallery 75 DF	isoxaben	possible carcinogen, potential groundwater contaminant, moderate aquatic toxicity
GoalTender	oxyfluorfen	possible carcinogen, acute aquatic toxicity
Kerb	propyzamide	probable carcinogen, potential groundwater contaminant, moderate aquatic toxicity
Select 2 EC (WARNING label)	clethodim	acute toxicity to workers, potential groundwater contaminant
Simazine 4L	simazine	possible carcinogen, reproductive toxin, known groundwater contaminant, acute aquatic toxicity
Solicam DF	norflurazon	possible carcinogen, known groundwater contaminant, moderate aquatic toxicity
Surflan AS	oryzalin	likely carcinogen, potential groundwater contaminant, acute aquatic toxicity

IV. Acknowledgements & References

The Truearth protocol builds on the collaborative efforts of scientists, growers and other agricultural professionals who developed the Red Tomato Eco Apple Protocol. The following organizations and individuals provided helpful comments or funding for development of the Red Tomato and Truearth Protocols:

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USDA CSREES Northeastern IPM Center
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USDA CSREES Crops at Risk Program
Wescott Agri Products

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V. Revisions to the 2024 edition

Minimum Requirements

Practice 32. Pg. 12, practice has been updated to:

- Are orchard borders assessed for pollinator habitats (nesting and forage sites), and if present are these habitats protected from drift using one or more of the following mitigation strategies? S, D Please select all that apply:
    a. Pesticides toxic to pollinators are not applied when native pollinators are actively foraging.
    b. Windspeed and wind direction is monitored and used to prevent pesticide drift to pollinator habitats.
    c. Maps outline location of pollinator habitats are used to educate applicators on sites where drift must be avoided.
    d. Other, please list:

Practice 33. Pg. 12. New practice added: Are pesticides with an EPA pollinator toxicity advisory box on the label not applied between pink and end of crop bloom? (See link on pollinator advisory above)

Advanced Practices

Practice 75. Pg. 18 has been updated to read:

- Are non-chemical method(s) used to manage weeds and reduce dependence on herbicides on one to ten acres of orchard? An additional point may be scored where practice is implemented on more than ten acres [s] (Please select all that apply):
    Practices applicable to tree row (1 point):
        A. Mulching
        B. Cultivation
        C. Close mowing/String trimming
    Practices applicable to drive row (1 point):
        D. Aeration
        E. Over-seeding
        F. Mow and blow

Practice 82. Pg. 19 has been updated to read:

- During orchard renovation are practices used to improve infiltration, aeration, retain water and breakup compaction, while minimizing soil disturbances? s Select all that apply:
    a. Tillage radishes are used to break up compaction and improve infiltration.
    b. Cover crops used to improve organic matter and water retention.
    c. Sub-soil ripping without cultivation in drive rows to aerate and improve water infiltration.

Pesticide Use Restrictions

The following products and active ingredients have been added to the do not use list:

- Pg. 37. Lorsban (chlorpyrifos)
- Pg. 37. Diazinon (diazinon)

VI. Participating Grower Affidavit and Agreement

1. Participating grower certifies that the attached Self-Assessment and records represents a complete and accurate account of grower practices on acres to be certified at the time the Self-Assessment is completed and reviewed by the inspector and the IPM Institute for the purposes of certifying participating production.

2. Participating grower agrees to allow access to farm and records for scheduled inspections to verify compliance with program requirements including information provided on the Self-Assessment and use of Truearth Certified packaging and promotional materials.

3. Participating grower agrees that Truearth Certification is approved solely by the IPM Institute of North America, Inc. and if granted, is for one season only and only for product from participating production areas reported in this Self-Assessment and certified by the IPM Institute.

4. Participating grower agrees not to market any product as Truearth Certified apples, including use of Truearth Certified packaging or other Truearth Certified promotional materials or identification, until certification for the product is approved in writing by the IPM Institute. Participant further agrees that if certification is not approved, no product will be marketed as Truearth Certified apples and no packaging or promotional materials bearing Truearth Certified identification will be used. Participant agrees to bear any costs associated with denial of certification including the cost of Truearth Certified packaging and promotional materials purchased by the grower.

5. Participating grower acknowledges that participation does not constitute or imply an endorsement by the IPM Institute of North America or Wescott Agri Products of the participating grower or operation.

Participating Grower Name	Signature	Date

VII. Submission Checklist

____ a. Completed Self-Assessment

____ b. Pesticide, fertilizer, thinner, plant growth regulator, mating disruption, herbicide and rodenticide application records for blocks to be certified. See page 3 for required information.

The IPM Institute can digitize spray records not submitted in an electronic format. This service will be charged based on an hourly rate for time required for digitization and a final copy of the electronic record will be sent to the grower.

____ c. Scouting records for blocks to be certified. See page 3 for required information.

____ d. Certification fee. The annual-certification fee is based on the number of acres of apples enrolled in the program and does not cover costs of on-site audits required every three years. Fees for on-site audits are payable to the IPM Institute of North America.

0 – 9 acres	$450
10 – 24 acres	$550
25 – 49 acres	$700
50 – 99 acres	$800
100 – 149 acres	$1,000
150 – 199 acres	$1,200
200 – 299 aces	$1,500
≥ 300 acres	$2,000

Annual certification fee $_____with the 2024 Truearth Self-Assessment, pesticide application and scouting records are due by **Friday July 12, 2024**. Final application and scouting records are due by **Friday December 6, 2024**. Payment is accepted by check or credit card. To pay by credit card please visit our secure website, ipminstitute.org/projects/truearth/online-payment/, or call 608 232-1410.

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