

**Commodity Specific Definitions for IPM in Fruit Crops in New Jersey  
Apples - Crop Year 2000**

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**Background**

Integrated Pest Management programs (IPM) represent a multidisciplinary approach to crop management. All available techniques are used to manage pest populations below economically damaging levels and to optimize plant health and crop quality. An integrated approach relies on a solid monitoring foundation. In order to be fully functional, monitoring results must be put into action and result in applied management practices. The resulting practices can be classified into different types, with specific practices for each crop grouped under each practice type. A fully integrated program will consist of the following types of practices:

**Type Classification**

IPM fruit programs are based on:

- 1) Cultural and irrigation practices.
- 2) Soil and nutrient management.
- 3) Proper pesticide application and record keeping.
- 4) Insect/Arthropod pest management.
- 5) Disease pest management.
- 6) Weather and crop monitoring.
- 7) Vertebrate pest management.
- 8) Weed and ground cover management.
- 9) Biologically intensive pest reduction strategies.
- 10) Education

**Point Values**

Not all practices have the same economic impact, influence fruit quality, or the levels of pesticides and fertilizers used. In other words, some practices have more impact than others in a commercial program. In addition, some growers may wish to certify their fruit as having been produced under IPM practices. Therefore point values have been assigned to address these issues. Growers may not wish to or be able to follow all practices, but a majority of practices should be followed if the production method is to be defined as an IPM program. Where there is no point value assigned, the practice is considered mandatory.

## Practices

### Cultural and Irrigation Practices

- *Annual pruning is done to provide for optimal cropping as well as adequate spray penetration and air circulation.*
- On very dense and vigorous trees, summer pruning is done. **10 pts**
- All prunings are removed or destroyed. **5 pts**
- Significant new irrigation consists of drip or micro-sprinkler systems. **10 pts**
- Significant new plantings are on improved rootstocks. **10 pts**

### Soil and Nutrient Management Practices

- Soil pH is annually or biannually monitored. **10 pts**
- A complete leaf tissue analysis is done annually. **10 pts**
- All lime, soil applied fertilizers and foliar nutrients are applied according to leaf tissue analyses and soil pH results. **10 pts**

### Pesticide Application and Record Keeping

- *Only registered pesticides are used, and at no more than label rates. Application records are maintained.*
- Pesticides applied based on scouting results and/or pest phenology models. **20 pts**
- The orchard airblast sprayer(s) is calibrated at the start of every growing season, and either recalibrated or the spray pattern checked again at mid-season. **20 pts**
- Tree-row volume has been calculated for various size trees in different blocks, and pesticides are applied according to TRV calculations where possible. **10 pts**
- Alternate row middle spraying is used with appropriate materials whenever possible, along with reduced pesticide rates. **10 pts**
- Pesticides are used that conserve beneficial insects and other natural enemies. **10 pts**
- A resistance management plan is used for specific pests and pesticides when appropriate. This includes the use of oil and rotation of miticides for mite control, and alternating fungicide types and SI materials for scab control. **10 pts**

### Insect/Arthropod Pest Management

#### Monitoring

- *All major insect and mite pests are scouted in a scientifically valid manner.*
- Records are maintained of all scouting results and used for all insecticide and/or miticide applications. **20 pts**
- Monitored arthropods include: plum curculio, mites, apple maggot, leafminers, aphids, leafhoppers, San Jose scale, codling moth, and leafrollers. Where appropriate monitoring should also include oriental fruit moth, tarnished plant bug and other true bugs, European apple sawfly, fruitworms, gypsy moth, eastern tent caterpillar, and Japanese beetle. **10 pts**
- Beneficial arthropods should be monitored so that decisions can be made about natural biological control. These include aphid predators such as Syrphid flies, aphid midges, lacewings, and ladybird beetles. A number of mite predators are also present

in apple orchards, and classical IPM programs make use of these naturally occurring predators. These include the small black lady beetle, *Stethorus punctum*; the predatory mite, *Amblyseius fallacis*; as well as other predatory mites in the family Phytoseiidae. Other mite predators include the yellow predatory mite, *Zetzellia mali*; the minute pirate bug, *Orius insidiosus*; the black hunter (a predatory thrips), *Leptothrips mali*; and several species of predatory Mirid bugs. **10 pts**

#### **Actions**

- Pesticide applications are based on action levels, or economic threshold levels when known, and/or pest phenology models. **10 pts**
- The use of synthetic pyrethroids is avoided until August, because their use can lead to high mite populations. **10 pts**
- When sufficient levels of predators are present, the use of aphicides or miticides is reduced, allowing for biological control of aphids or mites. **5 pts**
- One to two applications of dormant oil are used for mite, aphid, and scale suppression. **10 pts**
- Border sprays are used in place of full cover sprays for plum curculio and apple maggot if appropriate. **15 pts**

### **Disease Pest Management**

#### **Monitoring**

- *All major disease pests are scouted in a scientifically valid manner.*
- Records are maintained of all scouting results and used for all fungicide or antibiotic applications. **20 pts**
- Monitored diseases include: apple scab, powdery mildew, cedar apple rust, fire blight, black rot, white rot, sooty blotch, and fly speck. Other diseases such as collar rot, bitter rot, brooks spot, and alternaria should also be scouted for if present in the production area. **10 pts**

#### **Actions**

- The first fungicide spray for apple scab is timed to correspond with ascospore development. **10 pts**
- Fungicides are applied for scab as long as ascospores are released, or through the end of the primary infection period. **10 pts**
- A post infection period program with sterol inhibiting fungicides is used. **10 pts**
- Where cedar apple rust is a problem, red cedars and junipers should be removed from the surrounding area if possible. **10 pts**
- Applications for scab and fire blight, and summer diseases follow recommendation outputs from disease models. **10 pts**
- Scab resistant apples are grown where the markets allow.

**Bonus -** **20 pts**

### **Weather and Crop Monitoring**

- Tree phenology is monitored and records maintained. **5 pts**
  - A rain gauge is used and maintained on a regular basis. Records are kept on the accumulated amount of precipitation that occurs between fungicide sprays. **10 pts**
- And one of the following:*

- A max. – min. thermometer is used to calculate daily degree day accumulations, used for modeling insect and disease development; *and*
  - A leaf wetness meter is used to measure the length of wetting periods. Information is combined with temperature data for disease modeling and prediction. **15 pts**
- Or:*
- Contracting with an agricultural weather service or consultant to collect weather data and model insect and disease development. **15 pts**

#### **Vertebrate Pest Management**

- Rodent damage is monitored. **10 pts**
- If rodenticides are applied, they are used in bait stations in place of broadcast treatments. **5 pts**
- Use of soap or fencing for deer. **5 pts**

#### **Weed and Ground Cover Management**

- The herbicide sprayer is calibrated before the start of the growing season. **10 pts**
- Weeds are monitored in the tree row and in the aisles once or twice per year detailing weed density and species present. **10 pts**
- Spot treatment is used if needed. **10 pts**
- Herbicide rates are matched to soil type and organic matter. **10 pts**
- Herbicide materials and rates use according to weed monitoring results. **10 pts**
- Aisles are regularly mowed. **10 pts**

#### **Biologically Intensive Pest Reduction Strategies**

- Removal of wild or abandoned fruit trees or other wild hosts located near the orchard to reduce codling moth, oriental fruit moth and apple maggot populations. **10 pts**
- Use of mating disruption for codling moth.

#### **Bonus** **30 pts**

- Use of sticky red spheres around border to trap out apple maggot flies and prevent their entry into the orchard. **10 pts**
- Introduction of mite predators or other beneficials into the orchard.

#### **Bonus** **10 pts**

#### **Education**

- Attendance at cooperative extension fruit meetings. **10 pts**
- Attendance at commodity organization fruit meetings. **5 pts**
- Uses current copy of state commercial tree fruit production guide. **10 pts**
- Subscribes to state extension fruit newsletter. **10 pts**

Total points not including bonus points = 480. Bonus points = 60