Pesticide Storage Area Recommendations

- **Temperature**... Avoid storing pesticides in hot places
  Pesticides should be stored out of the sun, away from furnaces or other sources of heat. Building temperatures should be kept under 95 degrees Fahrenheit and above pesticide freezing points. Follow any additional storage instructions provided on the label.

- **Ventilation** ..... Must be well ventilated
  The building should have a ventilation system sufficient to prevent accumulation of vapors. Consider installing an electric fan with a switch on the outside of the structure to ensure rapid ventilation.

- **Shelving** ... Built with sturdy materials
  Preferably metal or plastic shelves with lips to prevent tumbles. All containers are to be off the floor.

- **Lighting** ... Storage area needs to be well lit to see labels.

- **Pesticide Weight** ...... Heavy drums on lower shelves / Light packs on top shelves.

- **Labels** ......Warning statements need to be clearly visible.

- **Rotation** .... Rotate stock; keep oldest at the front.

- **Floor**...... Base should be impermeable with curbs or dikes to contain leaks.

- **Security** .... Build a fence around the area. At the very least, keep doors locked.

- **Safety**...... List chemicals stored. Have the list of chemicals (or copies of the labels) and a spill kit readily available within the storage area.

References: DSHM-PES-0503, Pesticide Storage Guidelines; Colorado State University Cooperative Extension, Mile High Growing Newsletter, April 2000, Vol. 12, No. 4
Storage Facility Safety Check List

- ✔ Separated from office, workshop, food …………………….. Y __ N __
- ✔ Separated from wells and surface water by at least 100 ft... Y __ N __
- ✔ Fire resistant building materials …………………………….. Y __ N __
- ✔ Impermeable flooring ………………………………………… Y __ N __
- ✔ Liquid spill containment (berms or sump, 25% of liquid storage) … Y __ N __
- ✔ Anti-spark electrical components ………………………….. Y __ N __
- ✔ Heating system (maintained above 32 degrees F) …………. Y __ N __
- ✔ Ventilation system with an outside switch ………………….. Y __ N __
  (vent vapors/maintain below 95 degrees F)
- ✔ Locked doors ………………………………………………… Y __ N __
- ✔ Fenced ………………………………………………………… Y __ N __
- ✔ Warning signs posted ……………………………………….. Y __ N __
- ✔ Sturdy shelves for off floor storage …………………….. Y __ N __
- ✔ Emergency eyewash and shower immediately available ... Y __ N __
- ✔ Routine wash-up facilities near by ………………………….. Y __ N __
- ✔ Spill kit and fire extinguishers readily available …………. Y __ N __
- ✔ Personal protective equipment available …………………….. Y __ N __
  (outside of, but near storage area)
- ✔ First aid kit ………………………………………………….. Y __ N __
- ✔ Prepared emergency response plan on file …………………. Y __ N __
- ✔ Pesticide inventory on file …………………………………….. Y __ N __

References: Core Manual, Northeastern Regional Pesticide Coordinators, 2nd Edition;
Virginia Farmstead Assessment System Fact Sheet No. 7 Pesticide Storage, Handling, and Management
What security measures are taken at the storage area?

Security Measures

- Storage area should remain locked when not in use.
- The storage area should be fenced in or at least able to be securely locked.
- Prominent, weatherproof warning signs should be posted on every door.
- Have a basic fire response plan prepared and submit it to the fire department.
- Pesticide storage tanks should have locked inlet and outlet controls.
- Tanks should be secured by fences or stored inside locked facilities.

References: DSHM-PES-05-03 Pesticide Storage Guidelines; NYS Department of Environmental Conservation Pesticide Safety Education Core Manual
Storage Duration

✓ **It is best not to have surplus pesticides.**
   Purchase only what you know you will use.

✓ **If material is stored:**
   Always store pesticides in their original containers with the labels securely attached and plainly visible.

✓ **Mark each container with the purchase date.**

✓ **Keep a complete inventory of all products.**
   Have list readily accessible in a separate building.

✓ **Store herbicides separately from other pesticides.**
   Some herbicides are volatile and readily contaminate other chemicals.

✓ **Inspect containers periodically for signs of leakage, severe damage, or other defects.**

✓ **Pesticides should never be stored in a container other than the original container.**
   If containers are damaged, transfer contents immediately to a clean and suitable larger container which can be sealed and labeled. Remove the label from the damaged container and fasten it firmly to the new container. Or, print a copy of the label from Cornell University’s PIMS website to attach to the new container.

(\text{http://pmep.cce.cornell.edu/pims/current/})

Pesticide Storage

**AEM Tier 2**

**Pesticide Leachability**

- It is best not to have a surplus of pesticides.
- Know the leaching potential of the stored pesticide.
- Choose pesticides with the least potential for leaching into the groundwater.
- Look for characteristics which identify the pesticide as being insoluble, relatively stable and readily absorbed to soil.
- Read the pesticide label for any warnings of leachability. The Environmental Hazards section often includes groundwater advisories and protection information.
- Pesticide containers should be kept tightly sealed when in storage.
- Inspect periodically for signs of leakage, severe damage, or other defects.

**Pesticide Containers**

- All pesticide containers should be checked often for leaks and loose caps. You must correct these dangerous conditions immediately. Pesticides should be stored in their original container with the label attached.
- If containers are damaged, transfer the contents to a sound and suitable larger container which can be sealed and labeled.
- Oftentimes the label from the damaged container can be firmly fastened to the new container. Otherwise, print a copy of the label from Cornell University’s PIMS website to attach to the new container. Unlabeled pesticides are illegal and dangerous since you don’t know what they are or how to use them. Label them as “not for use”, set them aside and hold them for disposal.
- Partly empty pesticide containers should be resealed & returned to storage. Keep containers well sealed to avoid vapor buildup.
- Pesticides should never be stored in soda bottles, fruit jars, milk cartons, etc. Storing pesticides in improper containers is a common cause of pesticide poisoning.

**References:** NYS Laws and Regulations, Core Manual Pesticide Safety Education

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If possible, mix and load pesticides on a concrete pad, so that spilled pesticides can be removed and not absorbed into the ground.

If there is no impermeable mixing and loading pad, the risk of contamination can be minimized by following some basic guidelines:

- Rotate the mixing site within the field of application to avoid build-up of pesticides in the soil.
- Avoid mixing and loading on gravel driveways or other surfaces that allow spills to sink quickly through the soil.
- Carefully choose the pesticide mixing and loading area. It should be outside, away from other people, livestock, and pets.
- Pesticides should not be mixed in areas where a spill or overflow could get into a water supply.
- Stay away from any well - including drainage wells and abandoned wells.

NRCS AMF standard NY-702 requires a minimum of 100 feet from private wells or surface water bodies and 500 feet from wells used for public water supply.

- Follow any additional state and label requirements.
- Measure accurately; follow label instructions and mix only the amount you plan to immediately use.

All measuring devices - spoons, cups, scales - should be labeled and kept in the pesticide storage area and should never be used for other purposes.

Protect Water Sources

Many groundwater contamination problems are associated with mixing and loading of pesticides near wellheads. Pesticides applied close to wells can contaminate the groundwater by moving through the well.

Pesticide Spill Kit

Spill Kits Should Contain:

- Gloves (nitrile, at least; foil barrier laminate better)
- Goggles
- Chalk or grease pencil (for marking spill area on floor)
- Dust pan or small shovel (plastic preferable)
- Small broom
- Spray bottle (for wetting down small spills)
- Paper towels
- Permanent marker (for marking spill container after clean-up)
- A container with lid to put contaminated waste in
- Tyvek coveralls
- 20-gal hazardous material temporary storage bags
- Sorbent pad or tube sock for water or solvent-based chemicals
- Loose absorbent (kitty litter, saw dust, etc.)
- Sweeping compound
- Warning sign

In addition:

- Label the spill kits: “For Pesticide Use Only”
- List items in the kit and tape to the lid or place in a plastic bag in the kit
- Tape the kit closed after checking contents (lightly but visibly) so you can see when it has been disturbed

Mixing and Loading Area

- Carefully choose the pesticide mixing and loading area. It should be outside, away from dwellings, livestock and pets. Pesticides should not be mixed in areas where a spill or overflow could get into a water supply.

- Sites for loading and mixing of pesticides should be located as far away from points of entry to surface or groundwater as possible. The NRCS Agrichemical Mixing Facility standard NY-702 requires a minimum of 100 feet from private wells or surface waterbodies and 500 feet from wells used for public water supply. At least 200 feet from private wells will lower the risk and is suggested whenever feasible.

- Mix and load agricultural chemicals and rinse equipment on an impervious surface with a curb to control spills, minimize soil contamination, and reduce risks of pesticides leaching into groundwater.

- A pesticide that is spilled near water sources, such as wells or streams, could move over or through the soil and reach the water source.

- Small quantities spilled regularly in the same place can go unnoticed, but the chemicals can build up in the soil and eventually reach groundwater. By mixing and loading on an impermeable surface, such as concrete, you can contain and reuse most spilled pesticides.

- Even if there is no impermeable mixing and loading pad, the risk of contamination can be minimized by following some basic guidelines:
  - Rotate the mixing site within the field of application to avoid build-up of pesticides in the soil.
  - Avoid mixing and loading on gravel driveways or other surfaces that allow spills to move quickly into the soil.
  - Stay away from any well (including drainage wells and abandoned wells), stream or sinkhole during mixing and loading operations. Use a nurse tank to transport water to the mixing and loading site.

References: DSHM-PES-05 Pesticide Storage Guidelines, NY State DEC Program Policy; Cornell University PMEP; Reducing the Risk of Groundwater Contamination by Improving Pesticide Storage and Handling, New Mexico Farm-A-Syst Fact Sheet #2 <http://cahe.nmsu.edu/farmasyst/pdfs/2fact.pdf>
All certified applicators who draw water from any water source must use a backflow prevention device (BPD) installed between the water source and mixing tank.

**Only 2 types of Backflow Prevention Devices are acceptable for use with pesticides in New York:**

1. Reduced pressure zone devices (RPZ)
2. Air-gap devices

**GUIDELINES FOR FILLING SPRAYER TANK:**

- **Never** put the hose into the sprayer tank.
- Maintain a fixed air-gap at least twice the diameter of the fill hose above the tank at all times.
- During filling operations, don’t allow the water to back-siphon.
- Use a nurse tank to supply water for mixing so that mixing will occur away from wells and prevent backflow of pesticides into wells.

**References:** Cornell University PMEP; Cornell Cooperative Extension Suffolk County Best Management Practices for Long Island Growers; Purdue University <http://www.purdue.edu/dp/envirosoft/pest/src/mixing.htm>; DEC TAGM PES-98-09 Backflow Prevention Devices <http://www.dec.state.ny.us/website/dshm/pesticid/9809bf1.html>
Suffolk County's AgStewardship Program

Mixing and Loading Practices

Where is the water source?

How is sprayer cleaned and rinsate disposed of?

### Water Source

**Protect Water Sources** –
Areas where pesticides are mixed and equipment is filled have great potential as sites where groundwater can be contaminated with pesticides. Avoid mixing and loading pesticides near your well or any public drinking water supply wells. Pesticides applied close to wells can contaminate the groundwater by moving through the soil and into the well.

- Use a separate water tank such as a nurse tank to transport water to the mixing and loading site. This is the best way to prevent contamination. (Increasing the water supply line so the spray unit can be filled farther from the water source is another option to consider.)

- The water hydrant needs to be at least 100 feet from private wells. Mixing and loading needs to take place at least 100 feet from private wells and surface water bodies, and 500 feet from wells used for public water supply.

These standards apply where pesticides are mixed and loaded and where equipment is cleaned. Pesticides should not be mixed or loaded in areas where a spill or overflow could get into a water supply. The mixing and loading area should be located outside of wetland areas and downslope from any well, surface water and watercourse.

### Cleaning Sprayer & Disposing of Rinsate

**Best Management Practices:**

- Mix only what is needed for that day's jobs.
- Always try to end the day with an empty tank.
- Choose the washing area carefully. Avoid contamination of water supplies and injury to plants or animals.
- Always flush with clean water, inside and out, to prevent corrosion and accumulation.
- Dispose of rinsate as directed on the product label. **Waste from equipment cleanup must be kept out of water supplies and streams.**
- Sprayers need to be cleaned to prevent corrosion, to prevent cross-contamination of pesticides or other materials, and to prevent crop injury.
- Do a thorough cleaning with a cleaning solution whenever you change pesticides or prior to storage. Trace amounts of one pesticide can react with another or carry-over to the next spraying causing damage, especially with herbicides. The solution used depends on the pesticide to be removed from the sprayer. Check the pesticide label or the CORE Manual on Pesticide Education Safety for cleaning instructions.


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Pesticide Spills

Spills ~ In spite of all safety precautions, accidents can happen. If a pesticide spills in your storage area, quick action must be taken. If the pesticide gets on anyone, have them get out of the area, wash thoroughly, change clothes, and see a doctor if necessary. Clear the storage area except for a small clean-up crew. Be sure the crew wears the proper personal protective equipment.

If the spill is a liquid ~ Your first step is to contain the spill. Throw absorptive clay, vermiculite, pet litter, or sawdust over the entire spill. Use enough to soak up the liquid. Then sweep or shovel it into a large drum.

If the spill is a dust, granular, or powder ~ Sweep or shovel it directly into a large drum. Sweeping compound can be useful when picking up spills of dry pesticides. Next, cover the spill area with a decontamination agent recommended for that particular pesticide. The manufacturer or your supplier may have to be consulted. Hydrated lime and high pH commercial detergents are often recommended. Repeat this procedure several times.

If the spill is on a pad ~ Rinse the whole area with plenty of water. Collect the rinse water and dispose of it appropriately. (See below.) Check your storage area carefully to see if any other pesticides were contaminated by the spill. If so, dispose of them as well.

If the spill is on soil ~ DO NOT hose down the area. Water will spread the pesticide, creating a wider area of contamination. Shovel the top 2-3” of soil into a plastic bag.

Disposal ~ If the spilled chemical is considered hazardous, dispose of all contaminated materials (absorbent materials, soil, porous equipment, gloves, brooms, etc.) through a hazardous waste disposal company. Otherwise, dispose of materials through the normal waste stream. Questions on disposal and spill guidelines? Contact the product manufacturer or call Chemtrec at 1-800-424-9300 or call DEC at 1-800-462-6553.

KEY POINTS

Have a spill kit and emergency response plan accessible.

Clean up spills immediately.

Identify the source and try to stop it. Isolate the area.

Contain liquid spills. Construct a dam to prevent from spreading. Soak up the spill with absorbent material.

Wear protective gear.

Sweep up dry spills; reuse pesticide as it was intended.

For soils, shovel the top 2 to 3 inches of soil into a heavy duty plastic bag. Cover with at least 2 inches of lime. Do not hose down the area!

Inspection and Emergency Plan

A routine inspection plan can help prevent contamination from occurring. Check application equipment regularly for leaks and malfunctions. Inspect wells and pumps regularly for leaks and ensure that the seal is adequate to prevent pesticides from entering the well.

Prepare an emergency response plan. All employees or persons having access to the pesticide storage area should be familiar with the plan. In addition, the local fire department, rescue squad and local hospital should also be given copies of this plan.

Maintain a current inventory of the pesticides in storage. Keep a copy of the inventory list at a location removed from the storage area and accessible in the event of an emergency involving the pesticide storage area.

Spill kits and fire extinguishers appropriate for all stored pesticides should be readily available but not kept within the pesticide storage area.

Provide personal protection equipment near, but outside of, the storage facility. Emergency response information, written standards for pesticide segregation pertinent to the facility, and postings and warnings in compliance with OSHA Hazard Communication and Worker Protection Standards should be displayed in a central location for all employees.

Conduct training sessions on safe pesticide handling; spill prevention and response (containment and cleanup); and selection, use and maintenance of personal protection equipment.

Recycling and Container Disposal

Unwashed and improperly stored containers can lead to groundwater contamination if chemical residues leak onto the ground.

Pesticides must be disposed of in accordance with the laws and regulations of NY State.

Following these basic guidelines can help prevent groundwater contamination:

⇒ Pressure-rinse or triple rinse all plastic containers immediately after being emptied, since residue can be difficult to remove after it dries.
⇒ Pour the rinse water into the spray tank to avoid disposal problems.
⇒ Puncture containers and store them in a covered area until you dispose of them.
⇒ Use returnable containers and minibulks, and take them back to the dealer as often as possible.
⇒ Recycle plastic containers through the distributor or at the Long Island Cauliflower Association. Triple-rinsed containers can also be disposed of through your local waste management facility.
⇒ Shake out bags, bind or wrap them to minimize dust, and dispose of them through the local waste management facility.
⇒ Do not bury or burn pesticide containers or bags.
⇒ Do not reuse pesticide containers for any other purposes.

For NY State regulations regarding container cleaning and disposal and reuse of pesticide containers, refer to: NYS Department of Environmental Conservation’s Rules and Regulations Part 325, Application of Pesticides, Sections 4 and 5. (http://www.dec.state.ny.us/website/regs/part325.html)

References: Harris, B.L. et. al. Reducing the Risk of Groundwater Contamination by Improving Pesticide Storage and Handling. Texas Agricultural Extension Service; Cornell Cooperative Extension Suffolk County Best Management Practices for Long Island Growers
Proper Disposal of Unused and Banned Pesticides

These basic guidelines can help minimize excess pesticides and prevent groundwater contamination.

Prior to purchase:
- Estimate your pesticide needs

At time of purchase:
- Buy only what you need
- Buy products in returnable containers

After you purchase:
- Mix only enough product for the job at hand, to help reduce container and chemical cleanup and disposal needs.
- Maintain an inventory of all stored pesticides. Mark containers with date of purchase.

Pesticides must be disposed of in accordance with the laws and regulations of NY State.

Points to Remember:
- Pesticides which are still factory sealed may be returned to the dealer/distributor. Check with the company to see if they will take your surplus back.
- Consider transferring your excess DEC labeled non-restricted use pesticides to another certified applicator who is able to use the pesticide to control a similar pest problem.
- Banned pesticides should be set aside until the next Clean Sweep event and labeled as “not for use”. (The NYS DEC holds these events periodically to properly discard of hazardous materials and waste.) Call DEC’s Central Headquarters in Albany at 518-402-8788 for more information or visit: www.cleansweepny.org
- Alternatively, you can arrange for a licensed hazardous waste disposal company to pick up and dispose of any unwanted pesticides.
- Any pesticide in a damaged container or at risk of leaking should be placed in secondary containment and disposed of as soon as possible.
- Contact your local waste management facility for information on what you can dispose of at their location.

References: Core Manual Pesticide Safety Education; Cornell Cooperative Extension Suffolk County Best Management Practices for Long Island Growers; AEM Tier II Pesticide Management worksheets, Long Island Stewardship Program
Sprayer Maintenance Recommendation

All pesticide application equipment should be properly maintained and calibrated on a regular basis. The sprayer must put out the correct gallonage per acre and each nozzle must deliver an equal share of that amount.

**Equipment Maintenance Includes**

- Regular maintenance of nozzles. (This is essential for accurate pesticide application; accurate application can never be achieved with improper or worn nozzles.)
- Protect nozzles from grit and dirt by adequate screens.
- Sprayers should be thoroughly rinsed between applications of different pesticides. Clogged tips should be cleaned with a soft, bristled brush only, never use a metal object. Use extreme care with soft tip materials such as plastic and brass.

**When to Calibrate Equipment**

- Prior to the application of pesticides
- Prior to each season of application (at a minimum)
- When a change in pesticide application is made

**Why it is Important to Calibrate Equipment**

- To prevent an ineffective application.
- Over application will result in a more costly operation.
- Over application will likely cause off-target environmental contamination.
- Under application of materials may result in poor control.
- Under application could require repeated applications, which will be more costly.
- It is illegal to apply pesticides at a rate higher than the rate listed on the label.

Suffolk County's AgStewardship Program

Pesticide Use

AEM Tier 2

Pest Management Recommendations

**Spray Application Recommendations**

- Pesticides must be used in an appropriate manner to prevent contamination of environmentally sensitive areas such as wetlands, wells and surface waters. This includes paying attention to weather conditions, such as wind and rain, which can cause off-target movement of product and can impact the efficacy of the application.

- Follow the label restrictions regarding the appropriate distance of spray application from surface water bodies, ponds, wetlands, streams, rivers.

- If there are no specifications given on the label, spray should be applied at least 35 feet from open water sources.

Pesticide Use

Are runoff and leaching potential considered in pesticide selection?

Leaching Potential

Runoff & leaching potential should be a primary consideration in selecting a pesticide. Most land on Long Island has highly permeable, coarse soils underlain by groundwater that is near the surface. As a result, there is an increased potential for groundwater contamination.

Pesticide application methods affect the amount of pesticides subject to leaching. If pesticides are applied directly to the soil, there is a greater probability that more of the product will leach than if applied to the foliage.

Factors that Contribute to Pesticide Leaching Potential

1. Pesticide Properties

   Low adsorptivity – the pesticide is weakly bound to the soil particle and therefore more likely to move through the soil with percolating water rather than staying in the root zone.

   Slow degradation rate – the more time required before a pesticide breaks down, the greater the chance of the chemical leaching into the groundwater.

   High solubility – the pesticide dissolves easily in water and may be dissolved in percolating groundwater and carried to groundwater.

2. Soil Characteristics

3. Site Conditions

To Reduce the Likelihood of Environmental Contamination:

1. Select the pesticide with lowest leaching potential
2. Use the lowest recommended rates
3. Consider alternative pest control practices

For more information on the leachability of a pesticide, consult the technical representative or dealer and the label.

References:
Pesticide Application ~ Minimizing Drift

Through careful planning and preparation “drift can be minimized. Implementing just one of these methods [listed below] will greatly reduce the effects of drift and will improve efficiency of spray application saving you time, money and future problems.” - Andrew Landers, PhD, Cornell University

Before Spraying:
- Train the operator to use the sprayer correctly on your farm under your conditions.
- Plan the spraying operation.
- Read and follow the pesticide label.
- Select the correct nozzle for the target. Adjust the size, position, and orientation of nozzles to achieve correct distribution within the canopy, particularly as the growing season progresses.
- Consider the use of sprayers which direct the spray to the target such as towers and tunnels. Check that air deflectors are set properly to confine disturbance to the target.
- Use spray additives to reduce drift only if they are independently proven to work.
- Improve spraying logistics to ensure adequate time to spray within ‘ideal’ conditions.
- Calibrate the sprayer with water to ensure that everything is working correctly.

During Spraying:
- Stay Alert ~ Ensure the spray is not allowed to drift on to non-target areas. Watch for changes in wind speed and direction.
- Keep spray pressure as low as possible ~ Ensure an accurate gauge is used.
- Maintain a constant speed and pressure ~ If an automatic regulator is fitted, remember: small increases in speed result in large increases in pressure. The delivered air and spray must be given time to penetrate the canopy.
- Avoid spraying near sensitive crops or water courses ~ Use a 50 - 100 feet buffer zone.

Deposition and drift are both determined by a nozzle’s droplet size spectrum. The smaller the particle size, the greater the drift potential.

Droplet size is grouped into 3 categories:
- Fine (119-216 μm), Medium (217-353 μm), Coarse (354-464 μm) (One micron (μm) = 1/25,000 inch)

Fine sprays are prone to drift. Do not use a fine spray for pesticides labeled toxic. Medium Sprays should be used unless another spray quality is indicated. Medium droplets are ideal when foliage is the target. Coarse Sprays have a low risk of drift but should only be used where recommended.

References: Landers, A. Cornell University. “Minimizing Drift” and “Facts on Droplet Size and Drift” <http://www.nysaes.cornell.edu/ent/faculty/landers/estapp>
Consider the Weather Before Applying Pesticides and Increase the Effectiveness of Pesticide Application

Weather Tips to Save Time, Money and Reduce Environmental Risks

- **Avoid high temperature and low humidity conditions**
  Under these conditions, the rate of evaporation is greatly increased. Small droplets that completely evaporate result in pesticide particles that can be carried through the air for several miles (aka vapor drift).

- **Avoid windy days**
  High winds increase drift and result in pesticides being carried away from the treated area. To be safe, never apply pesticides at wind speeds of greater than 10 mph. Remember: it is illegal for pesticides to drift onto non-target areas.

- **Do not apply pesticides just before a rain**
  Rains cause runoff and tend to wash pesticides away from the target area, leaving the pests untreated. Runoff can lead to surface waters and sensitive areas causing unanticipated environmental damage.

- **Consider early morning or evening applications**
  At these times, wind speed is usually lowest and humidity is highest, thus the risk of drift is greatly reduced. Furthermore, by avoiding full daylight hours the contact danger to wildlife, such as birds and pollinators, is reduced.

References: Andrew Landers Cornell University: http://www.nysaes.cornell.edu/ent/faculty/landers/pestapp; CORE manual
Suffolk County's AgStewardship Program

AEM Tier 2 Pest Management Recommendations

Components of an IPM Approach:

<table>
<thead>
<tr>
<th>Preventative Measures</th>
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<tbody>
<tr>
<td><strong>Cultural Controls</strong> ~ to disrupt the environment of the pest. Examples include crop rotation, plowing, and removal of infected plant material.</td>
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<tr>
<td><strong>Biological Controls</strong> ~ using natural enemies to keep pest levels at a minimum before the problem gets out of hand.</td>
</tr>
<tr>
<td><strong>Pheromones</strong> ~ the use of natural insect scents usually emitted by the female insect can confuse the male and prevent mating and therefore future generations.</td>
</tr>
<tr>
<td><strong>Pest-Resistant Varieties</strong> ~ using crop varieties that are less susceptible to certain insects and diseases.</td>
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### Assess the Economic Threshold

The process of determining economic threshold or an intolerable level includes:

- **Forecasting** to help determine if weather conditions will be favorable for the development of diseases and insect pests.
- **Keeping records** from previous years will help to predict and prevent an outbreak.
- **Monitoring/Scouting** - the regular, systematic checking of an area can lead to early detection of pests, allowing you to make pest management decisions before the problem is out-of-control.
- **Proper pest identification** - A misdiagnosis of the problem can lead to improper treatment.

### Economic Thresholds:

Levels that mark the highest point a pest population can reach without risk of economic loss.

Above these established levels, populations can reach the economic injury level where they can cause enough damage for the grower to lose money.

### By knowing and observing thresholds, a grower can avoid spraying if the pest is not at a level that will cause economic loss.

- **Action or Control Measures** Once a pest has reached the economic threshold, action should be taken. The type of action taken depends on the pest and the severity of the situation. The action taken could be cultural, such as harvesting early to avoid pest problems and to prevent crop loss, or the action could be the decision to use pesticides. Pesticides should be used when no other strategies will bring the population below the economic threshold level.

References: Core Manual Pesticide Safety Education; Conservation Technology Information Center, Core 4 Conservation IPM Resources <http://www.conservationinformation.org/?action=learningcenter_core4_whatscore4>
Recommendations for Integrated Crop & Pest Management

Learn to:

☑ Recognize the common pests that you work with and their hosts.
☑ Properly identify a pest and know its life cycle.
☑ Know the best time to control the pest.
☑ Choose the proper pesticide and learn when you can use the lowest recommended rate.
☑ Avoid injury to the host.
☑ Avoid injury to non-target areas.
☑ Incorporate scouting into crop management activities to help determine when a pest has reached its economic threshold level.

Knowledge & Skills Relating to Integrated Pest Management

Effective pest control requires an understanding of the cultural, biological, chemical, and field management procedures used in an integrated pest management (IPM) approach.

By practicing IPM, pesticide use can be greatly reduced, saving both time and money, while preserving beneficial organisms and ultimately reducing the risk to surface water and groundwater.

Reference: Core Manual Pesticide Safety Education

Suffolk County's AgStewardship Program AEM Tier 2
Pest Management Recommendations

Integrated Crop Management

Does grower have knowledge and skills relating to IPM?

Suffolk County Soil & Water Conservation District USDA Natural Resources Conservation Service

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**Top 10 Management Tips**

**Soil Management:**
Providing sufficient amounts of crop residue on the soil surface increases organic matter of the soil. Soil testing and applying proper amounts of macro and micronutrients provides for the optimum growing environment.

**Cultural Practices:**
The pest's environment is disrupted by rotating crops, and timely harvesting of crops. Planting cover crops can suppress weed pressure and provide nitrogen and better soil tilth.

**Planting:**
Plant crops that have good vigor and that can tolerate or resist common problems. The timing of planting should coincide within the optimum planting dates recommended. Row spacing, intercropping, trap crops and other alternative strategies can be looked at to discourage or detract pests.

**Pest Trapping:**
Traps that attract insects are placed near target crops. This can be done in conjunction with a larger network within state or multi-state areas to track infestations of some insects. This information can be utilized later when populations reach a critical point.

**Monitoring:**
Growers or scouts should use a systematic approach to regularly inspect representative areas of the fields to determine if pests are approaching a damaging level.

**Forecasting:**
Site specific or local weather data is consulted to predict if and when pest outbreaks will occur. Treatments can then be properly timed, preventing crop damage and saving spray applications.

**Biological Controls:**
Growers should promote and attract many natural enemies that can inhibit pest populations. Import and use additional biologicals where cost effective.

**Thresholds:**
Before treating, the pest population should reach a level that could cause economic damage. Until that threshold is reached, the cost of yield and quality will be far less than the cost for control.

**Chemical Controls:**
Growers select the most effective and appropriate pesticide and properly calibrate sprayer. Weather conditions are checked prior to spraying to assure proper coverage and minimum drift.

**Record Keeping:**
Records of soil management, planting dates, weather data, treatments and other appropriate information are kept for future weed and pest management decisions.

References: Conservation Technology Information Center, Core 4 Conservation IPM Resource <http://www2.ctic.purdue.edu/Core4/ipm/Top10.html>
Bare soil is susceptible to wind and water erosion, and to drying and crusting. A cover crop is a crop grown to cover the soil. It may either be tilled into the soil as a “green manure” or used as a living or dead mulch on the soil surface. A cover crop may, or may not, be harvested. A cover crop can be any type of plants, but are generally grasses (including cereal grains), legumes, or grass/legume mixtures. Some non-legume broad-leaved plants are also used.

Cover crops improve the physical, chemical, and biological quality of soil. They do this by covering the soil surface, penetrating the soil (roots), adding organic matter to the soil, and by being involved in the soil nutrient cycle. They can also help in managing insects and disease.

Cover crops reduce erosion and runoff by increasing infiltration. Cover crops, especially grasses, may also slow down runoff by physically blocking water flow. This gives the water more time to soak into the ground than would happen with bare ground. Cover crops also reduce soil water levels more than a bare soil would, leaving more room for water in the soil profile and decreasing runoff and erosion in the case where rainfall would saturate a bare soil.

Cover crops help suppress weeds. While the cover crop is growing, it will suppress the germination and growth of fall and early spring weeds through competition and shading. When killed and left on the surface as mulch, cover crops continue to suppress weeds, primarily by blocking out light.