



# AEM Tier II Worksheets

## Vegetables and Small Fruits

### Glossary

**Cover crop:** Grasses, legumes, small grains or other close-growing crops planted between regular crop production periods for the purpose of protecting and improving the soil.

**Action thresholds:** The level of pest infestation or damage at which some action must be taken to prevent an economic loss.

**WIN-PST (Windows Pest Screening Tool):** A pesticide environmental risk screening tool that NRCS field office conservationists, Soil and Water Conservation Districts, extension agents, crop consultants, pesticide dealers and producers can use to evaluate the potential for pesticides to move with water and eroded soil/organic matter and affect non-target organisms.

**Zone tillage:** A reduced tillage method that limits soil disturbance to the area of the planting row and leaves the areas between the crop rows undisturbed.

**Eutrophication:** The process of nutrient enrichment and basin-filling of a lake.

**Integrated Pest Management:** An ecologically-based pest control strategy designed to keep pest populations below economically injurious levels using a variety of control tactics.

### Background

Process and fresh-market vegetable and small fruit production occurs on approximately 145,000 acres in New York State and contributes nearly \$400 million to the state's economy. As with all types of farming, practices in the production process have the potential to impact nearby surface and ground water and other environmental resources. Primary pollutants that may come from farming practices may include nutrients, sediment, and pesticides.

Fertility and pest management practices should closely follow Cornell Guidelines for each specific and individual crop. Proper fertilizer application method, rate and timing will maximize crop uptake of nutrients and minimize nutrient loss to the environment. Nutrients in fertilizers can leach into groundwater or be carried away in runoff to surface water, degrading the water quality and wasting farm resources. Excess and improper timing of nitrogen fertilization can result in excess nitrate leaching to the ground water. Wells on the farm or in the neighborhood may develop elevated concentrations of nitrates, which has a detrimental impact to human and animal health. Phosphorus, which readily attaches to soil particles, can be transported to surface waters with soil erosion. The additional phosphorus load and increased sediment can result in algae blooms, eutrophication and a reduction in the quality of habitat for fish and other aquatic organisms.

Integrated Pest Management (IPM) strategies should be employed to identify alternative crop protection practices that help minimize or avoid pest problems, reduce or eliminate pesticide use and costs, and maximize potential profitability of crop production. When pesticides are used, they should be carefully selected and properly applied to reduce the potential of contaminating surface and groundwater.

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**Agricultural Water Quality Principle:** Practices that reduce the potential of nutrients, sediment and pesticides entering nearby waterbodies should be employed in the production of vegetables and small fruits.

## Glossary Continued...

**PSNT:** A soil test (widely used in field corn production) that determines how much nitrogen is available in the soil from degradation of organic matter and crop residues. PSNT is done before side dressing a crop to determine if and how much additional nitrogen is needed to make the crop.

**Acceptable Soil Loss:** An estimate of the maximum annual rate of soil erosion that can occur over a sustained period, without affecting crop productivity. The rate is expressed in tons (“T”) of soil loss per acre per year. Generally, rates of 1 to 5 are found, depending on soil properties. See the County Soil Survey for “T” factors for a specific soil type.

**Nutrient Management Plan:** Planned actions relative to the amount, source, placement, form and timing of the application of nutrients and soil amendments for the production of a crop. USDA Natural Resource Conservation Service Practice Standard 590 defines the criteria, considerations, specifications and operation and maintain of such plans.

**Water control structure:** A structure in a water management system that conveys water, controls the direction or rate of flow, maintains a desired water surface elevation or measures water.

**Tilth:** The physical condition of soil as related to its ease of tillage, fitness as a seedbed, and its impedance to seeding emergence and root penetration.

## Background continued...

The use of cover crops and crop rotation offers both environmental and production benefits. Such practices improves soil structure and tilth, supplies nutrients for the next crop, reduces the potential for runoff and erosion, reduces pressure from insect and weed pest and generally improves the productive capacity of fields.

In addition to this worksheet, several other core AEM worksheets will need to be completed for a full assessment of your farm’s environmental stewardship.

## AEM for Vegetables and Small Fruits

<b>Management Practices</b>	<b>Lower Risk.....1</b>	<b>2</b>	<b>3</b>	<b>Higher Risk.....4</b>
Is soil analysis done on a regular basis to determine the nutrient needs of your crops?	Soil analysis is done at least every other year, more often if problems arise. Results are used in planning fertilization, liming and organic matter amendments.	Soil analysis is done on fields every three years.	Soil analysis is done less than every three years and/or only in problem areas.	Soil analysis is not done.
How are nitrogen fertilizer rates determined?	Rates are based on soil tests, previous crops, cover crop plow down, manure/compost application and are consistent with Cornell Guidelines.	Rates are based on soil tests, previous crops, cover crop plow down and manure/compost application AND do not exceed 125% of Cornell Guidelines.		Rates are based on traditional practices and often exceed Cornell Guidelines.
Are PSNT tests used to determine N application rates where research is available?	PSNT is used to determine N application rates.	Sometimes use PSNT to determine application rates.	Seldom use PSNT to determine application rates.	Never use PSNT to determine application rates.
How are phosphorus application rates determined?	Phosphorus application rates are based on crop needs and soil test results and are consistent with Cornell Guidelines.	Phosphorus applications are based on crop needs only and do not exceed 125% of Cornell Guidelines.		Phosphorus applications are not based on crop needs or soil test results and often exceed Cornell Guidelines.

How often and why are cover crops used?	Cover crops are used annually on the majority of fields to capture residual N and reduce erosion.	Cover crops are used annually on over 50% of the fields to capture residual N and reduce erosion.	Cover crops are used annually on less than 50% of the fields to capture residual N and reduce erosion.	Cover crops are not used.
Is Crop rotation part of your management plan?	Management plan includes rotating crops to optimize pest and/or soil management AND meets acceptable soil loss for predominant soil type.	Management plan includes rotating crops to optimize pest and/or soil management.		Crops are not rotated. (Same crop is grown on the same field for more than 3 consecutive years).
How is crop rotation used on your farm?	Crop rotation is used and includes rotations of at least 3 years of hay crops or legumes.	Crop rotation is used and includes rotations of at least 1 or 2 years of hay crops or legumes.	Crop rotations are used but do not always include hay or legumes.	Crops are not rotated.
When is manure applied to fruit and vegetable fields?	Manure is applied and incorporated into the soil at least 120 days prior to harvest in accordance with a nutrient management plan OR composted manure is applied.		Manure is applied and incorporated into the soil at least 60 days prior to harvest.	Manure is applied and incorporated less than 60 days prior to harvest OR manure is top-dressed or side dressed to crop within 60 days of harvest. This includes animal bedding used as mulch.
Does your crop management plan use pest and disease resistant varieties?	If available, only pest and disease resistant varieties are used.	If available pest and disease resistant varieties are considered and given preference.	If available pest and disease resistant varieties are considered.	Pest and disease resistant varieties are not used.
Which threshold criteria do you use when making pest management decisions?	Scouting is done regularly. All available action thresholds are used when making pest control spray decisions.	Scouting is done regularly AND regional pest alerts are used.	Pest control sprays are applied when pests are present but threshold levels are not always considered.	Pest control sprays are applied on a regular schedule only.

Are non-chemical pest controls, such as cultural, biological, physical and mechanical, considered?	A combination of pest controls is used when available and when economically feasible to minimize environmental impact.		Some cultural, biological, and physical techniques are used for pest control.	Rely only on chemical pest controls.
What criteria are used for pesticide selection?	Pesticide selections are made with consideration of efficacy, environmental risk (assessed by a resource professional using WIN-PST), restricted re-entry interval, and preservation of the natural enemies of the specified pest and days to harvest.	Pesticide selections are made with consideration of efficacy, consultation with a trade professional on environmental risk, restricted re-entry interval, and preservation of the natural enemies of the specified pest and days to harvest.	Pesticide cost and efficacy are considered when making pesticide selections.	Only product cost is considered when making pesticide selections.

Additional Questions:

1. If zone tillage is used, how is nitrogen applied?
2. Are cover crops applied as soon as a crop is removed?
3. Is produce washed on the farm?  
If yes, complete the Process Wash Water Worksheet.
4. Has someone from your farm been trained in IPM or does the farm use a service employing IPM principles?
5. Do you utilize the NYS Elements of IPM (Integrated Pest Management) to assist with your pest management decision making? <http://nysipm.cornell.edu/elements/default.asp>

**NOTE:** You must also complete all applicable Core worksheets (e.g. irrigation water management, pesticide storage and use, soil management, etc)