
# Fruit Notes

*YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE*

Cornell Cooperative Extension
Lake Ontario Fruit Program

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## Is fall the best time to plant, or are there any problems or concerns to consider this year?

Mario Miranda Sazo and Terence Robinson

Fall planting is only a good strategy if it's done properly and at the right time, especially in a very wet and rainy fall like this year's. In general, fall-planted orchards have shown stronger growth in the first year compared to spring-planted trees. In addition, since fall-planted trees have also shown better blooming synchrony with older, established orchards, they are more likely to be protected from fire blight with streptomycin spray programs: new spring-planted trees bloom later than established orchards when temperatures are warmer, and hence are at higher risk of blossom blight if left unprotected or with fewer streptomycin sprays.

Fall planting can also be a good strategy to avoid planting delays in the spring due to unpredictable rainy weather conditions and/or late snow cover. Sometimes a grower can lose 30 or 40 days just waiting for the soil to dry out to the right moisture conditions when trying to plant early in the spring. Fall planting also allows early root establishment and maximum tree growth, which are critical for a new high density planting in the first year. But is fall really the best time to plant, or are there any problems or concerns to consider?

Successful fall planting requires a combination of conditions: (1) a well-prepared site with good drainage, good weed control and minimal rodent and deer populations; (2) mild weather and warm soil temperatures for several weeks after planting to encourage root establishment; (3) nursery trees that begin to enter dormancy early (including leaf drop); (4) a nursery supplier who is willing to fall-dig trees; (5) sufficient labor to plant trees quickly without them drying out, and (6) proper soil conditions to re-close the soil around the roots without leaving air pockets. The soil should flow when plowed or disked to allow the soil to settle around the roots as the tree planter passes. This last point is probably the most critical. There are some fall seasons in Western NY that are just too wet and proper soil conditions are never achieved after October 15th. It may be a costly mistake to "mud" trees in if the soil is too wet this year. This can lead to tree desiccation and death. In wet years, we recommend that the trees be left in the nursery or stored until the spring.

However, if you can satisfy the conditions listed above, the following practical tips can help you achieve successful fall planting:

1. Nursery trees need to experience cool temperatures and short day-lengths to encourage dormancy. Frost will promote leaf fall, and some nurserymen use copper sprays to encourage leaf abscission. If the trees are moved before dormancy, they could begin to grow again, which could predispose them to winter injury.

2. Once the trees show signs of dormancy, they can be dug and moved. Total leaf removal is necessary only if trees will be in storage for some time, to prevent diseases. It is critical to prevent the roots from drying out, especially as they may not be fully dormant. Use covering tarps and wet down any roots that seem dry.

3. The roots and soil need to be in intimate contact immediately after planting to ensure that the trees survive. Where a tree planter is used, the presser wheels need to be adjusted properly. Hand-planted trees should be tamped down firmly around the trunk. A follow-up watering is recommended if a soaking rain does not occur within a few days.

4. There is a risk of winter injury with fall planted apple trees—especially to the lower trunk and scaffold branches, because they are the last to harden-off fully. Mounding soil up to twenty inches around the trunk has an insulating effect against sudden freezes, and can be left to prevent insects from boring into the rootstock but should be removed in the spring to prevent scion rooting.

If all these precautions are followed, fall planting of apple trees can help your new orchard get off to a quick start next spring.

## Contents

# Spotted Lanternfly Update

Tess Grasswitz

Despite heroic efforts in Pennsylvania to quarantine and eradicate this species since it was first detected there in 2014, specimens of the spotted lanternfly (*Lycorma deliculata*)(adult shown left) have this year been found in several neighboring states, including Delaware, Virginia, New Jersey, New York and, most recently, Maryland.

In New York, in addition to the two individuals found in September in Albany and Yates counties, another live (and several dead) adults were recently found at a tree nursery in Suffolk County in a shipment originating from inside Pennsylvania's quarantine zone.

In response to these detections, the New York State Department of Agriculture and Markets, in collaboration with the Department of Environmental Conservation (DEC), has implemented a **quarantine order** that will impact the movement into New York of certain materials from Delaware, New Jersey, Pennsylvania, and Virginia. The regulated articles, including those listed below, now require certificates of inspection from the impacted states. The regulated materials include:

- All plants and plant parts, including, but not limited to nursery stock, green lumber, firewood, fruit, produce and other plant material living, dead, cut, fallen (including stumps), roots, branches, mulch, and composted or un-composted wood chips.
- Packing materials such as wooden boxes or crates.
- Landscaping, remodeling, or construction waste.
- Outdoor household articles, including, but not limited to, recreational vehicles, lawn tractors and mowers, mower decks, grills, grill and furniture covers, tarps, mobile homes, tile, stone, deck boards, mobile fire pits, and any equipment associated with these items.
- Trucks or vehicles not stored indoors.
- Any living stage of the spotted lanternfly.
- Any other article, commodity, item, or product that is, or that is reasonably believed to be, infested with or harboring spotted lanternfly.

The order also prohibits unnecessary stops while traveling through the quarantine area. Anyone that visits the infested areas of Pennsylvania, New Jersey, Delaware or Virginia should thoroughly inspect their vehicle, luggage, etc., for spotted lanternfly before leaving and scrape off any egg masses (at this time of year, both adults and egg masses may be found).

The New York Department of Agriculture and Markets will be making compliance checks at strategic locations around the state to enforce the new regulations. Extensive surveys for the insect will also continue in high-risk areas. Growers should familiarize themselves with the appearance of the different life stages of the insect and report any suspected sightings (with a photograph if possible) by e-mail to the DEC at spottedlanternfly@dec.ny.gov, noting the date, location, and host plant (if applicable).

## Biology of spotted lanternfly

### 1. Range and host plants

The native range of spotted lanternfly includes most of China, Taiwan and Vietnam, but it has also spread to Korea (2004), Japan (2009), and the USA (initially to Pennsylvania in 2014). In its native range, spotted lanternfly is found on more than 70 different woody plants and vines in 25 families, including apples, grapes, cherries, peaches, apricots, plums, hops, lilac, maple, poplar and birch. In Korea, it has become a severe pest of vineyards. However, its preferred host (particularly for egg-laying) is Tree of Heaven (*Ailanthus altissima*), which was introduced into North America as an exotic ornamental and which has subsequently become naturalized and invasive in some areas (in our region, it seems to be particularly common near waterways). Brown Marmorated Stink Bug (which also originated in Asia) also favors this host plant.

### 2. Damage

In spite of its common name, spotted lanternfly is not a fly at all, but a type of plant hopper. As such, both adults and nymphs feed by sucking phloem sap from their hosts, reducing plant vigor. Both adults and older nymphs tend to form dense aggregations (particularly late in the season) and trunks and branches may ooze sap at their feeding sites; eventually, branches of infested trees may wilt and die and young vines and hops may be killed.

Trees and vines weakened by intensive feeding (especially younger specimens) may be less able to withstand severe winter cold, or other subsequent stressors. In addition, as with many plant-sucking insects, more sugar is taken in than the insects can use, with the excess being excreted as sticky 'honeydew' that can cover leaves and fruits below the feeding sites. This honeydew can attract ants, bees, wasps and other insects (potentially interfering with harvest), and also supports the growth of black sooty mold. The latter can coat the leaves, reducing light penetration and thereby decreasing photosynthesis. The main effect of this insect is thus to reduce plant vigor by feeding, and by the

reduction of photosynthesis by this combination of honeydew and sooty mold. Grape growers have reported reductions in fruit yield and quality through these effects (last year one Pennsylvania grape grower reported a loss of approx. 90%), but to date this insect has not been reported to feed on the fruits of host plants. It is worth noting that many of our hedgerow and woodlot trees (including maples) are at risk from this insect; in Pennsylvania, black walnut seems to be particularly badly affected.

**3. Life-cycle and dispersion**

Spotted lanternfly overwinters in egg masses (discrete clumps—two shown in the picture below), which are laid from September to about late November on tree trunks and various other smooth, vertical surfaces (including non-living materials such as brick, stone, metal and plastic). In Pennsylvania, egg masses have been found on cars, trailers, shipping palettes, rusty barrels, outdoor grills, plastic yard furniture, and many other surfaces. Egg masses can be transported long distances on such objects (hence their inclusion in the NY quarantine order). It is thought that this insect first entered the USA in egg masses on a shipment of stone.

The egg masses are roughly 1–1½" long by ½-¾" wide and typically contain 30–50 eggs; they are grayish-brown in color, and are covered with a waxy coating that is initially shiny when the eggs are first laid, but becomes duller and more mud-like as it dries. After hatching (in spring), the individual eggs can be seen, typically arranged in 4-7 columns and looking like brown seeds.

When the eggs hatch, the nymphs (see pictures above right) move up the host tree; if winds blow them off the tree on which they hatch, they may climb other nearby vegetation. The nymphs grow and molt 4 times before they mature into adults from late July/August onwards; the adults are thought to survive for approximately 3 months. Large aggregations of this insect may occur from August onwards, and it is during this period when they are most likely to be seen in orchards and vineyards. Egg-laying has generally been reported to start in September (suggesting that a fairly long 'pre-oviposition period' is required before adult females are able to reproduce) and continues until the first killing frost. A Korean study estimated that overwintering eggs can withstand temperatures down to −12.72 °C (approx. 9 °F), but



reports from Pennsylvania suggest that the populations there may be more cold-tolerant than those in Korea.

**Management outlook**

For New York producers, the upside of the current situation is that growers and researchers in Pennsylvania have already had 4 years of experience with this pest and their work suggests that spotted lanternfly is probably much easier to control than Brown Marmorated Stink Bug [which tends to invade orchards at the same time of year (i.e., late summer)].

In experimental trials in Pennsylvania this year, a variety of insecticides from different chemical classes gave good initial knockdown. However, as with Brown Marmorated Stink Bug, the constant influx of new adults into treated areas from August onwards is a potential concern because of poor residual activity and long pre-harvest intervals for some products. Of the insecticides tested in Pennsylvania in 2018, Brigade 10WSB was one of the better ones. This product (and some other bifenthrin-based products) has carried a late-season FIFRA Section 18 exemption for Brown Marmorated Stink Bug in our region for the past 2 years.

For organic growers, tests conducted in PA in 2017 indicated that insecticidal soap had reasonably good contact action (although such products have no residual activity once dry). For small-scale organic growers, sticky bands placed around tree trunks at about 4 ft above ground level can catch substantial numbers of young nymphs if installed early enough in spring. In Korea, covering grapes prior to the late-season migration of adults into vineyards was effective at reducing damage but obviously increases production costs.

From a biological control perspective, it is encouraging that two native predatory insects have already been observed feeding on adult lanternflies in Pennsylvania: one is a predatory stink bug (*Apoecilus cynicus*), and the other is the wheel bug *Arilus cristatus* (so-called because it has a serrated, semi-circular 'wheel-like' structure just behind the head). Both species are generalist predators (i.e., will attack a variety of different prey insects) and both are associated with woodland or woodland edge habitats, where they are likely to encounter lanternflies

for much of the growing season. Both predator species are present in New York State.

Furthermore, two species of parasitic wasp have also been found attacking spotted lanternfly in Pennsylvania: a single specimen of an as-yet unidentified species recovered from a nymph, and another found parasitizing egg masses in much higher numbers. The latter species, *Ooencyrtus kuvanae*, is Asian in origin and was first introduced into the US in 1908 for control of gypsy moth; since then, it has been mass-reared and released several times and is now present in most of the areas where gypsy moth occurs—including here in New York. This rapid recruitment of natural enemies is good news, particularly as they are mainly woodland species: they are therefore likely to attack spotted lanternfly on some of its alternative tree hosts in areas where they will be (hopefully) somewhat protected from insecticides.

**Test your skill at spotting egg masses**

"Get your eye in" at the website below (maintained by a Pennsylvania landscape company) that has several pictures to help you detect egg masses on tree bark: https://spottedlanternfly.com/spot-the-egg-mass

**Photo credits**

Final instar nymph: Lawrence Barringer, Pennsylvania Department of Agriculture, Bugwood.org
All other pictures: Emelie Swackhamer, Penn State University, Bugwood.org

## Cornell introduces new on-line tool showing climate change by county

The **Cornell Institute for Climate Smart Solutions** (CICSS) has introduced a new on-line tool to show how climate has changed in each county from 1950 to 2013, as well as some predictions for future changes. This new tool, called **Climate Change in Your County**, includes data on average annual temperatures, high and low temperatures, growing season duration, annual growing degree days, and precipitation trends. The tool is part of Cornell's **Climate Smart Farming website**, which also houses other agricultural decision-support tools and resources to help farmers better cope with climate change.

The tool was developed by a team consisting of Art DeGaetano (Professor of climatology and Director of the Northeast Regional Climate Center at Cornell), Brian Belcher (Senior Developer at CICSS), Allison Chatrchyan, (Director of CICSS), Danielle Eiseman (Postdoctoral Associate), and Mike Hoffmann (Executive Director of CICSS). **Full link:** http://climatesmartfarming.org/tools/csf-county-climate-change/

## REMINDER! It's time to buy crop insurance for Apples, Grapes, Peaches & Tart Cherries

A reminder for New York growers of apples, grapes, peaches and tart cherries that the final date to apply for crop insurance coverage offered by the USDA's Risk Management Agency (RMA) for the 2019 crop year is November 20th. Current policyholders who wish to make changes to their existing policies, such as bringing a new member into the business or forming an LLC or a corporation, also have until November 20th to do so.

Federal crop insurance is critical to the farm safety net. It helps producers and owners manage revenue risks and strengthens the rural economy. Coverage for apples, grapes, peaches, and tart cherries is available in select counties. Additional information can be found on the Actuarial Information Browser page (https://webapp.rma.usda.gov/apps/actuarialinformationbrowser2018/CropCriteria.aspx) of the RMA website.

Growers are encouraged to visit their crop insurance agent soon to learn specific details for the 2019 crop year, including insurance for apples, grapes, and peaches, which may be eligible for coverage under a written agreement. Crop insurance coverage decisions must be made on or before the sales closing date. Growers should contact their crop insurance agent well in advance of this date.

Crop insurance is sold and delivered solely through private crop insurance agents. A list of crop insurance agents is available at all USDA Service Centers and online at the RMA Agent Locator (https://www.rma.usda.gov/tools/agent.html). Producers can use the RMA Cost Estimator (https://ewebapp.rma.usda.gov/apps/costestimator/) to get an on-line premium estimate for their insurance needs.

For perennial crops, November 20th is also the deadline to apply for Whole-Farm Revenue Protection (WFRP) (https://www.rma.usda.gov/Fact-Sheets/National-Fact-Sheets/Whole-Farm-Revenue-Protection-2018) and Supplemental Coverage Option (SCO) (https://www.rma.usda.gov/Fact-Sheets/National-Fact-Sheets/Supplemental-Coverage-Option-2017). For more information about crop insurance and the modern farm safety net, visit www.rma.usda.gov.

# Supplemental Coverage Option for Apples – Should you add this endorsement to your apple crop insurance policy?

Elizabeth Higgins (Ag. Business Management Specialist, Eastern NY Commercial Horticulture Team)

Apple growers in New York are starting to see a new crop insurance option in some counties: the Supplemental Coverage Option (SCO). Now that we are nearing time to sign up for crop insurance again, let's dig a little deeper – what is SCO and why might you consider it?

The supplemental coverage option (SCO) is an endorsement that you can add to your underlying apple crop insurance policy (APH). It provides additional coverage that is based on an event's *regional* impacts to yield. Your primary apple policy pays if you suffer an insurable loss on your farm based on your policy coverage and your losses. SCO pays if the regional yield, calculated as the weighted average of policyholder yields reported to RMA in a region, falls below 86% of the expected regional yield due to an insurable event, regardless of what happens to yields on your farm. Insurable events typically include natural disasters or weather, such as flood or drought or pest infestation, that lead to lower yields or quality even when good management practices are used.

*Figure 1: Counties with SCO available, non-irrigated apples*

| | Indemnity Payment Received | |
|---|---|---|
| **Impact to Individual Yield above insured level** | **Yes APH**<br>**No SCO** | **Yes APH**<br>**Yes SCO** |
| **Impact to Individual Yield below insured level** | **No APH**<br>**No SCO** | **No APH**<br>**Yes SCO** |
| | **Regional Yield at or above 86% of expected yield** | **Regional Yield below 86% of expected yield** |

***Table 1: Payment Triggers SCO vs APH Apples***

As an example, if a hail storm hits most of the farms in your region, but the damage on your farm was not high enough to trigger an indemnity payment, you would not receive an insurance payment. BUT if you had purchased the SCO endorsement, and the hail damage in your region resulted in regional yields below 86% of the area expected yield, you would receive an insurance payment, even though you personally did not have an insurance-triggering loss. In a nutshell, as you can see in Table 1, it is possible, with an SCO policy, to suffer an individual loss, but not receive an SCO payment or vice-versa.

So how do you know if the SCO makes sense for your farm? In general, the degree to which your yields and yield risk match those of the SCO area is a key consideration when deciding whether to purchase an SCO endorsement. The greater the difference between your farm's yield volatility and the SCO area's yield volatility, the less likely an SCO payment will be triggered when you experience a yield loss. The size or homogeneity of the region could also have an impact. A smaller region is more likely to have an event that would result in a regional yield or revenue impact than a very large region. The size of the SCO region can vary from a single county to multiple counties. For example, Ulster County's region for fresh market, irrigated apples is just Ulster County, but Washington County's region is 18 counties in New York, Massachusetts and Vermont[1].

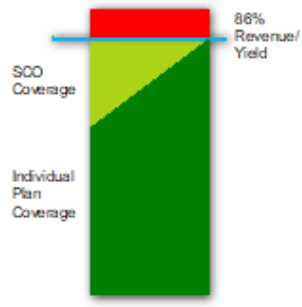


*Figure 2: SCO coverage, in conjunction with APH coverage*

How much does SCO coverage cost? If you have purchased less underlying insurance coverage, the SCO coverage would cost more, but provide more protection. If you have purchased more coverage, then the SCO coverage costs less but provides less additional protection. Figure 2 shows how the two programs work together. Also,

like APH insurance, SCO coverage is subsidized by the federal government, so farmers only pay 35% of the actuarial cost of the coverage.

Let's look at some scenarios that show how adding the SCO endorsement could impact a grower in 2 regions in Eastern New York, Ulster and Washington Counties (assume the farms have the same historic yields):

2018 Ulster Irrigated Fresh Market Apples, 100 acres

- Approved Yield: 658 bu/ac
- Projected price $13.30/bu
- Expected Area Yield 769.1 for SCO – region only includes Ulster County. 86% threshold is 661.4 bu/ac

| APH Coverage Level Percent | 75% | 70% | 65% | 60% | 55% | 50% |
|---|---|---|---|---|---|---|
| Additional SCO coverage Percent | 11% | 16% | 21% | 26% | 31% | 36% |
| APH Policy, Producer Premium | $41,315 | $30,442 | $24,255 | $17,673 | $14,435 | $10,602 |
| APH Yield Guarantee bu/ac | 493.5 | 460.6 | 427.7 | 394.8 | 361.9 | 329 |
| SCO Endorsement, Producer Premium | $6,998 | $8,694 | $9,745 | $10,432 | $10,824 | $11,303 |
| SCO Regional Yield Guarantee (86%) bu/ac | 661.4 | 661.4 | 661.4 | 661.4 | 661.4 | 661.4 |
| **Total Premium** | **$48,313** | **$39,136** | **$34,000** | **$28,105** | **$25,259** | **$21,905** |

2018 Washington Irrigated Fresh Market Apples, 100 acres

- Approved Yield 658 bu/ac
- Price $13.30/bu
- Expected Area Yield 785.4 – includes 18 counties in NY, MA and VT[1]. 86% threshold is 675.4 bu/ac

| APH Coverage Level Percent | 75% | 70% | 65% | 60% | 55% | 50% |
|---|---|---|---|---|---|---|
| Additional SCO Coverage Percent | 11% | 16% | 21% | 26% | 31% | 36% |
| APH Policy, Producer Premium | $52,101 | $46,060 | $30,786 | $22,507 | $18,481 | $13,666 |
| APH Yield Guarantee bu/ac | 493.5 | 460.6 | 427.7 | 394.8 | 361.9 | 329 |
| SCO Endorsement, Producer Premium | $7,776 | $9,850 | $11,218 | $12,137 | $12,733 | $13,078 |
| SCO Regional Yield Guarantee (86%) bu/ac | 675.4 | 675.4 | 675.4 | 675.4 | 675.4 | 675.4 |
| **Total Premium** | **$59,877** | **$55,910** | **$42,004** | **$34,644** | **$31,214** | **$26,744** |

**Scenario 1**: A very significant and widespread frost event results in a 51% reduction in yield on the farm, so all levels of APH insurance pay. The regional average yield after this event also declines by 51%. In this example, where the regional yields also had the same level of decline as the farm yield, you can see that having higher SCO coverage and lower APH coverage provided a higher payment.

***Scenario 1, widespread damage***

| | | | | | | Indemnity Payment at Level of APH Coverage | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Acres | App. Yield | Act. Yield | Price | Exp. Return | 75% | 70% | 65% | 60% | 55% | 50% |
| **Ulster APH** | 100 | 658 | 322.4 | $13.30 | $ 875,140 | $227,536 | $183,779 | $140,022 | $ 96,265 | $ 52,508 | $ 8,751 |
| **Washington APH** | 100 | 658 | 322.4 | $13.30 | $ 875,140 | $227,536 | $183,779 | $140,022 | $ 96,265 | $ 52,508 | $ 8,751 |
| **Ulster SCO** | 100 | 769.1 | 376.9 | $13.30 | $ 1,022,903 | $112,519 | $163,664 | $214,810 | $265,955 | $317,100 | $368,245 |
| **Washington SCO** | 100 | 785.4 | 384.8 | $13.30 | $ 1,044,582 | $114,904 | $167,133 | $219,362 | $271,591 | $323,820 | $376,050 |
| | | | | | | | | | | | |
| **Ulster Payout (indemnity - Premium Paid)** | | | | | | $291,743 | $308,308 | $320,832 | $334,115 | $344,349 | $355,091 |
| **Washington Payout (Indemnity - Premium Paid)** | | | | | | $282,563 | $302,553 | $317,381 | $333,213 | $345,115 | $358,057 |

**Scenario 2:** A less significant frost results in a 20% reduction in yield on your farm and regionally. You do not have enough of a loss to receive APH payments at any level of coverage, but you do receive a benefit from SCO for the difference between

[1] Berkshire, MA, Franklin, MA, Albany, NY, Clinton, NY, Columbia, NY, Essex, NY, Fulton, NY, Rensselaer, NY, Saratoga, NY, Ulster, NY, Washington, NY, Addison, VT, Bennington, VT, Chittenden, VT, Grand Isle, VT, Rutland, VT, Windham, VT, Windsor, VT

86% and 80% yields. In this example, where there is widespread damage, but the level of damage on the individual farm is not high enough to result in a crop insurance payment, the SCO endorsement resulted in indemnities but not APH at any level.

***Scenario 2, widespread minor damage***

| | | | | | | Indemnity Payment at Level of APH Coverage | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Acres | App. Yield | Act. Yield | Price | Exp. Return | 75% | 70% | 65% | 60% | 55% | 50% |
| **Ulster APH** | 100 | 658 | 526.4 | $13.30 | $ 875,140 | $ - | $ - | $ - | $ - | $ - | $ - |
| **Washington APH** | 100 | 658 | 526.4 | $13.30 | $ 875,140 | $ - | $ - | $ - | $ - | $ - | $ - |
| **Ulster SCO** | 100 | 769.1 | 615.3 | $13.30 | $ 1,022,903 | $ 61,374 | $ 61,374 | $ 61,374 | $ 61,374 | $ 61,374 | $ 61,374 |
| **Washington SCO** | 100 | 785.4 | 628.3 | $13.30 | $ 1,044,582 | $ 62,675 | $ 62,675 | $ 62,675 | $ 62,675 | $ 62,675 | $ 62,675 |
| | | | | | | | | | | | |
| **Ulster Payout (indemnity - Premium Paid)** | | | | | | $13,061 | $22,238 | $27,374 | $33,269 | $36,115 | $39,469 |
| **Washington Payout (Indemnity - Premium Paid)** | | | | | | $2,798 | $14,315 | $20,671 | $28,031 | $31,461 | $35,931 |

**Scenario 3**: A hailstorm affects your farm, resulting in a 35% reduction in yield. The level of damage regionally was not enough to cause regional yields to fall below 86% of expected yield, so there is no SCO payment. In this example, you can see that for more localized events, indemnities are more likely to be triggered at higher levels of APH coverage. These types of events are also what may make SCO endorsements less likely to pay out in counties where the region is very large.

***Scenario 3, localized damage***

| | | | | | | Indemnity Payment at Level of APH Coverage | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Acres | App. Yield | Act. Yield | Price | Exp. Return | 75% | 70% | 65% | 60% | 55% | 50% |
| **Ulster APH** | 100 | 658 | 427.7 | $13.30 | $ 875,140 | $ 87,514 | $ 43,757 | $ - | $ - | $ - | $ - |
| **Washington APH** | 100 | 658 | 427.7 | $13.30 | $ 875,140 | $ 87,514 | $ 43,757 | $ - | $ - | $ - | $ - |
| **Ulster SCO** | 100 | 769.1 | 769.1 | $13.30 | $ 1,022,903 | $ - | $ - | $ - | $ - | $ - | $ - |
| **Washington SCO** | 100 | 785.4 | 785.4 | $13.30 | $ 1,044,582 | $ - | $ - | $ - | $ - | $ - | $ - |
| | | | | | | | | | | | |
| **Ulster Payout (Indemnity - Premium Paid)** | | | | | | $39,201 | $4,621 | ($34,000) | ($28,105) | ($25,259) | ($21,905) |
| **Washington Payout (Indemnity - Premium Paid)** | | | | | | $27,637 | ($4,603) | ($42,004) | ($34,644) | ($31,214) | ($26,744) |

So, should you consider adding the SCO endorsement? Like any farm management decision, it depends.

- SCO would provide more protection for your farm business if insurable events that are likely to impact your farm are as likely, or are more likely, to also affect other producers in your region.
- Due to the higher coverage level than APH, SCO may help you increase the number of scenarios under which you would be likely to receive a benefit.
- Using SCO with lower levels of APH may decrease your premium, but in exchange you are less likely to receive an indemnity for insurable events that occur on your farm but not in your region.
- **A key consideration is whether you have enough coverage to get your business back on its feet after an insurable event, at an annual cost that is affordable to your business.**

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## Why apply nutrients in the fall?

Bernardita Sallato, Washington State University

Plants need light, carbon dioxide ($CO_2$), water ($H_2O$), and minerals for their development, growth, and for producing quality fruit (Marschner 2002). Most nutrient uptake occurs through the roots, between bloom and the rapid vegetative growth phase. In most perennial tree fruits, however, initial spring growth and early fruit development rely mainly on reserves accumulated the previous season (Weinbaum et al. 1984). There is evidence that fall applications of nutrients can help in building up reserves for the subsequent year´s critical early growth (Nielsen et al. 1996; Lang 2005).

The macronutrients nitrogen (N), potassium (K), phosphorous (P), calcium (Ca), magnesium (Mg) and sulfur (S), should always be managed through the soil, unless there are absorption problems such as poor root volume or alkalinity. Micronutrients, on the other hand, can be managed effectively and efficiently with foliar sprays, especially under conditions of low or high soil pH (below 6.0 and above 7.5), in coarse-textured soils (sandy or gravely soils), and/or if needed early in the season when root uptake is low. However, although foliar applications of micronutrients are effective, keeping their level in the soil at adequate levels is always beneficial for root growth and tree health.

Fall nutrient sprays can be utilized for different purposes: to ensure adequate reserves for the following season, to manage vigor and return bloom, or to contribute to disease management. Hence it is important to define your goal before deciding whether or not to spray nutrients. A few things to consider include the following:

**Fall sprays to build reserves and overall nutrient management**

Fall sprays are recommended for nutrients that are mobile in the plant and can be stored for the following season, or nutrients that are needed early in the spring when root uptake is not efficient (Fageria et al. 2009). Fall sprays will be beneficial and effective only if the trees are deficient in that particular nutrient. Under adequate nutrient conditions, foliar sprays are ineffective (Wojcik and Morgas 2013) and may also lead to toxicity.

**Nitrogen** is the only macronutrient that has been recommended for fall sprays because it can be stored and re-mobilized during early development. Nitrogen and carbohydrate reserves are the main resource for initial growth and early fruit development in most tree fruit species, particularly those that have short and early development, or in which pollination occurs before leaves are fully expanded (e.g. cherries, apricots, peaches, nectarines, apples and pears) (Nielsen et al. 1996; Lang, 2005).

Leaf tissue analyses obtained during the summer, combined with assessment of overall tree vigor, are the best indicators for nitrogen deficiency (Righetti et al. 1998). Fall nitrogen sprays have also been suggested when trees have cropped heavily and appear weak after harvest.

**Micronutrients.** Among the micronutrients, boron (B) and zinc (Zn) are those most frequently recommended for fall application. Deficiencies of both nutrients have been widely reported in the Pacific Northwest due to extensive areas with high soil pH and sandy soils (Nielsen et al. 2004; Peryea et al. 2003). Boron is needed early in the season for new growth, for root and shoot tips, for pollen tube growth, fruit set (Wojcik and Wojcik 2006), and for early fruit development and quality (Cheng and Raba 2009). When it is deficient, fall applications can increase boron content for early spring growth. However, Peryea et al. (2003) reported that boron maintenance sprays in apples and pears are more effective at pink and mentioned that post-harvest sprays have not been widely adopted in apples due to problems with logistics and efficacy at later harvest dates.

Zinc also has low mobility in plants and is needed early in the season for carbohydrate metabolism, fertility and seed production. Deficiency can be easily observed in younger leaves in the form of interveinal chlorosis and shortened internodes (seen most frequently in cold, wet soils, or in soil with a high pH (above 7.5), where zinc becomes unavailable). Fall and dormant sprays have alleviated zinc deficiencies in tree fruit (Nielsen and Nielsen 1994). For leaf nutrient sprays, mixing micronutrients with urea has improved uptake (Fernandez et al. 2013; Sanchez and Righetti 2005).

There are several formulations for each nutrient: the most common are listed in Table 1. Whatever the source, always check the label recommendation. To calculate the amount of product based on the actual amount needed, divide the actual amount recommended by the percentage of the element indicated in the label. **Example: Urea (46% of N). If you need to apply 8 lbs/acre, then 8/(46%) = 17 lbs of urea.**

**Table 1. General fall recommendations for tree fruit under diagnosed deficiency.**

| Nutrient | Formulation or Salt | Dose[1] |
|---|---|---|
| Boron | Sodium borate | 1 to 1.6 lb of B |
| Zinc | Zinc sulfate | 8–10 lb of Zn for apples and cherries.<br>3 lb of Zn for peach and nectarine.<br>For non-bearing trees apply 0.5 lb |
| Nitrogen | Urea | 8–10 lbs of N. When using urea, make sure it has less than 0.25% biuret. |

[1]Pounds of actual element in 100 gallons of water per acre.

To ensure absorption and mobilization to the roots while minimizing the danger of promoting new growth (and hence increasing the risk of winter freeze damage) (Righetti et al. 1998), fall nutrient sprays should be applied when growth has ceased but before natural leaf fall (green leaf).

**Fall sprays to manage vigor and return bloom**

If you have excess vigor in your orchard, avoid applying nitrogen during the fall. On the other hand, if you need more vigor in your orchard, fall nitrogen can help develop reserves. Nitrogen deficiency has also been associated with inducing biennial bearing; if your trees are in their "off" year and you expect higher cropping the following year, fall nitrogen can help correct the relationship between vegetative and fruit growth (and vice versa: when expecting a low crop, avoid fall nitrogen).

**For disease prevention**

Some fall nutrient sprays can help prevent fungal diseases. Copper, for example, is utilized as a fungicide although its application can also help if copper is deficient. Fall sprays of urea have also been used to induce leaf drop. The concentration should be higher than that used as a fertilizer. For example, urea at 5% has been used to reduce the inoculum of *Venturia inaequalis* (responsible for apple scab) (Qazi et al. 2005).

The action of high rates of urea—in some cases also combined with zinc sulfate—seems to be associated more with a toxic effect, which induces leaf drop earlier in the season, before cold or rain can increase the probability of infection through the leaf scar. Ouzounis and Lang (2005) also indicated that urea sprays for early defoliation improved cold acclimation in cherries.

**Summary**

- Fall sprays are beneficial and effective only when the trees are deficient in that particular nutrient.
- Fall nitrogen applications can help in building up reserves for the subsequent year´s critical early growth.
- Fall zinc and boron spray can benefit reproduction and early fruit development.
- Fall sprays should be applied when growth has ceased but before natural leaf fall.

(Please note that some pictures and a few soil pH comments related to Washington growing conditions were deleted from this article. They entire article can be found on-line at: http://treefruit.wsu.edu/article/fall-nutrient-management-tree-fruit/
).

## Educational Opportunities: Native Pollinator Conservation and Enhancement on Your Farm

A wealth of opportunities are available for those wanting to learn how to improve farm habitat to benefit native bees and other pollinators. Better yet, some of these practices are eligible for financial support through programs run by the Natural Resources Conservation Service (NRCS).

For many years, the Xerces Society for Invertebrate Conservation has partnered with the NRCS to help promote these programs and practices to growers through workshops, webinars and printed materials. Two such one-day workshops are being offered in our region this November and December, and there are also several on-line webinars available for viewing whenever you have an hour or so to spare.

**WORKSHOPS**

**1. Pollinator Conservation Short Course**. Iroquois National Wildlife Refuge, Basom, NY. Wednesday November 7th, 9:30 AM–3:00 PM. Full details and registration available on-line at: http://events.r20.constantcontact.com/register/event?llr=tnjebhdab&oeidk=a07efrckbnufc76e12a&condition=SO_OVERRIDE or contact Liz Robertson at the Xerces Society (E-mail: liz.robertson@xerces.org or (855) 232-6639 Ext. 120)

**2. Pollinator Conservation Short Course.** CCE Wayne County. Thursday December 6th, 9:30 AM–3:00 PM. Registration and details not yet available, but program likely to be very similar to Workshop 1 (below left).

**3. An additional "hands-on" field-based event** is planned for spring, 2019 to complement these two events. Details will be announced when available.

**RECORDED WEBINARS**

**Science and Technology Training Library Webinar Portal**: This site houses a collection of on-demand (recorded) webinars on a wide variety of topics related to agriculture and natural resource management. Webinar topics are searchable by keyword: searching for 'pollinators' will produce an extensive list, including the two listed below. Please see: http://www.conservationwebinars.net/previous-webinars

**1. Farming for Bees: Conservation of Native Pollinators**. How to plan, create, manage, and protect habitat for native pollinators. Run time: 1.5 hours. Available on-line at:

http://www.conservationwebinars.net/webinars/farming-for-bees

**2. Role of Agroforestry in Supporting Pollinators**. Many agroforestry practices can be adapted for use on fruit farms and with correct design and planning can provide both habitat for pollinators and other environmental benefits (e.g. reduction of spray drift onto sensitive areas). Practices such as planting windbreaks (including shelterbelts, hedgerows, living snow fences) and riparian forest buffers may also be eligible for NRCS support payments. Run time: 1 hour. Available on-line at: http://www.conservationwebinars.net/webinars/role-of-agroforestry-in-supporting-pollinators

## The Master Class for Bilingual Crew Members – Class Enrollment is Full and Set to Begin!

Leadership and communication training: a course for bilingual orchard crew members

Enrollment for *The Master Class*—a professional development and communication training course for bilingual orchard crew members hosted by Cornell's Labor Ready Farmer project—is now full and the series of seven classes will run from now until December. The course is designed for Spanish-speaking middle managers with the overall goal of enhancing their leadership and management skills, as well as their English-language proficiency. Topics covered will include on-farm communication, conflict resolution, people management, business impact, team leadership and workplace culture. Agriculture-specific English-language and communication lessons will be presented through real-life work scenarios.

For farm owners, making such investments in developing the skill-sets of key employees paves the way for the long-term retention of those individuals most committed to the ultimate success of the business; it can also help increase on-farm efficiency and save money. Providing benefits to growers is an essential component of the Labor Ready Farmer project, and as such, farm owners are encouraged to play an integral role in the program by helping to shape training outcomes and by providing feedback throughout the course.

We thank the following farms for nominating participants in this course:

- Bittner-Singer Orchards
- Hurd Orchards
- Kirby's Farm Market
- Ledge Rock Farms, LLC.
- Morgan Farms
- Orchard Dale Fruit Co., LLC
- Perez Farm
- Rosario Farm
- Russell Farm
- Sandy Knoll Farms Inc.
- Teeple Farm

The Cornell Small Farms Program and Lake Ontario Fruit Program are excited to launch this professional development course in Western New York! We value feedback and program evaluation from growers and participants alike. Although enrollment is now full, please contact the project team (below) if you are interested in future training opportunities or have general questions:

- Dr. Anu Rangarajan, Director, Cornell Small Farms Program: ar47@cornell.edu
- Mario Miranda Sazo, Cornell Cooperative Extension Lake Ontario Fruit Program: mrm67@cornell.edu
- Nicole Waters, Beginning Farmer Project Coordinator, Cornell Small Farms Program: nw42@cornell.edu

## Grant opportunities for Growers

**1. Northeast SARE Farmer Grants**

Northeast SARE offers grants to farmers to conduct research on issues that affect farming and the food system in the Northeast. Competitive proposals should seek to test a new idea, or apply a known idea in a new way; successful projects are those that are well-designed and which promise the greatest benefits to the farming community. Application instructions and additional materials are available on-line at: https://www.nesare.org/Grants/Get-a-Grant/Farmer-Grant. For questions, contact Carol Delaney at Carol.Delaney@uvm.edu**. Deadline for applications is November 27th, 2018.**

**2. Pro*Act Cultivating Change Grants**

The Pro*Act network of produce distributors has $85,000 in grants available to eligible growers through its 'Cultivating Change' program, started in 2015 as part of the company's sustainability initiative, Greener Fields Together. Applications are being accepted through **December 15th, 2018**. A panel of industry professionals will review the proposals, and the general public can also vote on their favorites. The winners will be announced Feb. 4th, 2019. For more information, visit the Cultivating Change website (Full link: https://cultivatingchange.org/) or contact Mackenzie Lovelace of Pro*Act at (831)-658-1963.

**3. New York State New Farmers Grant Fund**

Empire State Development (ESD) and the New York State Department of Agriculture and Markets has announced $1 million in funding to assist early-stage farmers through the New York State New Farmers Grant Fund. The program, now in its fifth year, promotes growth and development in the state's agriculture industry.

The New Farmers Grant Fund will provide grants of up to $50,000 to assist with up to 50% of eligible project costs. To qualify, all farm business owners must be within the first ten years of having an ownership interest in any farm business, and the farm must have a minimum of $10,000 in income from sales of products grown or raised on the farm. Eligible project costs include the purchase of machinery, equipment, supplies, and the construction or improvement of agricultural structures.

Applications and guidelines for the New Farmers Grant Fund are available online at: https://esd.ny.gov/new-farmers-grant-fund-program. The **deadline for submission is January 25th, 2019**. Further resources to help new and beginning farmers is available at the Department of Agriculture & Markets' New and Beginning Farmer 'One Stop Shop' available online at: https://www.agriculture.ny.gov/AP/BegFarmers/NewFarmersResources.html

## Mark Your Calendars

| Meeting Title | **2019 Empire Producers Expo** |
|---|---|
| Dates | January 15th–17th, 2019 (Becker Forum on Labor is on January 14th, 2019 at the Holiday Inn-Liverpool) |
| Time | All Day |
| Location | SRC Arena & Events Center, Onondaga Community College |
| Cost | Varied, see website |
| Brief description of | Annual statewide educational meeting for the commercial fruit & |
| Registration/Contact | See website at : http://nysvga.org/expo/information/ |

| Meeting Title | **2019 LOF Winter Fruit Schools** |
|---|---|
| Dates | February 4th & 5th, 2019 |
| Time | All Day |
| Location | Monday, Feb. 4th at CCE Niagara, Lockport; Tuesday, Feb. 5th Wayne county, venue TBA |
| Cost | TBA, stay tuned to our website. |
| Brief description of meeting | Annual educational meetings for commercial tree fruit and small fruit growers in WNY |
| Registration/Contact information | See website in January at: https://lof.cce.cornell.edu/ |

Cornell Cooperative Extension
Lake Ontario Fruit Program
12690 Rt. 31
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# Fruit Notes

***YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE***

## Fruit Specialists

Craig Kahlke I 585-735-5448 I cjk37@cornell.edu
**Team Leader, Fruit Quality Management**

**Areas of Interest**: Fruit Quality and factors that affect fruit quality before, during, and after storage,

Mario Miranda Sazo I 315-719-1318 I mrm67@cornell.edu
**Cultural Practices**

**Crops**: Blueberries, Raspberries / Blackberries, Strawberries, Apples, Apricots, Asian Pears, Cherries, Currants, Gooseberries, Nectarines, Peaches, Pears, Plums

Tessa Grasswitz I 585-261-0125 I tg359@cornell.edu
**Integrated Pest Management (IPM)**

**Areas of Interest**: IPM of tree fruit and berry pests, biological control, pollinators, and impact of climate change.
**Crops**: Blueberries, Raspberries / Blackberries, Strawberries, Apples, Apricots, Asian Pears, Cherries, Currants, Gooseberries, Nectarines, Peaches, Pears, Plum

Mark Wiltberger I 315-272-8530 I mw883@cornell.edu
**Business Management**

**Crops: Apples, Cherries, Nectarines, Peaches, Pears, Plums**

**For more information about our program visit us at lof.cce.cornell.edu**