



# New York Berry News

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honey bees and pollination by another new author, Nick Calderone from the Dyce Laboratory of Honey Bee Studies at Cornell, and an article on pricing products to survive rising energy costs by one of our most frequent contributors, Wen-Fei Uva. Also included in this issue are the first weekly weather reports/summaries for the 2006 season.

## UPCOMING MEETINGS

**May 6-9, 2006** - United Fresh Fruit and Vegetable Association Produce Expo and Convention, McCormick Place, Chicago, (202) 303-3400, <http://www.uffva.org>.

**May 18-20, 2006** - Texas-Mexico Frozen Food Fiesta Marriott Casa Magna, Puerto Vallarta, Mexico <http://www.affi.com/frozenfoodfiesta>.

**June 19-30, 2006**- Post-Harvest Technology Short Course, University of California, Davis, Calif. (530) 752-6941.

**August 22-23, 2006**- North American Strawberry Growers Summer Tour, Portland Maine. For more information: <http://www.nasga.org>.

**October 6-7, 2006**- U.S. Highbush Blueberry Council Fall Meeting, Regency, Bar Harbor, Maine. For more information: 207-288-9723.



**A**ction-packed would be a good description for this month's issue, which contains lots of information on those things you need to spring into action on as the small fruit season gets off to an early start compared to last year.

Our April issue includes a local viewpoint on temporary labor by Steven McKay. News briefs include timely seasonal reminders, an article on small scale fruit and vegetable production by a new contributing author, Richard Gast of Franklin County CCE (welcome aboard, Richard!), a new law and regulations concerning ammonium nitrate fertilizer, and the launch of a new web site dealing with climate changes and agriculture in the Northeast.

Our in-depth articles this month are from several sources. We are featuring 2 more select articles from the NABGA 2006 Conference Proceedings (some of which originated from the berry sessions at our Empire State Fruit and Vegetable Expo) which deal with raspberry arthropod pests and diseases, an in-depth article on

# TEMPORARY WORKERS FOR AGRICULTURE AND OTHER INDUSTRIES

*Steven McKay, Extension Educator, Hudson Valley Commercial Fruit Program, Cornell Cooperative Extension of Columbia County, Hudson, NY 12534*

**W**ith much debate brewing about immigration issues I feel that it's important to take some time and review the need that agriculture and other industries have for temporary foreign workers. These are workers who come to the US for a limited amount of time to take a seasonal or other temporary job, and then return to their country of origin. Many people confuse these workers with aliens who come to the US looking for permanent residency or citizenship. Aliens with both goals show up in the US by entering both with legal and illegal means. In this article, I'd like to further discuss the definition of temporary jobs, types of temporary jobs that exist, why it's difficult to find local help, benefits of a temporary labor program, and how a temporary worker program might be looked at as a form of foreign aide.

Temporary jobs are those jobs that generally last less than a year. Seasonality and temporary projects qualify jobs as temporary. Agricultural jobs including production and processing generally correspond to the growing season, and they are eliminated during the off-season. Jobs at winter sports areas and summer tourist resorts are also seasonal with "on and off" times. Construction and landscape jobs generally take place from spring to fall, and are thus seasonal. An example of a temporary project could be a contract that a company receives to produce a set quantity of goods on a one-time basis. Skilled jobs can also qualify as temporary if local skilled personnel are not available, and there is a need to be filled (e.g. nurses, teachers, and computer/IT workers). The classification used by the United States Citizen and Immigrant Services (USCIS) is H1 for skilled, and H2 for unskilled workers.

It's hard to find American workers for these jobs for a number of reasons. First, the jobs are temporary, and most Americans would like a permanent, secure job. The jobs are often in locations away from where potential American workers live, and the American workers are not willing to move to where the job is. Also, the low pay, and menial work that's often required is an undesirable characteristic of the jobs. At the same time, the job could be very attractive for a foreign worker since the rate of pay would be better than that found in the foreign country, or work may be unavailable in that country.

Temporary workers come to the US looking for employment or a better paying job to improve living conditions at home, or finance a business that they want to start at home. They want to return home because their families are there, and they prefer the culture and lifestyle. They spend as little money as possible here so that they can send money home, and return home as soon as possible. However, they pay required income, sales, and property taxes in the US. If they are here illegally, they will probably have false identification cards, and the income taxes they pay are never refunded since social security cards don't correspond to their name. They pay social security taxes to accounts with false numbers with no possibility of benefits from the payments in the future. These taxes are a benefit to American citizens.

A temporary labor program is beneficial to the immigration system. Having a system that is easy to use, and is without artificial limits will help to prevent illegal border crossings. Workers are documented and their movement is monitored. A temporary labor program also benefits the economy. Many industries would go out of business if they did not have temporary alien workers, and a temporary program should be designed to fulfill those needs. The money being sent home could also be viewed as a form of foreign aide that has been earned. It seems much better to offer jobs to foreigners so that they can earn money and help our economy, while sending money home to help their own economy and invest in new businesses.

Americans should remember that temporary workers are not immigrants looking for citizenship. They are just looking for temporary jobs to benefit their lives in their home country. The presence of these workers benefits our economy by providing workers and paying taxes. The salaries are also a sort of earned foreign aide that goes to improving conditions in their home country.

# SEASONAL REMINDERS AND UPDATES

*Dena Fiacchino, Tree Fruit and Small Fruit Extension Educator, Cornell Cooperative Extension, Oswego County, Mexico, NY*

## Strawberries:

**Remember last spring? Consider frost protection now to reduce the chances of frost injury.**

- As the temperatures vary at night, be sure to investigate overhead irrigation for frost protection. We are not close to flowering, but it makes more sense to be prepared than caught off guard.
- Strawberry flowers can experience frost injury at temperatures less than 28°F. When temperatures begin to drop, flowers should be protected with irrigation. When water is applied at 32°F it freezes and gives off heat. The flowers are actually protected from any further drop in temperature because with the ice formation on the plant, it will no longer be exposed to devastating temps. However, when strawberry flowers are in tight clusters they can tolerate temps as low as 22°F.
- Keep in mind a freeze event following a period of warm weather is the most detrimental.
- Straw mulches should have been removed as the strawberry plants are beginning to grow.
- Applying synthetic row covers can increase yields, accelerate plant development, and protect against fluctuating spring temperatures.
- Scout the fields for disease. If there was evidence of leaf spot, leaf scorch, or leaf blight on last year's leaves – start developing a fungicide spray program for the upcoming season.
- Springtime weed control if there was no herbicide applications in the fall.
  - For over wintering broadleaf weeds, 2,4-D at 2-3 pints per acre with 25-50 gal of water per acre is labeled when strawberries are still dormant.
  - Poast can be used in the spring when grasses are around 6 inches tall. However, Poast cannot be used within 6 weeks after Sinbar applications. Do not mix Poast with other chemicals, and no more than 2½ pints/acre/season of Poast can be applied.
  - Stinger can be used for specific broadleaf weeds, provides good control for thistle. In established fields, apply after last picking or in early spring, but 30 before harvest. For thistle control apply early spring or later in the summer after seed dispersal. DO NOT tank mix. DO NOT apply within 6-8 hours of expected rainfall or irrigation. Apply 1/3 to 2/3 pints to 20-75 gallons of water per acre. Making 1-2 applications per year without exceeding 2/3 pints per acre per year.

## Raspberries

**Early season reminders:**

- Pruning should be completed by budbreak
- Apply nitrogenous fertilizers; a general rate of 50lbs actual N/acre on one-year-old plants, 75lbs actual N/acre two year old or older plants. Apply at budbreak in one application or split between budbreak and June.
- Consider root rot control. Apply Ridomil or Aliette to control Phytophthora root rot. Ridomil is a soil drench whereas Aliette is foliar applied.
- Apply pre-emergent herbicides if adequate control was not applied in the fall.
- Prepare trellis systems while vegetative growth is minimal.
- Consider cane disease control. Apply a delayed dormant spray of lime sulfur at budbreak (when buds show ¼" to ½" green, sprays after that can cause leaf burn)
- Consider fruitworm or raspberry sawfly control if there was a problem last year. Adult emergence occurs around late April – early May. Sevin is the product labeled for control of these pests.

## Blueberries

**Seasonal reminders:**

- Pruning should be completed by April. Remove old, diseased canes at ground level, detail prune to remove twiggy wood, thin out canes to provide adequate sunlight – leaves need 30% full sunlight for good fruit production, main goal is to have 10-20 healthy canes varying in age and height.
- Weed control should have been addressed in the fall. Maintain clean paths in between rows to decrease insect populations.
- Apply nitrogenous fertilizers. Split the total quantity of nitrogen into two applications, one at flowering and one in June. For mature plantings, a good all purpose mix is 1000 lbs of ammonium sulfate or urea and 1000 lbs of Sul-Po-Mag. Use ammonium sulfate where pH >5.0.
- Consider springtime disease control. Plants are susceptible to mummyberry infestations from green tip through full bloom. Indar was granted a section 18 for NYS; this provides best control for primary infections. Cane diseases can be reduced by applications of lime sulfur, when plants are still dormant.

# **SMALL SCALE FRUIT AND VEGETABLE PRODUCTION FOR EXTRA INCOME OR AS A PRACTICAL AND PROFITABLE FARMING ALTERNATIVE**

*Richard Gast, Extension Programs Assistant, Horticulture and Natural Resources, CCE Franklin County, Malone, NY.*

New York State has long been a national leader in fruit and vegetable production. And with per capita consumption of most fresh fruits and vegetables on the rise, New York's produce growers can expect to see continued strength in market prices for years to come.

Statewide, sales of locally grown, high quality fruit and vegetables at roadside stands, u-pick operations, and farmers markets represent a growing segment of our agricultural and rural economies. And these types of small businesses are becoming increasingly important to the success and viability of our family farms.

Throughout Franklin County, growing numbers of area buyers are purchasing locally grown fruit and vegetables. They know that nothing beats the taste of fresh, juicy strawberries, flavorful raspberries and blueberries, crisp, mouth watering apples, delicious sweet corn, and vine-ripened tomatoes, just to name a few.

So, with local farmers seeing lower prices for milk, and unpredictable and often weak market prices for cattle, hogs, corn, and grain, it comes as no surprise that interest in small-scale crop production is growing. The reasons are obvious. Small-scale crop production has tremendous profit potential. Because smaller quantities of produce can be grown, and a larger amount of the consumer dollar received, it is very possible to generate substantial income with limited resources on small parcels of land.

This profit potential does not come without risks and uncertainties, however. As with any business, there is a necessary initial investment. And growing fruit and vegetables requires hard work and commitment.

Even with a grower's best efforts, the quality, quantity, and flavor of what he or she will have to sell are unpredictable. North Country growing seasons can vary enormously from week to week, month to month, or year to year. Producing and providing the highest quality fruit and vegetables possible requires accurate planning, and scheduling that allows for varying weather conditions.

Pest management is another consideration. Although insects, diseases and weeds can be controlled, any or all of these can quickly become costly problems for growers, especially those that are unfamiliar with pesticide use regulations.

To attract customers, growers must actively and aggressively market their produce. To meet their customers' demands and encourage repeat sales, they must grow high quality crops. And because it is not often possible for growers to distinguish their products from those of their competitors, roadside stands must offer customers quality products in a clean, friendly, welcome environment.

Balancing the demands of production and marketing can be difficult. Dependable help must be available when needed. The cooperation of several family members, each with his or her own responsibilities may be required, if your small scale fruit and vegetable business is going to be successful. It is not at all unusual to see children and grandparents minding the stand or collecting money from u-pick customers while mom and dad work in the fields. Thus, kids are given an opportunity to earn a few dollars and learn money, business, and people skills, as well.

There is a great sense of personal pride and independence that can be derived from owning and operating your own small business. And tremendous satisfaction can be realized by producing and selling high quality produce to happy, satisfied customers, as well.

But, before you invest money, time, and energy, it is advisable to at least evaluate your personal skill and experience in production and marketing. Then consider your financial resources and business acumen, as well. This will help you to assess your project's overall feasibility.

# THE NEW AMMONIUM NITRATE FERTILIZER SECURITY LAW AND REGULATIONS

Due to concerns over the potential for the use of ammonium nitrate fertilizer in the manufacture of explosive devices, legislation was passed and signed into law regulating the sale of ammonium nitrate to limit the potential for it to fall into the hands of those who would misuse it. Although ammonium nitrate is a highly beneficial fertilizer, it has been identified by the National Academy of Sciences as the most likely material to be misused as an explosive, as it was in the Oklahoma City bombing.

The new law (AML 146-f), charged the New York State Department of Agriculture and Markets, in consultation with the New York State Office of Homeland Security, with establishing procedures that better ensure the safe use and handling of ammonium nitrate and ammonium nitrate materials. Effective November 28, 2005, the law and Department regulations provide:

\* Any person or entity in New York State that sells, offers for sale, or otherwise makes available, ammonium nitrate or regulated ammonium nitrate materials is required to annually register with the Department for a fee of \$50.00. Persons and entities who already pay fees pursuant to Agriculture and Markets Law Article 10 are exempt from an additional fee, but not from registration.

\* A "regulated ammonium nitrate material" is defined as "*a fertilizer in solid form, comprising a mixture of components, one of which is ammonium nitrate, in circumstances where the nitrogen content derived from ammonium nitrate is more than twenty-eight percent of the material by weight.*"

\* All purchasers of ammonium nitrate and ammonium nitrate materials must provide proper identification and information on intended use before purchasing ammonium nitrate or regulated ammonium nitrate materials. A record of sale must be completed for each purchase on the form prescribed in the regulations.

\* All sales records must be retained for a 2 year period and be available for inspection by the New York State Department of Agriculture and Markets or New York State Office of Homeland Security.

\* Ammonium nitrate and ammonium nitrate materials must be stored in a secure location. The storage facility must be enclosed and locked when unattended. Suitable enclosures include sales buildings, warehouses or perimeter fences. Daily inspections for attempted entry, vandalism and structural integrity are required.

The Division of Plant Industry has initiated inspections to ensure compliance with the new law. Fertilizer facilities and retail establishments will be inspected and merchants should expect to see proper identification prior to allowing access to their facility.

Information concerning the new ammonium nitrate security law and regulations is posted on the Department of Agriculture and Markets' website at [www.agmkt.state.ny.us](http://www.agmkt.state.ny.us).

Any questions concerning this program may be addressed to Bill Nastyn at the Department of Agriculture and Markets (1-800-554-4501). The Department also requests anyone who purchases ammonium nitrate from a vendor who does not require proper identification to contact Mr. Nastyn.

(Source: NYS Department of Agriculture & Markets)

## NEW WEB SITE FOCUSES ON CLIMATE CHANGE AND AGRICULTURE IN THE NORTHEAST

A new resource has been developed by several science experts at Cornell and other universities in the Northeast, with funding from a NE-SARE grant. The [Climate Change and Northeast Agriculture](#) web site provides a unique and comprehensive set of resource materials on climate change, potential impacts of climate change on agriculture, and cost-effective adaptation strategies for farmers. Opportunities for reducing greenhouse gas emissions on farms and for entering the energy market place for renewable energy sources are covered.

The site features downloadable "fact sheets" and PowerPoint presentations (with detailed notes for slides) on topics ranging from: basic climate science and evidence of climate change in the NE; impacts on crops, insects, pests, pathogens,

weeds, and livestock; energy use on farms; and opportunities for farmers to enter the energy marketplace (e.g., growing "fuel" crops). There also is a comprehensive section of related web links.

Comments or, questions, updates, and requests should be directed to: [info@climateandfarming.org](mailto:info@climateandfarming.org).

## **MUST BEE TIME: HONEY BEES AND POLLINATION**

*Nick Calderone, Associate Professor, Dyce Laboratory for Honey Bee Studies, Department of Entomology, Cornell University's College of Agriculture and Life Sciences, Ithaca, NY 14853.*

### **PART I: GETTING THE MOST POLLINATION FOR YOUR DOLLAR**

**T**ree fruits, small fruits, and many vegetable crops, especially many of the vine crops, all require pollinating insects for a successful harvest. Remember! Not only is pollination important for a high yield, it is just as important for fruit size, shape and sweetness. A number of insects pollinate crops; but, for several reasons, the honey bee is the most versatile pollinator. Honey bees are available in large numbers throughout the growing season, they pollinate over 90 commercial crops, they are easily transported by truck, and they can be easily distributed throughout large plantings. In addition, they restrict their foraging activities to a single species on any given trip to the field. Compared with other pollinators, honey bees are very cost effective. A single strong, two-story colony provides 15-25 thousand foragers.

#### **How many colonies**

New York growers have traditionally used about one colony of bees per three acres for apple pollination. This number may have been adequate in small orchards visited by feral honey bees and by solitary bees and bumble bees from adjacent hedgerows and woods. However, wild honey bee populations have been greatly reduced by parasitic bee mites, and modern agricultural practices have eliminated many natural nesting sites for solitary bees and bumble bees. In addition, the flight range of solitary bees is not generally sufficient to ensure coverage of the interior portions of large plantings. Growers with large blocks of apples and other tree fruits may wish to increase the number of hives to one per acre. Modern cultivars with high blossom densities, such as trellised apples, also require more pollinators. If your fruit set has been lower than expected in the past, or your fruits are lopsided or misshapen, you probably need to use more bees. Remember, if your fruit set is too high, you can always thin, but if it is too low, you are just out of luck. Move bees into apples, regardless of variety, right before the king blossoms begin to open.

#### **Special requirements**

Most other crops are adequately served by a single strong colony per acre; however, some crops have special requirements.

**Red Delicious** apples have a flower structure that is different from that of most other common varieties such as McIntosh. The anthers on Red Delicious flowers are widespread, and bees learn to insert their mouthparts between them to obtain nectar. Consequently, the bees do not contact the flower's sexual parts and pollination does not take place. Since it takes time for bees to learn to obtain nectar in this way, you can counteract this problem by using more colonies per acre to increase the number of inexperienced bees in the orchard. Up to two colonies per acre may be needed in large stands of Red Delicious apples.

Pollination of **pears** will probably always be a problem because pear nectar contains only about 15% sugar versus 40% for apples, dandelions, and yellow rocket. The answer is to move the bees into the center of the pear block when the pears are at 50% bloom. It will take some time for the bees to discover better sources farther away, and in that time, the pears may be adequately pollinated. An alternative is to use more colonies per acre, which will increase the number of bees foraging within the orchard. **Sweet cherries** should be pollinated soon after they open. Therefore, bees should be moved in the day before bloom. Since sweet cherries require a high fruit set for a commercially viable crop, and since they bloom early in the season when the weather is often unfavorable for foraging, two colonies per acre may be required. Research at the Geneva Experiment Station has shown that **strawberries** benefit substantially from having hives of bees in the field during bloom.

#### **Hive Placement**

To obtain maximum benefit for your pollination dollar, always select good locations for the bees you rent. A good location slopes slightly to the south, is protected from the prevailing winds, is dry, and has as much exposure to sunlight as possible. It is important that colonies of honey bees be kept in full sunlight in order to warm the hives rapidly in the morning and entice the workers out of the hives on chilly spring mornings. Entrances should face south to southeast whenever possible.

Keep colonies on pallets or cinder blocks to keep the bottom boards 4-8 inches above the ground. Hives with wet bottom boards will be cooler and have less foraging activity than dry colonies. A hive stand will also keep colonies above tall grass, which may shade or block the entrance. Place colonies in groups of 4-6 to take advantage of good locations. In large orchards and fields, groups of 10-20 hives can be used to take advantage of prime locations. It is best to locate hives near pollinizer rows where that consideration applies, such as with apples and sweet cherries.

### **Pesticides**

Overall, pesticides are less of a problem to bees and beekeepers today than they were 10 and 20 years ago. Nevertheless, serious poisoning incidents still occur. It is important to read the pesticide label and to avoid using materials that are especially toxic to bees when there is a safer alternative available. Sevin (carbaryl) and Guthion (azinphos-methyl) are especially toxic to bees.

You can eliminate most pesticide damage to bees by following a few simple rules. Never apply pesticides to flowers in bloom, as this will contaminate the pollen and nectar collected by the bees. Unfortunately, pesticides often drift onto non-target crops and weeds, and honey bees are poisoned when they ingest the contaminated pollen and nectar. Therefore, do not apply pesticides when there is a danger of drift. Keep flowering ground-cover plants mowed if you are going to spray in an orchard during the summer. Clover and dandelions are a common problem for bees on orchard floors. If mowing is not possible, use an herbicide for control.

Bees can also be poisoned when they collect water from sources that have been contaminated by drifting pesticides. Standing water in wheel ruts or old tires near your fields are prime sources of contaminated water. Provide a source of clean water near the hives. A wash tub filled with fresh water and straw works well. The straw gives the bees a place to land and drink without drowning.

You can minimize the dangers from drift by restricting spraying to periods when the winds are less than 5 mph. If possible, begin to spray in the evening, about an hour before sunset, because there is generally little wind at that time. Always use the largest droplet size possible when spraying, and check out the use of spray stickers to help minimize drift. Always dispose of empty pesticide containers in an appropriate manner. Remember! If too many bees are killed, your crops will not be adequately pollinated, and it may be necessary to rent more bees.

### **General Recommendations**

Bees should be moved at night, and once the hives have been placed on location, they should be left there until the job is done. Moving bees in the daytime and moving them short distances at any time (less than 3 miles as the crow flies) will result in a serious loss of foragers and seriously damage the colony. Always contact the beekeepers if the need arises to move the bees. If you live in an area with known bear problems, use an electric fence to protect the bees. Keep nearby flowering plants mowed to reduce competition for the bees' attention.

### **The Beekeeper**

I recommend establishing good working relations with several beekeepers to ensure that you have a ready supply of bees for pollination. Any individual beekeeper's situation may change over time, but if you work with several beekeepers, you should always have access to an adequate supply of colonies.

### **Availability and Pollination fees**

During the past 5-6 years, beekeepers have learned a lesson all too familiar to most farmers: eventually, pests become resistant to pesticides. Today, honey bee colonies are often infected with strains of parasitic mites that are resistant to one or more pesticides, making control unpredictable or impossible. This fact has contributed to the high losses reported over the last several years. Almond growers in California are desperately trying to attract beekeepers for pollination. In addition to the \$150.00+ offerings per colony, some growers are also willing to pay trucking fees to bring in bees from around the country. Growers should expect to pay a premium for colonies this year. The best strategy is to lock in your spring pollination needs towards the end of the previous year. Prices and availability are volatile, so a contract will help to ensure that you get the hives you are expecting, when you are expecting them and at the price you are expecting.

It is wise to make payment schedules contingent on colony strength, with stronger colonies commanding higher rental fees than weaker ones. A good method is to specify a base price to be paid for a colony of a specified strength -- measured in terms of combs of bees and combs of brood. Bonuses and penalties can be based on deviations from those specifications. Remember! The best deal may not always be the cheapest deal.

### **Expectations**

Remember! Bees are an essential part of your crop production system, but they are only one part. In many ways, they are like the fertilizers and chemicals that you buy. Each is essential, but none of them, by themselves, can guarantee a crop. Many things influence the quantity and quality of your crop. One is the weather. Bees will visit flowers and pollinate only if they can fly. Cool, rainy, and windy weather will delay, slow, or stop flight, and the beekeeper cannot do anything about

the weather. Excessive heat during the summer can cause problems with fruit set in certain crops, like pumpkins. Again, this is beyond the beekeeper's control. Be clear up front about your expectations concerning the strength of the colonies you rent, and satisfy yourself that you have received what you expected. This will eliminate misunderstandings down the road.

#### **TIP**

Planning a new orchard? Be sure to determine if your main cultivars are self-sterile - like McIntosh and Red Delicious apples -- or, worse yet, self-sterile **and** inter-incompatible, like many popular cultivars of sweet cherries. If so, be sure to plant an adequate number of pollinizer cultivars. Be sure you select compatible pollinizers that bloom at the same time as your main variety. If you do not have pollinizers in your self-sterile stands, you can purchase compatible pollen and hive inserts, and let the bees you rent for pollination distribute the pollen from the hive to the blossoms.

## **PART II: Honey bees, Rental Fees, and Pollination Contracts**

Making a decent living from farming demands close attention to costs, and it is only reasonable that a grower should seek out the best price for each of the inputs that go into his or her crop production system. When it comes to honey bees, however, most growers understand the need for quality hives, but they don't have the expertise to assess that quality. Most growers don't look inside the hives to see what they are renting, and even if they did, most wouldn't know a good hive from a bad hive. The result is that the emphasis is usually on unit cost or number of boxes, rather than the actual value of the hive. This is not the best strategy for ensuring adequate pollination.

The best way to ensure the quality of the hives you rent is to spell out specifications for colony strength, payment fees and schedules, bonuses and penalties in a contract with the beekeeper. When you get the bees, take the time to inspect them to make sure that they meet the agreed upon specifications. You may need to hire an independent beekeeper to do this. The other thing you can do to ensure a sustainable supply of high quality honey bees for pollination is to pay well. That's right! Don't shop the bargain basements. It pays to pay top dollar for the top hives. If you make it possible for a beekeeper to make a living without cutting corners, you both win in the end.

A contract is less a matter of trust and more a matter of memories, which often fade after a few months. A contract should be drawn up several months before the bees are needed and should, at a minimum, address the following items:

1. Contact information.
2. Arrival/departure dates.
3. Delivery locations (if the beekeeper is not familiar with your operation, specify that a grower representative will meet the beekeeper at the delivery site and see to it that the bees are placed at the right locations using reasonably well maintained roads).
4. The % of hives the grower will inspect (beekeeper is encouraged to participate).
5. Bonuses for hives placed in areas that are hard to reach.
6. Accommodations for helping with trucks that become stuck.
7. Accommodations for legitimate problems, like truck breakdowns, that arise from time to time (ask that the beekeeper stays in communication with the farm starting at least a month before anticipated delivery date).
8. Definition of a base unit and a fee for a base unit. A reasonable base unit is a colony with 6-7 deep frames of brood and 8 deep frames of bees.
9. Fee schedule:
  - 0-3 frames brood = \$0.00
  - 4-5 frames brood and bees = 20% less than base
  - 4-5 frames brood with a full box of bees = base rate
  - 6-7 frames of brood and 8 combs of bees = base rate
  - 8-10 frames of brood and full box of bees = 20% above base rate
10. In addition to the single story hive spelled out above, the colony should have an empty brood chamber and maybe a medium honey super. This will give the bees room to grow, and that's what makes them collect pollen.
11. Bear fences if supplied by the grower: deduct set amount per fence.
12. Bear fence if supplied by the beekeeper: add set amount per fence.
13. Responsibility for setting up electric fences, if needed, to protect against bear damage.
14. Responsibility for the cost of bear damage.
15. Payment schedule: e.g., pay 1/3 upon delivery, 1/3 within 2 weeks of departure, and 1/3 within the next 30 days.
16. Penalty schedule for late payments: e.g., if grower fails to pay on time, add 1/2% interest per month to the balance.

Remember! You can hold the beekeeper to a high standard if you pay a reasonable fee, and, in return, the beekeeper will be more than happy to do whatever it takes to keep your account. That is all part of sustainability.

*(Reprinted with permission from: Scaffolds Fruit Journal, Vol.15, No. 6, April 24, 2006)*



# FOCUS ON IMPORTANT ARTHROPOD PESTS OF RASPBERRY

*Greg English-Loeb, Associate Professor of Entomology, NYSAES, Cornell University, Geneva, NY 14456*

**Y**ou can find a diversity of insects and related arthropods in a raspberry planting. Most of these are innocuous, some are beneficial and some have the potential to be pests. It behooves the grower to know something about these potential pests so they can correctly determine if they are present in their planting and what they can do about it. Obviously growers have a lot to keep track of and arthropods are just one of them, but there are some general things to know or do to help simplify the process. First, you need to regularly monitor the planting for pests or pest damage. And when monitoring, you should know what to look for and when to expect it. In this article I want to review the most likely arthropod pests you might encounter in brambles, when they are most likely to show up, what their damage looks like and what can be done about it terms of pest control.

There are a number of potential pests of raspberries to be concerned with during the growing season. Be on the alert for feeding damage from the adult raspberry fruitworm (a beetle, light brown in color, see Figure 1) on foliage and fruit buds during the prebloom period. The larvae of this beetle pest feed inside flower buds and young fruit (Figure 2). Adult feeding damage on foliage creates a skeletonized appearance somewhat similar to the feeding damage caused by larvae of raspberry sawfly (pale green caterpillar-like body with many long hairs, Figure 3, damage shown in Figure 4). Both the fruitworm and the sawfly appear during the prebloom period. Carbaryl [Sevin] is labeled for both of these pests and the timing is similar as is Spintor [spinosad].



**Figure 1**



**Figure 2**



**Figure 3**



**Figure 4**

Tarnished plant bug (TPB) is another potential problem for raspberry growers during the period from bloom to harvest. Both the adults (Figure 5) and their nymphs (Figure 6) can cause deformed fruit (Figure 7), although the deformities are not as obvious in raspberries as in strawberries where TPB is also an important pest. We do not have a good estimate of the economic threshold for TPB in raspberries but a rough guide would be 10 to 20% of canes infested with adults or nymphs. Carbaryl is labeled for control of TPB on raspberry. It's not the most effective material on plant bugs but pretty much all we have with plant bugs specifically on the label. Malathion can be effective against TPB, but I have yet to find a product registered in NY with plant bug on the label for caneberreries. Note that weedy fields aggravate TPB problems since the adults and nymphs will feed on a wide variety of weed species.



**Figure 5**



**Figure 6**



**Figure 7**

Raspberry cane borer and related beetle species make their appearance during this period. The adults (Figure 8) emerge in the spring, mate and start laying eggs. Larvae (Figure 9) bore into canes during the season and for some species, the next season. They cause injury and death to canes and potentially entire crowns. The best time to kill adults is during the late prebloom period (for summer-bearing raspberries), although note that there is nothing specifically labeled for it now that methoxychlor [Marlate] is no longer available. As an alternative to insecticides, during the season remove wilted shoot tips (Figure 10) below the girdled stem (two rows of punctures around an inch apart, Figure 11) where the egg of the raspberry cane borer has been placed. Also, during the dormant season remove and destroy canes with swellings.



**Figure 8**



**Figure 9**



**Figure 10**



**Figure 11**

Potato leafhoppers (both adults-**Figure 12** and immatures) also begin appearing in New York farms after bloom. This species overwinters as adults in the southeastern USA and then migrates north in spring and early summer (it does not overwinter). They feed on a lot of different crops including many small fruits like strawberries, raspberries, and grapes. They use their soda-straw like mouthparts to pierce the water conducting vessels of the plant (xylem) and suck out water and nutrients. If this were all they did, it probably would not cause much problem. But they also inject saliva into the plant and for some species this causes a strong reaction in the plant. Typical symptoms include yellowing of leaf margins and distorted and possibly stunted leaves (**Figure 13**). Different plant species respond differently and some are very sensitive while others are not. Raspberries, grapes, and strawberries are pretty sensitive. The adult potato leafhopper is iridescent green and wedge-shaped while the nymph is usually green and moves sideways in a unique manner when disturbed. If injury to foliage is moderate to severe, control may be necessary. Sevin [carbaryl] and Malathion 57 EC are labeled for potato leafhopper on raspberries but note there is a 7 days to harvest restriction for Sevin but only a 1 day restriction for Malathion.



**Figure 12**



**Figure 13**

I should also mention two-spotted spider mite (TSSM, Figure 14) as a potential pest. These tiny spider-like arthropods can become very numerous on foliage, causing white stippling on leaves (Figure 15). They seem to be most problematic in dry sites and/or in mild growing areas such as the Hudson Valley and Long Island, although I can usually find a few in most plantings during the summer period. Note that we don't have a good assessment of the economic threshold for TSSM on raspberries but a rough guide would be about 50% of leaves with at least one mite present. As of a couple of years ago there is a miticide registered in New York for control of TSSM (Savey DF). Predatory mites can also provide control of TSSM. These beneficial mites are frequently naturally present in raspberry fields, especially where few broad-spectrum insecticides are used, but can also be purchased from a supply house. For both Savey and predatory mites, it's important to start control actions early before you see lots of severe injury to foliage (bronzing).



**Figure 14**



**Figure 15**

Another pest that can cause serious injury to canes and the crown is the Raspberry crown borer. The larvae of this moth (Figure 16) feed at the base of the cane and into the crown over a two-year period. The first signs of a problem often appear during fruit maturation. The withering of and dying of canes, often with half matured fruit, can be a symptom of feeding damage at the base. Canes with these symptoms, and the associated crowns, should be removed during the growing season and destroyed. The adult moth actually does not appear until later in the summer (early August). It is a very attractive moth that superficially resembles a yellow jacket (Figure 17). Guthion was labeled for use against raspberry crown borer larvae through the 2006 season but will no longer be allowed after this September. For the 2006 season the pyrethroid insecticide bifenthrin (Capture) has been approved for use against crown borer. Apply to lower parts of canes and soil in fall to kill newly hatched larvae or possibly in the spring to kill overwintered larvae that are attempting to bore into canes. Research conducted at the University of Arkansas suggests the fall application is the more effective timing.



**Figure 16**



**Figure 17**

Although this is not an exhaustive list, the pests included in this article are the most likely to cause you problems. Some other species that might show up include sap beetles feeding on ripe and over ripe fruit (picnic beetles, fig 18, have black and white spots, strawberry sap beetle, Fig. 19, is smaller and brown in color) and adult Japanese beetles (Fig. 20) feeding on foliage. For additional information consult the 2006 Cornell Pest Management Guidelines, Raspberry Production Guide, or the Compendium of Raspberry and Blackberry Diseases and Insects.



**Figure 18**



**Figure 19**



**Figure 20**

There are several useful web sites to consult for pest management information. Marvin Pritts of Cornell University put together a valuable diagnostic tool for the web to help you identify pest problems in small fruit crops. The web site address is <http://www.hort.cornell.edu/departments/faculty/pritts/BerryDoc/Berrydoc.htm>. Also, a new website for bramble pest management has been recently launched by NABGA (North American Bramble Association). Doug Pfeiffer, Professor of Entomology at Virginia Tech, put this useful resource together. The web site is <http://www.ento.vt.edu/Fruitfiles/NABGAIPMSite/NABGAIPMHome.html>.

**References:**

Pritts, M. et al. 2006. Cornell pest management guidelines for small berry crops. Cornell Cooperative Extension.

Pritts, M. and D. Handley (eds). 1998. Raspberry production guide. Northeast Regional Agricultural Engineering Service.

Ellis, M., R. Williams, and B. Williamson. 1991. Compendium of raspberry and blackberry diseases and insects. APS Press.

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# BRAMBLE DISEASE MANAGEMENT- AN OUNCE OF PREVENTION IS WORTH A POUND OF CURE!

*Cathy Heidenreich, Small Fruit Extension Support Specialist, Department of Horticulture, Cornell University's College of Agriculture and Life Sciences, Ithaca, NY*

**W**hat does it take to consistently produce high quality bramble fruit? Some would say sheer luck; others might cite things like favorable weather, excellent soil, the “proper” cultivars, a good fertilizer program, ample irrigation, excellent pest management, etc. And, in fact, all of these things in concert determine final fruit quality.

That said, let's consider in particular disease management and the direct and indirect impact it has on fruit quality. Gray mold is a perennial problem in bramble fruit production, and is the number one cause of loss of fruit quality and yield. Cane diseases and root rots (spur and cane blights, Phytophthora root rot, Verticillium wilt) weaken brambles over time to such a degree yields are reduced or in some instances, lost. They may also make brambles more susceptible to winter injury and subsequent death. Other bramble pathogens such as powdery mildews, rusts and anthracnose may infect multiple plant parts including leaves, canes, flower buds, and fruit. Virus diseases such as Raspberry Mosaic Virus Complex or Crumbly Berry may reduce plant vigor and productivity and/or fruit quality.

What's the secret, then, to good bramble disease management? It's quite simple: Bramble disease management needs to be proactive to be successful!

While the concept itself is simple to understand, the implementation of it involves serious forethought and energy. Successful bramble disease management requires a short-term commitment to get it started in your operation, and a long-term commitment to sustain it as part of your every day operation. Let's take a look at the steps involved in setting up a proactive bramble disease management program. We will start at ground zero with a new planting and then work through disease control strategies for established plantings. We will finish up with a bramble disease management checklist by way of review. Ready? Set? Go!

## **Before You Grow**

Whether you are a first time grower or have been in the business for an extended period, there are some basic things to consider in terms of disease management before you put in a new planting. There are 4 key items that you need to identify before you begin: your plant host, potential diseases, environmental conditions favoring their build up, and potential control strategies.

### *Know your hosts*

There is, for the most part, some degree of host susceptibility/resistance to each of the bramble diseases previously discussed. That means the cultivar you select may determine in part what disease problems you face. Do your homework and determine to which diseases your host is most susceptible. Does the dollar return on sales substantiate the investment needed for disease control on a particularly susceptible variety? If not, consider selecting an alternate variety of comparable quality with greater host resistance. Does the planting site or some portion of it favor development of a particular disease? If so, be sure to put your most resistant varieties in that area and locate more susceptible varieties on more favorable sites. A word of warning, in the case of root rot diseases, even the most resistant cultivars may fail under favorable environmental conditions and high disease pressure...

### *Identify potential diseases*

Now that you have researched your hosts and know their relative susceptibilities to various diseases, you need to explore what diseases may pose a threat in your area. What bramble diseases are most common in your geographic region? Your locality? Are there other operations in the vicinity? What disease issues do they have?

### *Determine Environmental Conditions Favoring Disease Development*

Take a good look at your planting site. Then look again. And again...Is there an air or water drainage issue that cannot be redressed? Is it located next to hedge rows or abandoned fields with high populations of wild brambles? Is it in a frost pocket that may result in cane injury? Perhaps it's an exposed site with a lot of strong winds. Or a site next to a hedgerow which is shaded a good part of the day. What were the crops previously grown on that site? Crop history in solanaceous plants such as potatoes, tomatoes, peppers etc. may have facilitated population buildup of Verticillium, which may persist in soil over periods of 10 years or longer. Even solanaceous weeds, such as nightshade serve as hosts for Verticillium.

One or more of these factors may favor disease development in your new planting.

What time of year are diseases most likely to occur? How often do they occur during the season? What conditions favor their build up? Are they weather related? Related to host growth stage? At what point do you need to take action? Are there established action thresholds?

#### *Explore short-term and long-term control options*

What are your options to help prevent an outbreak? They are three-fold: cultural, biological, and chemical.

**Cultural methods - Exclude, Inhibit or Limit, and Eradicate!** Starting with disease free plants is important for all diseases, but particularly important for orange rust and viruses. Always check to see if disease resistant cultivars are available and use them if feasible.

Select sites, soils and planting designs carefully to maximize air and water drainage. Maintain plant health by properly managing soil nutrition and irrigation, and minimizing plant wounding. Use physical barriers such as distance, mulches, row covers etc. Remove and destroy debris from pruning and harvesting operations immediately. Harvest ripe fruit promptly.

And finally, remove infected plants as soon as they are identified; this is especially important in the case of orange rust or viruses.

**Biological methods** – Perhaps you have heard the saying “Little bugs have little bugs to bite ‘em, lesser bugs have lesser bugs, and ad infinitum!” More and more biological control organisms are now being produced on a commercial basis and may be available for use in disease suppression or prevention. For example, there is now a benign strain of the crown gall bacterium (K84) that maybe applied to bramble cuttings to help prevent infection by more virulent strains. Other pathogen predators, parasites or competitors may have been identified and made available commercially to help in the fight against bramble diseases.

**Chemical methods** - What disease control products, if any, are available to you as a commercial grower, as an organic grower? Check out these websites for more information:

Products labeled for use in NY State:

<http://www.pmep.cce.cornell.edu>

OMRI approved products (organic)

[http://www.omri.org/OMRI\\_datatable.htm](http://www.omri.org/OMRI_datatable.htm)

## **When You Suspect a Disease**

Like death and taxes, disease problems are inevitable. The steps above can often help delay or minimize the occurrence of diseases, but will not completely eliminate them. So, what to do if you suspect a disease? Now's the time to get out your hand lens and do a little detective work!

### *Sleuth out the Suspects*

There are three prerequisites to disease detection- a keen eye, frequent observation, and good notes!

It's good to get out in the field early in the season and keep good notes about your plants' health. Use notes on healthy growth and development as a “baseline EKG” to evaluate how plants are doing during the course of the current season or between seasons. This makes it easier to spot occurrences of an unusual nature: one section of field that is behind in growth compared to another, brown flecking on leaves, wilting, spots on canes, yellowing of green tissue, dead canes, swellings, stunted plants, etc.



Be sure to bring along the tools of the trade and do some CSI investigating of your own. These tools might include a field pack with the following: hand-lens, sample bags, trowel, pocket knife, pruner, permanent marker, note book, pencils or pens, and a map of each field to be scouted, pocket ID guides.

Record disease information on the maps during scouting; use maps to calculate areas for control measures, if needed.

Look for anything out of the ordinary. Record the specific plant part affected, and how it differs from a healthy plant (symptoms). Note the presence or absence of a pathogen (signs). Are there patterns of distribution on the plant, in the row, in the field? Does the appearance of damage (symptoms) correlate with a specific event: weather, crop production procedure, chemical application, other...)?

**Table 1. Bramble Development and Associated Diseases**

<u>Summer-Fruiting Raspberries/Blackberries</u>	<u>Primocane-Fruiting Raspberries</u>
<ul style="list-style-type: none"><li>• <i>Bud break</i><ul style="list-style-type: none"><li>○ Anthracnose</li><li>○ Spur blight (red raspberries)</li><li>○ Cane blight</li></ul></li><li>• <i>Early bloom</i><ul style="list-style-type: none"><li>○ Gray mold</li><li>○ Powdery mildew</li></ul></li><li>• <i>Full bloom</i><ul style="list-style-type: none"><li>○ Gray mold</li><li>○ Powdery mildew</li></ul></li></ul>	<ul style="list-style-type: none"><li>• <i>From petal fall through the beginning of harvest</i><ul style="list-style-type: none"><li>○ Gray mold</li></ul></li></ul> <p><u>Special Pests</u></p> <ul style="list-style-type: none"><li>• Raspberry leaf spot</li><li>• Orange rust</li><li>• Verticillium wilt</li><li>• Phytophthora root rot</li><li>• Crumbly berry</li><li>• Mosaic virus complex</li><li>•</li></ul>

### *Confirm Your Diagnosis*

Have good diagnostic resources and/or references at your disposal on the farm or online to help in making your initial diagnosis. A list of suggested bramble resources is provided for you in the bibliography following this article.

Remember, not all disease is caused by a living organism such as a fungus, bacterium, virus, etc. Abiotic diseases often occur and may have symptoms similar to those caused by pathogens. Here is a short review of probable causes of abiotic disease:

- *Nutrient extremes*
  - deficiencies, toxicities
- *Temperature extremes*
  - winter/frost injury, ultraviolet radiation/heat
- *Moisture extremes*
  - drought, flooding, relative humidity
- *Phytotoxicity*
  - adverse reactions to chemicals
- *Environmental damage*
  - wind, hail, lightning strikes
  - air pollution, acid rain, wildlife
  - mechanical injuries and wounds

Consult your local cooperative extension office or regional specialist if you are unable to identify the disease with resources at hand. Or alternatively, send a sample to a diagnostic lab for further testing or confirmation.

### **Apply Control Strategies**

Carefully follow all label instructions when applying control products. (Note: Both the crop **and** pest must appear on the NY label!) Always apply products or biologicals at the label recommended rates. Use sufficient volume and pressure to get thorough coverage of plant material. Maintain and calibrate application equipment on a regular basis. Store any remaining product according to manufacturer instructions.

A word to the wise on fungicide resistance development; because brambles are a relatively small market share for fungicide companies, fewer numbers of products are available for use on these crops as compared to other major fruit crops, such as apples or stone fruit. To maximize the efficacy and minimize fungicide resistance development for the limited products available, it is wise to alternate chemistries. See product label instructions for more specific information on managing fungicide resistance.

### **Once Disease Control Strategies are in Place**

Continue to monitor disease-related information after control measures are in use. Was the control measure effective? Has the occurrence or frequency of the disease been reduced to acceptable levels? Is there a need for future concern? Keep records to help determine the effectiveness of your control strategies, and provide information for next year's disease scouting forays. Adjust strategies as needed until acceptable levels of control are achieved.



## **In Summary**

The process described above may seem rather time consuming and involved at first, but will pay big dividends in return for your investment. Once you have implemented it fully, it takes only a small amount of time each week to keep it running smoothly. And by the way, many of the general pest management principals listed above may also be used for insects, weeds, and wildlife! How's that for killing several birds with one stone (no pun intended...well, maybe!) Remember that checklist I promised earlier? Here it is!

## **Disease Control Strategies- Preplant**

- Preplant cover crops for suppression of weeds and soil-borne diseases.
- Resistant cultivars.
- Certified, disease-free planting stock.
- Do not establish new plantings next to wild brambles.
- Select sites with good soil and air drainage.
- Orient crop rows with prevailing breezes.
- Space plants properly.

## **Disease Control Strategies- Established Plantings**

- Maintain overall plant health.
- Thin to proper cane density.
- Maintain narrow rows.
- Avoid high rates of nitrogen; succulent growth encourages disease development.
- Prune out old fruiting canes.
- Remove dead and dying canes after harvest.
- Remove and destroy prunings, infected canes, fruit, and debris promptly.
- Consider dormant applications of lime sulfur.
- Scout weekly.

## **Bramble Disease Management Resources**

### **PUBLICATIONS:**

*From Cornell CCE Press:*

[Cornell Pest Management Guidelines for Berry Crops](#) (2006) by Pritts, Heidenreich, Carroll, English-Loeb, and Wilcox.

*From NRAES Press:*

[Bramble Production Guide](#) (NRAES-35) (1991) edited by Marvin Pritts and David Handley. **NOTE:** Second edition is getting ready to go to print.

*From APS Press:*

[Compendium of Raspberry and Blackberry Diseases and Insects](#) (1991) by M. Ellis, R. Williams and B. Williamson.

*From Cornell University Press:*

[Weeds of the Northeast](#) (1997) by Richard Uva, Joseph Neal and Joseph DiTomaso.

### **DIAGNOSTIC SERVICES:**

#### *Diseases*

To submit samples for disease diagnosis, contact Plant Disease Clinic, Cornell University, Department of Plant Pathology, 334 Plant Science Building, Ithaca, NY 14853-4203, (607) 255-7850, or visit <http://plantclinic.cornell.edu>.

#### *Insects*

To submit samples for insect diagnosis or for phone consultations, contact Insect Diagnostic Laboratory, Cornell University, Department of Entomology, 4140 Comstock Hall, Ithaca, NY 14853-2601, (607) 255-3250, or visit [www.entomology.cornell.edu/Extension/DiagnosticLab](http://www.entomology.cornell.edu/Extension/DiagnosticLab).

#### *Soil/Leaf Analysis*

Write to Cornell University, Nutrient Analysis Lab, 804 Bradfield Hall, Ithaca, NY 14853, (607)-255-4540, or visit [www.css.cornell.edu/soiltest/](http://www.css.cornell.edu/soiltest/).

## USEFUL WEBSITES:

*Cornell Pest Management Guidelines for Berry Crops*

<http://www.fruit.cornell.edu/Berries/pestman/index.html>

*Cornell Fruit Website*

<http://www.fruit.cornell.edu>

*Nursery Guide*

<http://www.hort.cornell.edu/nursery>

*Berry Diagnostic Tool*

<http://www.hort.cornell.edu/diagnostic>

*The Tree Fruit and Berry Pathology Website*

<http://www.nysaes.cornell.edu/pp/extension/tfabp/>

*New York State IPM Program*

<http://www.nysipm.cornell.edu/>

*IPM Fact Sheets for Berry Crops*

<http://nysipm.cornell.edu/factsheets/berries/default.asp>

*New York Berry News*

<http://www.nysaes.cornell.edu/pp/extension/tfabp/newslett.shtml>

*Food Safety*

<http://www.gaps.cornell.edu/>

*National Clonal Germplasm Repository for Berry Crops*

<http://www.ars-grin.gov/cor/>

*New York State Berry Growers Association*

<http://www.nybga.org>

*Wildlife Management Information*

<http://wildlifecontrol.info>

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## **PRICING YOUR PRODUCTS TO SURVIVE RISING ENERGY COSTS**

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It should not be a surprise to any of us by now. Due to a variety of factors, natural gas and propane prices have risen considerably over the past few years. Moreover, today's natural gas markets exhibit extreme volatility that makes it difficult for businesses to rely on conventional wisdom and past experience to try to establish an effective energy management strategy. With the high energy needs of many types of agricultural production, producers are becoming increasingly alarmed by the situation. Adding to their concerns, natural gas and electricity prices are linked more closely to one another than ever before.



What is the impact of rising energy costs? Let's look at greenhouse operation, one of the most intensive agricultural production systems, as an example. According to an informal survey of greenhouse growers around New York State, the prices they are paying for natural gas and heating oil have increased 50 percent, and the price of electricity has increased around 20 percent over the last two years. Facing the increase, many greenhouse growers have adopted or are considering adopting one or more energy saving techniques such as reducing air leaks, installing an energy conserving blanket, double covering greenhouse walls, increasing space utilization, updating heating and cooling systems for better efficiency, conserving electricity, improving management, and switching to less energy demanding crops. Combining these techniques, growers can sometimes realize energy savings of 20 to 40 percent.

However, faced with higher and more volatile energy prices, is conservation alone enough to maintain profitability and sustain business growth? I would dare to say no. Moreover, although these energy conservation strategies are all good practices to consider for better management, many of the technologies also require additional capital investment. Further, increased energy prices do not just affect heating and electricity costs. They also affect other input costs such as

greenhouse plastics, fertilizer, and pots; and commonly, growers have to pay higher delivery surcharges for purchases. Besides, the costs of delivering products to customers are also higher due to higher gasoline prices.

How did these all add up? According to the Cornell Greenhouse Business Summary project, in 2003 the heating cost among New York greenhouse operations averaged around 7 percent of sales, the average cost for electricity was around 2 percent of sales, and the average cost for gas for delivery trucks was around 0.7 percent of sales. Moreover, the average costs for fertilizer, packaging materials and other greenhouse maintenance and repair supplies amounted to another 7 percent of sales. Assuming that between 2003 and 2005 the greenhouse operation has not changed any production and management strategies, and during the same period the cost of natural gas and heating oil increased 50 percent, the price of electricity increased 20 percent, and costs for other related inputs and delivery increased 20 percent. Although it is not realistic, to simplify this analysis let's hold the percentages of all other costs stable during the same period. The greenhouse operation would have an increase of production costs of around 30 percent or 5.1 percent of sales. Assuming a greenhouse business has a profit margin of 15 percent in 2003, with these increases its profit margin would decrease 5.1 percent to 9.9 percent.

**Table 1. The Impact of Increased Energy Costs - A Greenhouse Operation Example**

	<b>Cost in 2003 % of sales</b>	<b>Increase between 2003 &amp; 2005 (%)</b>	<b>Cost in 2005 % of sales</b>
Heating fuel	7.0%	50.0%	10.5%
Gas	0.7%	15.0%	0.8%
Electricity	2.0%	20.0%	2.4%
Other affected input costs & fuel surcharges	7.0%	15.0%	8.1%
<b>Total</b>	<b>16.7%</b>		<b>21.8%</b>
<b>Profit Margin</b>	<b>15.0%</b>		<b>9.9%</b>

Along the same line, if a greenhouse business had energy related costs totaled around 10 percent of the sales, an increase between 20 to 50 percent would decrease the profit margin by between 2 to 5 percent. Table 2 demonstrates how increasing energy costs might affect the profit margin.

**Table 2. The Impact of Energy Cost Increases on Profit Margin**

<b>Energy cost before increases as % of sales</b>	<b>Percent of energy cost increase</b>	<b>Energy cost after increases as % of sales</b>	<b>Profit margin decreases</b>
10%	20%	12%	2%
	30%	13%	3%
	40%	14%	4%
15%	20%	18%	3%
	30%	20%	5%
	40%	21%	6%
20%	20%	24%	4%
	30%	26%	6%
	40%	28%	8%

What do all these have to do with marketing? With the greenhouse example, the business is faced with 5 percent lower profitability, or it needs to market much better and sell 50 percent more products to maintain profitability, but then it would have to produce more products and incur more costs. Of course, growers can adopt management and technology to become more energy efficient and maybe look to government regulation to control the energy prices and volatility issues. One marketing component growers have control over and can definitely help the situation is **Smart Pricing**. Some growers have said to me that in order to survive, businesses have to have the "guts" to raise prices. Many greenhouse growers have decided to raise the prices of bedding plant flats 10 percent this year. Many horticultural businesses,

especially wholesale growers, have to determine their prices the summer before. Therefore, growers have to take their best guesstimate on how much energy expenses might increase and adjust the prices for the coming year accordingly.

We have little control over the energy prices, at least in the short run. If you want to make change happen, it is a lot easier to start with what you have control over. To survive rising energy costs, improve energy management efficiency will be important, but it will be just as critical to better market your business value and your products, communicate with your customers, know your costs and raise your prices to maintain profitability.

(Reprinted from: [Smart Marketing](#), April 2006. "Smart Marketing" is a monthly marketing newsletter for extension publication in local newsletters and for placement in local media. It reviews the elements critical to successful marketing in the food and agricultural industry. Articles are written by faculty members in the Department of Applied Economics and Management at Cornell University.)

Check out the NYSAES Tree Fruit and Berry Pathology web site at:  
[www.nysaes.cornell.edu/pp/extension/tfabp](http://www.nysaes.cornell.edu/pp/extension/tfabp)

Questions or Comments about the New York Berry News?

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**Editor's Note:** We are happy to have you reprint from the NYBN. Please cite the source when reprinting. In addition, we request you send a courtesy [e-mail](#) indicating NYBN volume, issue, and title, and reference citation for the reprint. Thank you.

**WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT  
NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, April 24<sup>th</sup>, 2006**

	Temperature			Growing Degree Days (Base 50)			Precipitation (inches)				
	High	Low	Avg	DFN <sup>1</sup>	Week	YTD <sup>2</sup>	DFN	Week	DFN	YTD	DFN
	<b>Hudson Valley</b>										
Albany	91	35	57	8	50	66	45	0.31	-0.39	2.34	-0.16
Glens Falls	87	31	54	7	39	46	34	0.38	-0.32	2.03	-0.42
Poughkeepsie	89	39	59	10	69	84	52	0.60	-0.25	2.76	-0.10
<b>Mohawk Valley</b>											
Utica	79	34	53	6	34	45	25	1.40	0.56	3.30	0.31
<b>Champlain Valley</b>											
Plattsburgh	82	26	49	3	22	22	8	0.16	-0.54	2.80	0.46
<b>St. Lawrence Valley</b>											
Canton	75	28	51	7	30	32	22	0.07	-0.63	2.36	-0.01
Massena	76	27	51	6	31	31	19	0.15	-0.48	2.11	-0.11
<b>Great Lakes</b>											
Buffalo	76	38	55	8	40	62	42	0.71	0.01	3.38	1.00
Colden	76	38	54	9	34	43	33	0.91	0.03	3.73	0.56
Niagara Falls	73	39	55	7	38	54	30	1.15	0.41	3.44	0.79
Rochester	78	39	54	6	39	56	31	1.16	0.53	3.21	1.04
Watertown	74	30	53	7	35	38	26	0.61	-0.02	2.49	0.41
<b>Central Lakes</b>											
Dansville	78	38	54	7	38	47	25	0.99	0.29	3.74	1.38
Geneva	80	36	53	6	30	41	23	1.23	0.53	4.08	1.65
Honeoye	82	39	56	9	45	57	38	0.92	0.22	4.01	1.55
Ithaca	79	34	54	8	39	48	34	1.10	0.40	3.99	1.57
Penn Yan	78	36	55	8	45	60	42	1.34	0.64	4.09	1.66
Syracuse	80	36	55	7	43	55	32	0.79	0.02	3.29	0.51
Warsaw	77	36	51	8	31	40	33	0.74	-0.07	3.86	1.03
<b>Western Plateau</b>											
Alfred	78	38	55	10	41	50	40	0.98	0.23	3.77	1.17
Elmira	82	33	55	8	50	62	46	0.74	0.11	3.26	1.04
Franklinville	80	35	54	11	40	47	42	0.58	-0.20	3.67	0.93
Sinclairville	79	38	55	10	39	50	41	0.85	-0.06	3.65	0.46
<b>Eastern Plateau</b>											
Binghamton	81	34	54	7	40	58	44	0.69	-0.08	2.64	0.05
Cobleskill	83	31	53	7	36	44	32	0.35	-0.42	2.33	-0.42
Morrisville	76	33	50	5	15	22	13	1.06	0.29	3.50	0.94
Norwich	82	32	55	9	41	49	37	1.07	0.25	3.75	0.96
Oneonta	83	38	57	12	47	55	46	0.92	0.08	3.33	0.47
<b>Coastal</b>											
Bridgehampton	68	41	53	5	24	25	12	0.34	-0.57	8.18	4.86
New York	80	46	60	7	74	106	43	0.15	-0.76	3.33	0.18

1. Departure from Normal

2. Year to Date: Season accumulations are for April 1st to date

The information contained in these weekly releases are obtained from the New York Agricultural Statistics Service (<http://www.nass.usda.gov/ny/>), who in turn obtains information from reports from Cornell Cooperative Extension agents, USDA Farm Service Agency, Agricultural Weather Information Service Inc., the National Weather Service and other knowledgeable persons associated with New York agriculture.