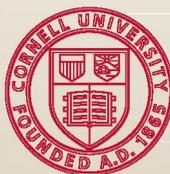


New York State
Integrated Pest Management
Program

The year in review

2011—2012



Cornell University
Cooperative Extension





Directors' Message

Dear Friends,

Sometimes tough times bring out the best in people! Though we're still hurting from budget cuts, our funding and staffing have stabilized—allowing us to focus better on what we do best: reducing the risk of pests and pesticides for all New Yorkers.

Take a look at how we've helped schools deal with pesticide bans, kept growers abreast of breaking pest news, and ramped up our online offerings. And the story on our *Excellence in IPM award* winners reminds us of what great partners we have to work with.

2011 also marked another milestone—Don Rutz's final year as our director. We remember Don for his relentless optimism and bulldog defense of the program, bringing us through severe financial times. Thank you Don!

As we take the helm, we see and are seizing opportunities to restore full funding and reinvigorate our programming, bounded only by our enthusiasm as the future unfolds. The citizens of New York, including growers and other pest management professionals, are asking for safe and effective pest management. *We say, let 'em have it!*

Curt Petzoldt and Jennifer Grant

Our Partners



“For over a quarter century, the New York State Integrated Pest Management Program's partnership with the Department of Agriculture and Markets has protected farmers and consumers alike. We look forward to strengthening this partnership in the years ahead for the betterment of New York's agricultural industry.”

Commissioner Darrel J. Aubertine, New York State Department of Agriculture and Markets



“Our Integrated Pest Management strategy uses a science-based approach to long-term pest control with minimal impact on human health and the environment. If managed properly with IPM, many pests such as weeds, insects, rodents and fungus can be reduced to tolerable levels. The Cornell NYS IPM program promotes this important pest management tool in communities, schools, agriculture and in other settings in New York.”

Commissioner Joe Martens, New York State Department of Environmental Conservation

Front cover: New to our state, invasive fruit flies settle on a perfect raspberry to lay eggs in it. Their name: spotted wing drosophila. Call them *SWD* for short (female on left, male on right). Their larvae all but destroyed eastern New York's late blueberry and fall raspberry harvests in 2011.

Highlights of 2011–2012

Weekly Wake-Up Call

In the 10 years that we've provided our *Weekly Field Crops Pest Report*, we've seen our reach extend from about 5,000 readers in 2001 to more than 27,000 today. It's the "multiplier effect": our Extension and industry recipients find the information so timely—and even urgent—they send it on via their email contacts, newsletters, and even the radio.

Credit is largely due to our Cornell colleagues all around the state—without their observations, where would we be? Each growing season, weekly conference calls with these researchers and educators bring us news statewide of which pests are on the move, and where. In fact, in 2011 alone, we covered 65 insects and diseases—not just pests, but beneficials too—along with all the major weeds and a smattering of *others*: birds, storage pests, flies that plague livestock, and the like.

Project leaders: J. K. Waldron and K. Wise



northern corn leaf blight

Just Call Me *Lepto*:

Leptosphaerulina leaf spot, armyworm, northern corn leaf blight—if you aren't yet acquainted with these and 65-plus other disease and insect pests, we'll provide the introductions. After all, the more you know, the better equipped you are to prevent or remedy the situation.

$$K = (x_1 + x_2)(WV - (x_1 - x_2)) \exp\left(\frac{(-x_3 WV)^z}{z_1 + 1 - z_1}$$

Complicated Formula Simplifies Our Job

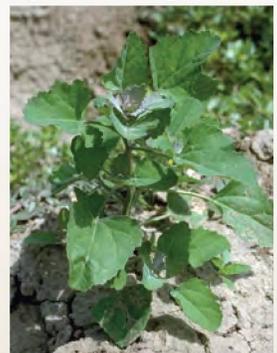
Sophisticated yet simple calculations help farmers predict when pests will most likely show up. Eggs hatch; larvae or nymphs mature; adults emerge to begin the cycle again—all based on *growing degree days*, or GDDs. GDDs measure heat accumulation—the average of high and low temperatures in each 24 hour period, minus the base temp (often 50°F) at which different pests become active. Weather instruments around the Northeast record and compute this timely information and broadcast it to farmers, researchers, and consultants via the Network for Environment and Weather Applications (NEWA)—founded by NYS IPM and now supported in partnership with the Northeast Regional Climate Center and NEWA networks in Vermont, New Jersey, and Massachusetts (newa.cornell.edu).

Yet weeds, along with insects that complete part of their life cycle underground, aren't in the loop. Only a handful of scattered research sites routinely measure soil temperature, and none correlate it to GDDs.

Now Cornell researchers have modified a mathematical model developed at Washington State back in 1985 that used air temperature to predict soil temperature while accounting for factors like soil density, clay content, and heat capacity. The new model closely matches reality, simulating soil temperatures recorded at the New York State Agricultural Experiment Station for the past 11 years, with errors averaging less than one degree Fahrenheit. Next up: building this data into the pest forecasts farmers depend on.

Project leader: A. DeGaetano

Take the Guesswork Out of Guesstimating: GDDs provide reliable forecasts on which pests are up next—unless, like weeds, they spend part of their life cycle underground. Now a new model translates air temperature into soil-temperature forecasts for these hidden pests.



common lambsquarter



Hop to It

Until the 1920s, New York farmers were the world's foremost growers and shippers of brewery hops. Indeed, for decades New York's "International Hop Stock Exchange" controlled prices worldwide. Then downy mildew, a devastating disease, wiped out hopyards throughout the East and Midwest.

Now the Pacific Northwest is the hops capital of the world. But as enthusiasm has surged in local microbrews, so too has surged the interest in homegrown New York hops—and the number of calls we get for help with the inevitable pests. While some growers bring decades of farming experience with them, others have next to none. Which is why, when we offered our Hops 101 and Hops 201 courses, nearly 200 people came. Most importantly, we've established a demonstration and research "bineyard" at Cornell's Lake Erie Research and Extension Laboratory. We want to test which varieties resist pests like downy mildew and other diseases in the humid East and what techniques work best to keep vines healthy and productive the IPM way.

Project leader: T. Weigle

Hops High-Rise: Starting a hopyard? Growers take heed: hops vines are high climbers. They're also perennials. So plant varieties that resist disease, varieties that'll hang in there for the long haul.

Organically Approved

Anthracnose. Blight. Downy mildew. This trio of devastating diseases is really a troupe, an army of bad actors playing differing roles in different crops under differing conditions—and sometimes leaving ravage and ruin in their wake. Dramatic? For sure. Especially when it happens to you. Organic growers do everything they can to prevent and lessen the impact of pests. But when nothing else works, knowing which pesticide treatment usually performs best matters a great deal for organic growers, who have only a handful of fungicides approved for their use.

We tested a total of eight organic fungicides on a trio of high-value crops: tomatoes, zucchini, and cucumbers. Each is especially susceptible to one or more of these diseases. The good news: in each case, at least one fungicide made a big difference in whether and how badly disease hammered each crop. The better news: credible results growers can rely on ([tinyurl.com/org-fungicides](https://www.tinyurl.com/org-fungicides)).

Project leaders: A. Seaman, C. Smart, H. Lange, A. Shelton

Beat the Beetles: Sister trials with organic insecticides found just one formulation—a biopesticide made by fermenting naturally occurring bacteria—that took the bite out of flea beetles, cutting damage by nearly 50 percent.



Fruit, Byte by Byte

Until recently, tree fruit, berry and grape growers searching Cornell's online resources might spend hours clicking from one department's website to the next, even doubling back—or losing track—in Cornell's vast and varied fruit resources. But those days are gone. One site, Cornell Fruit Resources, serves as a portal to all things fruit. Its address? Simplicity itself: www.fruit.cornell.edu

How good is this makeover, really? Consider this Extension educator's assessment: *In terms of importance to my day to day work, I would rank this tool as equal to my car, my cell phone and my laptop computer: A complete necessity.*

Project leaders: J. Carroll, T. Martinson, M. Pritts



If You Test Them They Will Pass

Farmers need innovative, least-toxic ways to solve pest problems old and new. Biological controls, for instance, can take a big bite out of booming pest populations. And the time spent scouting (why spray if pests aren't there?) saves time with the spray rig. Besides, sprays are expensive. Still, time and travel costs make it hard for farmers to get the education and pesticide certification credits they need.

Online courses fit the bill. Since 2010, growers, consultants, and pesticide applicators have taken our Moodle-based courses (moodle.cce.cornell.edu) more than 230 times. This year, IPM staff added four more courses to the 14 already there. The software provides lots of flexibility for us and learners both. Not only can we deliver IPM information in return for certification credits, but we can easily measure results. Perhaps the most gratifying proof of value—test takers stuck with it, sometimes retaking tests they'd already passed to track down the correct answers to the questions they'd missed.

Project leaders: A. Seaman, R. Gardner, T. Weigle, and B. Eshenaur



Make Hay While the Sun Shines: With online courses, farmers can fit earning their education credits into the demands farming puts on their time. Results look good for them and us: final scores average 95%, up 24 points from the pre-test.

In Deep With IPM In-Depth

Dissecting microscope: check. Forceps: check. Salinity meter: check. And don't forget the pest samples or vials of beneficial biocontrols.

With 22.5 million square feet under glass, New York's greenhouse production ranks 5th in the nation, contributing about \$183 million to New York's economy. *And that's just at wholesale prices.*

To keep their industry healthy and strong, greenhouse growers need to know how best to cope with pests the least-toxic way—while saving time and money too. For us, those are three good reasons to pack up the car and take *IPM In-Depth*, our hands-on IPM road show, to where the growers are. After all, 82 percent of learners have never attended similar programming on Cornell's campus, and more than half are completely new to IPM.

Once we cover the basics, like how to use the tools we brought to diagnose and solve problems, the rest is up to growers. What do *they* need? We provide it—while the growers who host us provide the proof of concept that only a commercial operation can.

Project leaders: E. Lamb, B. Eshenaur

Unpacking IPM: Because time is money (and seeing is believing), we bring tools and solutions to busy greenhouse growers—over 250 at last count—and teach them how to put those tools to work.





Lynn Braband

Laurie Mickaliger McBride



Greg Loeb

Meet our Excellence in IPM Award winners

Chuck Mohler is a sought-after speaker anywhere farmers want better ways to manage weeds or make the transition to organic cropping systems. Vegetable specialist **Abby Seaman** coordinates the trap networks and blight forecasts that alert growers when pests are headed their way, while the organic vegetable guidelines she spearheaded have been downloaded over 22,800 times around the world. **Gary Bergstrom's** research partners include the farmers who ground-truth his innovative cultural practices that combat disease problems in wheat, soybeans, corn, alfalfa, and other field crops.



Chuck Mohler

Frank Rossi has spent more than a decade modeling low-impact tactics on high-profile golf courses—tactics that dramatically cut back on the environmental costs of keeping greens *green*.

Entomologist **Greg Loeb** tackles the vineyard and berry pests that grower groups rank as top-priority problems.

Lynn Braband's hands-on workshops reach thousands of people ranging from school nurses to homeowners, grounds crews to custodians in promoting the safest ways to protect people—kids especially—from pests and pesticides both.

Laurie Mickaliger McBride helps greenhouse growers work out the bugs in *biocontrol*: putting the natural enemies of destructive pests to work, which leads to striking reductions in pesticide use.



Frank Rossi

Each year we honor people whose dedication and hard work foster IPM practices new and old: practices that promote a least-toxic approach to reducing the environmental and economic costs of pests and pesticides.

Abby Seaman



Gary Bergstrom



Community

Cut Right to Cut Back



Follow the Rules: set your mower blade to three inches—and keep it sharp. Simple? It works!

Of New York's 3.4 million acres of turf—an area 10 times the size of Connecticut—more than 80 percent is in private lawns. And if you could do just one thing to dramatically cut back on herbicides (millions of dollars' worth get applied each year), it's simply this: before you rev up the mower next time, set your blade at three inches and make sure it's sharp.

That simple? Believe it. Think of each grass blade as a solar panel, streaming energy into the roots. The longer the roots, the stronger the plant—and the greater your lawn's capacity to shrug off drought and disease while outcompeting weeds. Meanwhile, keeping the blade sharp is gentler on plants and can save 25 percent on fuel costs.

Measuring grass is one thing. Measuring how people change is quite another. That's why we're partners in a Northeastern IPM Center working group with the University of Maryland, the United States Botanic Garden, the Smithsonian Institution, Audubon International, and lawn care companies—using surveys and a social media pilot project to evaluate whether the take-home message gets home. And stays there.

Project leaders: J. Gangloff-Kaufmann, M. K. Malinoski

Bare Necessities at Bear Mountain

Two hundred-plus miles of forested, rock-studded trails. Stunning overlooks of the Hudson River gorge (and on a clear day, the skyscrapers of Manhattan 50 miles south). Plus a playfield that welcomes thousands of people a week—and every Wednesday evening, an equivalent tonnage of classic cars.

For the past four years, Bear Mountain State Park has used eco-friendly practices to care for that playfield. How? By taking IPM to the limit, using preventive tactics backed by years of experimentation and experience on athletic fields and high-profile golf courses. Yes, proactively *overseeding* the field to choke out weeds takes time and money. But the old way of doing things—liming, mowing too short, and the occasional fertilizer—cost just as much and left the field weedy and bare. When you consider the benefits to sunbathers and picnickers, to toddlers rolling in the grass—the savings are priceless.

Project leaders: K. Trotta, D. Bourne, J. Grant



Treating Tired Turf? Follow these overseeding ABCs: "A" is for *Aerator tines* that loosen the soil so roots can grow deep and strong. "B" is for *Broadcast grass seed*—not too thick, not too thin. "C"? That's for *See it grow*.

IPM Focus

IPM by the Numbers

They've got pests on their minds; that's why they came. Who's *they*? Landscapers. Professional pest managers. Congressional aides. School nurses. Landlords. Even dog trainers. More than 3,500 people attended our community IPM classes and workshops in 2011.

What did they learn? How to prevent mice, cockroaches, ants, and wasps in schools, offices, and apartment buildings. How to keep lawns and athletic fields healthy and green *without conventional sprays*. The cues bed bugs leave behind, the better to train the dogs that find them.

Each of those 3,500 people has their ear to the ground. Each is connected with scores, hundreds, even thousands of others. Whether they're looking downstream or upstream, teaching or testing, adopting or advancing—the IPM decisions they make or inspire have a ripple effect on the well being of their communities ... and our world. The “ROI”: a *return on investment* money can't buy.

Project leaders: J. Grant, L. Braband, J. Gangloff-Kaufmann



Bowser is Your New Best Friend: We help train the people who train bed-bug sniffing dogs.



No Conventional Pesticides for Your Posies? So far, 114 landscapers are BeGreen-approved through NYS DEC. Who trains them? In large part, us.

Community IPM Focus, continued

Take the Bed Bug Test

True or False?

1. Bed bugs transmit dangerous diseases.
2. Bug bombs are the best way to kill bed bugs.
3. Bed bugs easily infest schools.

Answer key: 1. False. 2. False. 3. False.

Bed bugs are born knowing everything they need to survive and thrive. Once entrenched, they're really hard to get rid of. Their name is an *ick* factor in itself. But bed bugs aren't known to transmit disease, although some people get nasty welts from their bites. And bug bombs are bad news for a bunch of reasons—not least because they could repel bed bugs to the next room through tiny cracks in the wall.

Although schools aren't ideal places for bed bugs to reproduce (they like peace and quiet, and kids just don't sit still), they're transfer hubs for sure. When coats, backpacks, and papers get shuffled together in a closet day after day—well, let's just say these small hitchhikers get around. Since schools are all about learning, we're helping nurses, teachers, custodians, administrators, families—entire school communities—learn the *whys*, *wheres*, and *hows* behind keeping bed bugs at bay. And ace the exam at the end.

Project leaders: J. Gangloff-Kaufmann, L. Braband



Cozy Up With a Good Book:

Bed bugs find creative hiding places, and yes—a book is a cozy hideout. Librarians place returned books in plastic liners, then inspect before shelving them.

It's a Winner: In 2011 a Turkish fir was a New York State Fair grand-prize winner—which meant a Turkish fir had the honor of gracing the Governors Reception Room at the state capitol in Albany on Christmas Day.



Santa's Helpers Root Out Rots

New York's 844 Christmas tree farms contribute \$23 million to New York's economy—7th in sales nationwide. Now the fragrant and beloved Fraser fir, a premium tree native to the Southern Appalachians, is succumbing to *Phytophthora*: a type of root rot that hits hardest while trees are young. Funny thing is, the rot that kills them down south isn't hardy up north. But—it has lots of relatives. And some live here.

Our approach is two-pronged. First: suss out which *Phytophthora* kin infect Frasers in New York, the better to develop preventive tactics. Thus far we've got three likely culprits in the root-rot lineup. Second: seek other lovely fir-family trees that'll survive disease in spots where rot runs rampant. Our test plantings of three fir-clan cousins—Canaan, concolor, and Turkish fir—reveal that seedling Turkish firs have high survival rates when planted in infested soil where Frasers have died.

Project leader: B. Eshenaur



You'll Know It When You See It: Root rot symptoms are stark and unmistakable. Once this killer disease has a toehold, every tree in the neighborhood is at risk. The cure? Prevention.



No news is good news: Cornell and NYS Ag & Markets researchers and their cooperators, on patrol to keep out threats to agriculture, noted 4,800 “no captures” of invasives on the move.



spotted wing drosophila



brown marmorated stink bug

Hiders and Seekers: Scouts also trapped for known baddies new to New York such as the brown marmorated stink bug and spotted wing drosophila—now quickly spreading coast to coast over much of North America.

Time Travel

They ship out from one place to the next however they can, be it in a cargo hold packed with wheat or the baggage in an overhead luggage compartment. For this motley tribe of tiny hitchhikers, the measure of distance is no longer just a factor of miles or kilometers. To invasive pests, the distance from points A to Z can be as short as the time it takes to taxi off the runway in one place and touch down half a world away.

Locally, regionally, globally—invasive pests are ramping up. Farmers have reason for unease: even minus damage, the fear of importing pests can block export from places where scary invasives have debarked.

Researchers and grape growers in New York are part of the USDA’s Cooperative Agriculture Pest Survey. They’ve monitored traps for five moths on the move: the silver Y, light brown apple, European grapevine, false codling, and summer fruit tortrix moths. Grape growers aren’t the only ones to benefit: these pests collectively attack as many as 250 crops and a couple thousand trees, shrubs, and other plants. Where these five are feared, a checkmark in the *no captures* box is a welcome sight.

Project leaders: T. Weigle, H. W. Peterson, A. Wise, T. Martinson, S. Hoying



western bean cutworm, adults



western bean cutworm, larva

Eastward Ho!

Critters that did little damage before agriculture replaced natural ecosystems can prove tough customers when provided easy access to hundreds of thousands of acres of their favorite food. Even so, sometimes such pests are content to stay on their home turf until ... *until*

With the western bean cutworm, a High Plains native, it’s unclear which *until* started its eastward trek, but now it’s on the move. This pest of corn and dry beans is a tricky customer, tough to scout for—especially on beans. Yes, it’s a recent arrival in nearly every ag region in New York, surviving our winters in fine form. No, farmers haven’t seen enough to cause economic damage. Yet. But most likely they will soon. And when they do, we’ll be ready.

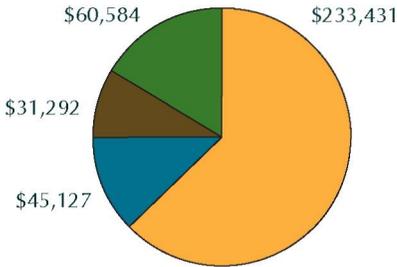
Project leader: J. K. Waldron

Native? Not! Just because a pest is native to North America doesn’t make it native to the Northeast. This moth’s larvae is most easily found on corn. Finding it in bean fields is tricky: eggs are attached deep in the canopy on leaf undersides, and larger larvae hide in the soil during the day.

Distribution of State Funds for the NYS IPM Program

2010–2011

AGRICULTURE

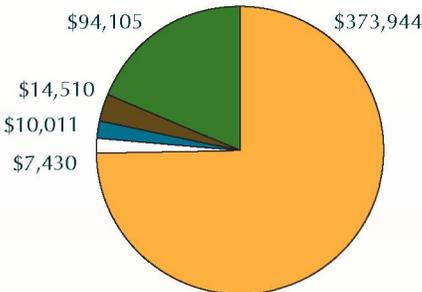


COMMUNITY

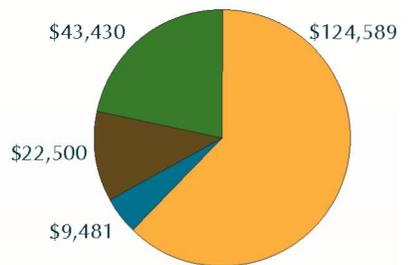
No state Community IPM funds were allocated in 2010-11. State carryover and federal funds allowed us to retain minimal programming.

2011–2012

AGRICULTURE



COMMUNITY



- Implementation, Education and Demonstration
- Development of IPM Strategies and Tactics
- Environmental Monitoring and Pest Forecasting
- Computer/Internet Resources
- Communications

2011 Projects

All projects were partially or fully funded by the New York State IPM Program. We leveraged additional funds from outside sources. Unless otherwise noted, departments listed are part of Cornell University. www.nysipm.cornell.edu/grantspgm/projects/proj11

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IPM Plan for Pesticide Ban. 2011 was a big learning year: a new law meant no more pesticides on lawns and athletic fields at schools statewide. Yet pounding feet beat the soil into a bricklike mass—one favoring weeds and mud while making for slick footing (think scrapes, sprains, even concussions). An unfortunate cycle, but IPM has the answers. Aerating. Overseeding. Giving fields a rest. Fertilizing at the right time, the right way.

Attention to this new law brought more people to our trainings for *all* pests, catching the ears of administrators and school boards statewide. Our workshops reached almost 800 people and many more through webinars and online resources. It's worth it. Protecting children is protecting the most important natural resource we have.

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We develop sustainable ways to manage pests, helping people use methods that minimize environmental, health, and economic risks.