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Ask an Entomologist

Our Insect and Plant Pathology Diagnostic Labs were busier than ever through the pandemic this past year and judging from industry forecasts and recent inquiries it looks like 2021 is shaping up for more of the same. Just in the past week we've received several unusual greenhouse samples, including an somewhat uncommon thrips, an aphid not previously seen in the State, and a yet-to-be-identified geometrid ('inchworm') caterpillar feeding on dried flowers - particularly odd considering the flowers have been bagged and in storage over a year and this group is generally not associated with stored products. Every year we see one or a few insects new to the area and fortunately most are unlikely to have significant impact, though it goes without saying that some introduced pests and pathogens (both plant and animal) obviously can and do. The imminent threat of spotted lanternfly nearby is providing just one entomological case in point. Fortunately we are benefiting from the experience of other entomologists, regulatory staff and growers and each new arrival has been a reminder of the strategic importance of this network of specialists to our industry, the economy, and the environment.

Most experienced growers know or have interacted with an entomologist, but for those new to the business and for students who may be considering a career, an explanation might be helpful. While entomology is a very diverse field encompassing art and science, basic research and applied fields, the following description of the three main areas my work encompasses will serve as an example of what some agricultural extension entomologists do.

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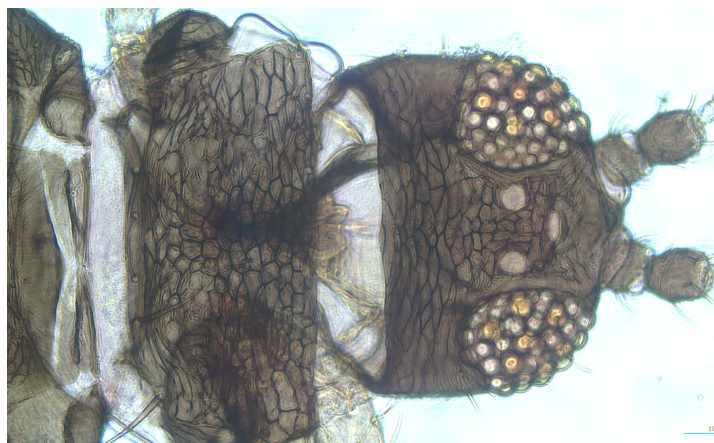
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Our regional insect diagnostic lab identifies insects and plant problems and provides management advice, while watching for anything new or unusual. In a 'normal' year there are 200 - 250 samples mainly from commercial greenhouse, nursery, vegetable and fruit growers, landscape professionals, structural pest managers, parks staff, and others (a separate office handles home garden inquiries). State-level facilities may handle many more. In 2020, however, there were well over 300 submissions, partially due to the pandemic-related surge in business. Most are routine or common problems, often including cultural issues (e.g., overwatering, drought stress, poor drainage, pH and nutrient issues) or chemical injury not directly related to insects or mites, though each year we see one or several new introductions. In recent years there's been a shift to a large proportion of 'samples' submitted electronically, i.e. as smartphone or emailed photos sent directly from the field. This often means handling questions 'on the fly' (no pun intended!). Besides the advantage of a quick reply it screens out common or easily identified issues, eliminating the added time and inconvenience for submitting physical samples. In some years we assist with local surveys, which typically involve placing out insect traps to detect invasive species or assisting with identifying trapped insects. Years of experience and familiarity with local conditions have been extremely valuable for quick recognition; skills have also sharpened thanks to assistance from colleagues and in-service training provided by the National Plant Diagnostic Network. Since some insect groups can be quite difficult to identify - or for second confirmations on new, invasive species - I often turn to the taxonomists who



Head and thorax of poinsettia thrips, *Echinothrips americanus*. The small wrinkles visible in the reticulations are one of the diagnostic features of this insect.



Examining insect samples in the diagnostic lab. Some growers have purchased inexpensive stereoscopes for checking their own samples or assessing biological control shipments.



Elected officials and civic leaders are important supporters of agriculture and can make more informed decisions when included in education and outreach efforts.



Industrial hemp is host to some important insect and disease problems. These symptoms are typical of 'hopperburn' from potato leafhopper infestation.

specialize in these groups. I have great appreciation for these professionals who play a critical role in our defense against damaging pests. Sometimes the need for an accurate identification has led us to entomologists outside the US, who I have found invariably glad to share their time and expertise.

Applied research includes investigating efficacy of new or experimental products, biocontrols, or strategies for managing pests or evaluating existing materials for new problems. There is continuing interest in replacing older chemistries with more selective alternatives, especially those with more favorable environmental (e.g. compatibility with biocontrols) and worker safety profiles. More growers are using and interested in incorporating biological controls, biopesticides and organic-compatible strategies in production and in landscape management. Sometimes growers have difficulty controlling pests and call upon us, assuming insecticide resistance is involved. These situations provide an opportunity to assess what is going on and to compare various treatments. Most often I have found the problem to be a matter of improving spray coverage or selecting a more appropriate alternative. Results from these trials not only provide the basis of recommendations we make that guide growers' investments in time and equipment, but can inform product labeling and special state registrations needed for unlabeled pests. The data generated help growers reduce losses due to pest damage/infestation or plant injury from mis-application. Although we might undertake some studies on our own, most are funded through federal, state, and local partners, such as USDA, the IR-4 Project, Cornell University, NY Dept. of Agriculture and Markets, NY Dept. of Environmental Conservation, as well as in-kind donations and funding from local growers, landscape professionals, trade organizations, foundations and companies interested in evaluating new materials. The work and regular dialog with industry, government, and other entomologists have been essential for guiding change while maintaining a relevant and practical program.

Educational outreach is the third leg of the program. Formal and informal presentations, field visits; email; in-person, phone and on-line (Zoom, e.g.) meetings; articles; newsletters; and websites are ways information is shared with growers, gardeners, civic groups, other entomologists, agriculture departments, etc.. Communication goes both ways of course; ideas for projects or solutions often come directly from producers and we learn from others just how effective or practical our recommendations really have been, or about solutions they may have discovered. Our organization maintains an advisory board of growers, landscape professionals, and home gardening representatives who provide input on changes to our programs or areas to address. We also continually engage with elected officials to keep them informed about our activities and responses to local issues, while helping them and their constituents better understand and appreciate agriculture.



This small wasp (*Tetrastichus sertifer*) is parasitizing a lily leaf beetle larva. Some entomologists assess and introduce new biocontrols to help manage invasive species.

e-GRO Alert

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