As crop indicators, weeds spread in warmer world

November 8 2013, by Blaine Friedlander

(Phys.org) —Weeds, those unwanted, unloved and annoying invasive plants that farmers and gardeners hate amid their plantings, are expanding to northern latitudes, thanks to rising temperatures.

"Weeds are the wild relatives of many of our crops," says Antonio DiTommaso, a weed ecologist and Cornell associate professor in the Department of Crop and Soil Sciences. "Weeds will be the harbingers of global warming. They'll tell us what kind of species of crops will likely survive in a changing climate."

Impending climate change will bring different crops to different regions, he says. Many weeds already have expanded their latitudinal ranges – or will do so – based on climatic pressures, he says. For example, johnsongrass and velvetleaf have migrated from more southern U.S. climes through Pennsylvania and New York.

"During this period, many invasive plant populations are likely to be developing adaptations that could lead to exponential population growth in the near future," says DiTommaso.

But to be able to accurately identify weeds in the crop fields and advise farmers on how to best manage invasive plants, North American agriculture needs more weed scientists, he stresses. Cornell – and other land-grant universities – respond by providing access to weed science courses and recruiting undergraduate and graduate students to take up the cause.

DiTommaso's popular Weed Biology and Management undergraduate course (CSS 3150) focuses on weeds of the northeastern United States and southern Canada, offering hands-on sessions and field trips. Students are exposed to the breadth of the weed science discipline from learning to identify these "plants out of place" to understanding their biology and ecology and, ultimately, to learn strategies for managing them using non-chemical and chemical approaches. One special feature of the course is that students are required to assemble their own personal weed identification guide that covers more than 90 weedy and invasive species .

Leaving the classroom behind, students saunter through the Cornell Weed Garden, which sits on a large plot behind the Muenscher Laboratory greenhouses. The garden – rife with wild parsnip, poison hemlock, yellow nutsedge, common ragweed and field horsetail – features about 80 common weeds in the Northeast.

Says DiTommaso: "Rather than just learn in a classroom or from a textbook, they can appreciate and see firsthand the diversity, the shapes, sizes, characteristics – so that one day they can use this knowledge to better manage these troublesome plants."

Provided by Cornell University