

## Good Bugs, Bad Bugs, & Garden Management: 2011 Research Update

In 2011, “Team Bug” worked with NYC gardens to learn how different plantings and gardening practices affect pest insects and beneficial insects. Our goal is to learn how gardeners can reduce insect damage on vegetables, by encouraging beneficial insects and using other environmentally-friendly practices.

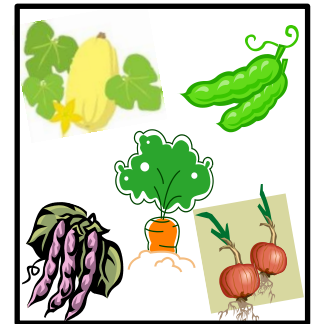
### Ecological Insect Management: What Gardeners Can Do!

Here’s our top five suggestions for encouraging beneficial insects and reducing insect damage, based on our results so far. For more details about specific pests and beneficial insects, please see the opposite side.

1. **Use row cover early in the season**, to protect seedlings from aphids
2. **Increase floral, tree, and shrub plantings** (especially perennials) to provide food and habitat for beneficial insects
3. **Increase the diversity of agricultural crops**, especially those that aren’t susceptible to key pests
4. **Control weeds that shelter pests**, especially weeds in the Brassica family (for example: Shepherd’s purse and yellow rocket).
5. **Advocate for larger garden spaces**, which may support more beneficial insects.



Photo: gardening.cornell.edu



### Contact Information

For more information and updates, please visit the website of the Garden Ecology Project:

<http://blogs.cornell.edu/gep/>

Or contact us with ideas and questions for further work:

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## Results and Management Recommendations: Pest Insects

Here's what we're learning about when pests are most problematic, which garden characteristics and practices influence how severe they are, and what gardeners can do to decrease pest damage.

Pest Insect	Peak Activity	Predictors	Management Options
<b>Pests of Brassica Crops</b> (bok choy, broccoli, cabbage, collards, kale)			
<b>Aphids</b>	Early August & Early September	↑ with % <b>Canopy Cover</b> ↑ with <b>Light</b>	<ul style="list-style-type: none"> <li>Monitor aphids on garden trees with yellow pan traps</li> <li>Apply soap spray to Brassica leaves</li> </ul>
<b>Whiteflies</b>	August - September	None	<ul style="list-style-type: none"> <li>Clean transplants</li> <li>Apply soap spray to Brassica leaves</li> </ul>
<b>Flea Beetles</b>	Late July	↑ with <b>Total Area</b> ↑ with % <b>Floral Area</b> ↓ with <b>Crop Diversity</b>	<ul style="list-style-type: none"> <li>Increase diversity of agricultural crops</li> <li>Control Brassica weeds (e.g., shepherd's purse, yellow rocket), especially in common floral areas</li> </ul>
<b>Pests of Cucurbit Crops</b> (cucumbers, melons, summer and winter squash)			
<b>Aphids</b>	June	↑ with % <b>Vegetable Crop Area</b>	<ul style="list-style-type: none"> <li>Use row cover early in the season</li> <li>Increase floral, tree, &amp; shrub area, esp. perennials</li> </ul>
<b>Squash Bugs</b>	Late July – Late August	↑ with <b>Garden Size</b> ↑ with % <b>Vegetable Crop Area</b>	<ul style="list-style-type: none"> <li>Hand-pick egg masses on leaves in early to mid-July</li> <li>Increase floral, tree, &amp; shrub area, especially perennials</li> </ul>
<b>Pests of Tomatoes</b>			
<b>2-Spotted Spider Mites</b>	Early August – Early September	↓ with % <b>Canopy Cover</b> ↓ with % <b>Floral Area</b>	<ul style="list-style-type: none"> <li>Increase floral area</li> </ul>

## Results and Management Recommendations: Beneficial Insects

There are a number of insects that can benefit gardeners by eating or parasitizing pest insects – like parasitic wasps, pirate bugs, spiders, and the larvae of ladybugs, syrphid flies, and lacewings. Here's what we're learning about which garden characteristics and practices seem to encourage these “beneficials”.

Crop	Predictors for Beneficials	Management Options
<b>Brassicas</b>	May ↑ with Crop Diversity	<ul style="list-style-type: none"> <li>Short term: Increase floral plantings</li> <li>Long term: Advocate for larger garden spaces</li> </ul>
<b>Cucurbits</b>	↑ with <b>Total Area</b> , % <b>Floral Area</b> , and <b>Light</b>	
<b>Tomatoes</b>	May ↑ with Total Area	
<b>Minute Pirate Bugs</b>	↑ with <b>Total Area</b> on all crops ↑ with % <b>Floral Area</b> on cucurbits & tomatoes	