

Bug of the Month

by Jim Revell / April 2015

Insect Migration: *Where do bugs go for the winter?*

We are familiar with birds that migrate such as Canadian Geese and Red Tail Hawks, and mammals such as Cariboo and the American Buffalo, and you may be familiar with the migration of the Monarch Butterfly.

Sherry and I had the opportunity to watch a PBS special on the **Monarch Butterfly** on Wednesday night, March 18th – a very informative and interesting program. One experiment that I found most interesting was where researchers physically relocated Monarchs from Kansas to Washington, D.C. and released them. Monarchs migrate from southern Canada to Mexico and, of course, you can't get to Mexico going directly south from Washington, D.C.

What the researchers found was that after going due south out of D.C., for several days, the butterflies turned in a southwestern direction and proceeded through Texas, arriving in Mexico as planned. This is considered “**homeostatic**” migration, i.e., where migrants or offspring return to breeding areas using innate navigational skills. The Monarchs migrate to their overwintering sites in central Mexico, spending about five months there; come Spring, the surviving few, along with several new generations, begin the return to their Summer homes as far north as southern Canada.

Other insects head south, also, but it is a different generation that returns. The **Leafhopper** and **Milkweed Bugs** do this. Most insects, however, have ways of staying in place year-round, many of which we are well aware of (too well aware of!) such as the Marmorated Stink Bug – they prefer to overwinter with us in our homes and outbuildings! The insects that remain year-round have mechanisms such as “body antifreeze,” hibernation in cocoons, or other methods of finding protected areas for eggs and larva stages. Japanese Beetles are a good example where the grubs burrow deeper and rise as the soil warms in late Spring to early Summer.

A determining factor in the majority of insect migrations is weather. Using prevailing winds, thermal currents and weather fronts, their journeys can be perilous. Their movements are usually confined to lower altitudes (spanning about two kilometers, or 1.24 miles, of the lowest atmosphere). Glider pilots have reported Monarch Butterflies at an altitude of 1,200 meters (3/4 of a mile).

Limited research of migrating insects shows they appear to have well-defined destinations which require strong navigational tools and orientation. Day-flying insects primarily make use of the sun for orientation; in doing so, they must compensate for the sun's movement. Polarized light waves enable them to do this as the light waves create a pattern in the sky that stays the same as the sun moves across the sky. Insects are able to use the pattern of polarized light to hold their path and orientation; even on cloudy days, they can tell the position of the sun based on the pattern of polarized light.

In nocturnal insects, it is felt magnetic fields may be used by short-distance fliers. Further research is needed in this area. The migrations of butterflies and moths have been studied the most, with migration of the Monarch butterfly one of the most well-known.

Other orders of insects that have migrating members are Orthoptera (Short-horned Grasshopper, Rocky Mountain Locust); Odonata (Common Green Darner Dragonfly); and Coleoptera (Convergent Ladybird Beetle). Migration in insects is more a directional movement and cyclical in nature, with exact reasons unclear.

Many migrating insects are considered pests in our gardens, i.e., the **Diamondback Moth**, for one (see photo in the Gallery below). Its larva stage is a noted defoliator of cruciferous plants (cabbage, broccoli)

Some Migratory Insects impacting Virginia:

Armyworm
Black Cutworm
Cabbage Looper
Cabbage White
Corn Earworm
Diamondback Moth
Large Milkweed Bug
Potato Leafhopper
Spotted Cucumber Beetle

in gardens across many parts of the world. Migration of this insect is well studied in England. The migrating Diamondback Moth covers a distance of over 3,000 km or in excess of 1,864 miles. Here in the United States, the Diamondback Moth overwinters as an adult in warmer climates. Though a weak flier, it is known to migrate long distances.

Here are a few others considered to be “migrating” insects (see photos in the Gallery below); you may have experienced some of these insects in your garden:

Cabbage Looper: Moths travel south, returning north on storm fronts. Some may overwinter in the Mid-Atlantic area as pupae.

Black Cutworm: Most spend the winter as pupae or adults along the Gulf Coast and migrate northward on leading edges of cold fronts.

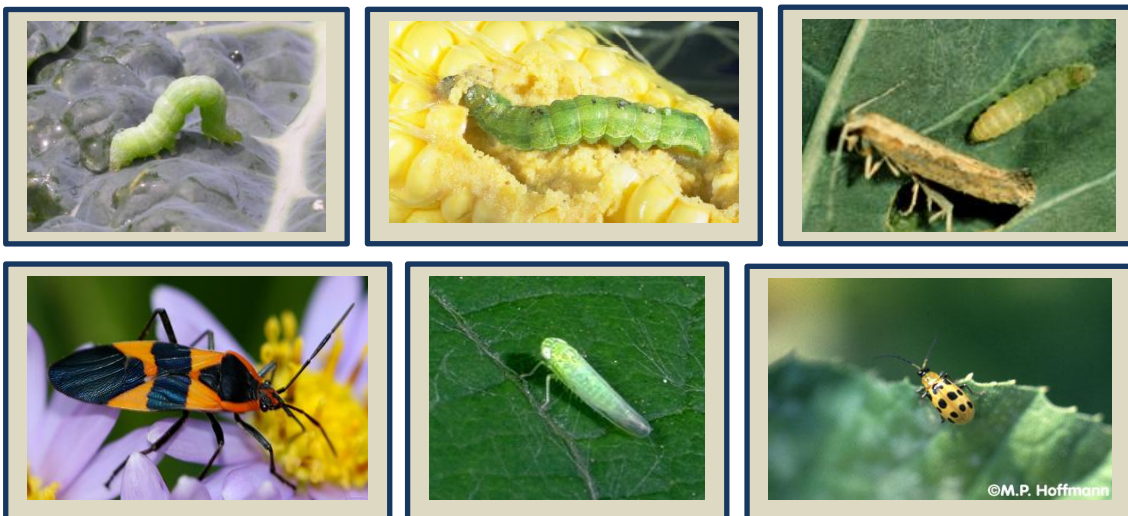
Spotted Cucumber Beetle: They overwinter in southern states, moving north as temperatures warm and food sources are planted.

Migrating “south” might be something Sherry and I will consider if next February turns out like this last one!!! SPRING IS HERE! Happy Gardening Everyone!

Gallery of some migrating insects we experience in Virginia:



Clockwise from top L: Armyworm Larva, Black Cutworm Larva, Black Cutworm Moth, Cabbage White Larva, Cabbage White Butterfly, Armyworm Adult Moth



Clockwise from top L: Cabbage Looper, Corn Earworm, Diamondback Larva & Adult Moth, Spotted Cucumber Beetle, Potato Leafhopper, Large Milkweed Bug

Photo References / Resources:

Armyworm Larva: www.nwroc.umn.edu/Cropping_Issues/2012/June_26/Armyworm/index-htm
Armyworm Adult Moth: citybugs.tamu.edu/factsheets/landscape/lawns/ent-1007
Black Cutworm Larva (photo by J. Obermeyer): extension.entm.purdue.edu/fieldcropsipm/insects/black-cutworms.php
Black Cutworm Adult Moth (photo by J. Obermeyer): extension.entm.purdue.edu/fieldcropsipm/insects/black-cutworms.php
Cabbage Looper: www.missouribotanicalgarden.org/gardens-gardening/your-garden/help-for-the-home-gardener/advice-tips-resources/pests-and-problems/insects/caterpillars/cabbage-looper.aspx
Cabbage White Larva (photo by Jay Cossey; www.images.on.ca/JayC/):
www.fcps.edu/islandcreekes/ecology/cabbage_white.htm
Cabbage White Butterfly (photo by Dr. Ahmet Baytas): www.fcps.edu/islandcreekes/ecology/cabbage_white.htm
Corn Earworm: www2.ca.uky.edu/entomology/entfacts/ef318.asp
Diamondback Larva & Adult Moth: hort.uwex.edu/articles/diamondback-moth
Large Milkweed Bug: sites.biology.duke.edu/dukeinsects/Oncopeltus_fasciatus.php
Potato Leafhopper: www2.ca.uky.edu/entomology/entfacts/ef115.asp
Spotted Cucumber Beetle (photo by M.P. Hoffmann, Cornell University):
vegetablemendonline.ppath.cornell.edu/PhotoPages/Cucurbit/CucBeetles/BeetlesFS2.htm

Research References / Resources:

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“How and Why Do Insects Migrate?” by Richard A. Holland, et al. www.sciencemag.org/content/313/5788/794.abstract
“The Migration of Diamondback Moth” by Yau-I Chu, Department of Plant Pathology and Entomology, National Taiwan University: web.entomology.cornell.edu/shelton/diamondback-moth/pdf/85papers/1985DBM08.pdf
“Animal Migration: Facts / Going Places – Migration,” idahoptv.org/ScienceTrek/topics/animal_migration/facts.cfm
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<http://bugguide.net/node/view/3259?printable=1>
<http://ento.psu.edu/extension/factsheets/corn-earworm>
<http://ento.psu.edu/extension/factsheets/diamondback-moth>
<http://extension.umd.edu/print/1478>

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Read more of his articles on the “Jims Bugs” page @ www.BedfordMasterGardeners.org