United States Department of Agriculture

Supporting Pollinators in Production Agriculture: Small Adjustments = Big Impacts

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What's the problem?

A recent examination of Presidential Memoranda posted on the White House website reveals a variety of topics that include: providing assistance to other countries to support counterterrorism efforts, enhancing workplace flexibility for Americans, and promoting the health of….honey bees and other pollinators. When did pollinators become important enough to warrant presidential recognition? In fact, the President assembled a Pollinator Health Task Force that includes the Department of Defense!

Figure 1 A bumble bee visits a wild bergamot flower (USDA photo)

European honey bees and native bees are largely responsible for ensuring the successful fruit set of certain specialty crops that cannot set fruit without pollination (e.g., watermelon, cantaloupe, zucchini, almond, and blueberry). The problem is, as the President mentioned in his official memorandum on June 20, 2014, populations of European honey bees have sharply declined in recent years.

Why does it matter for Arkansas?

Pollinators are both directly indirectly important in Arkansas agriculture and ecology. Providing adequate habitat for native bees and European honeybees is important to maintaining and increasing watermelon crop yield in the state. For example, the USDA-National Agricultural Statistics Service estimates that watermelon yield per acre in Arkansas declined by 21% from 2012 to 2013.

Figure 2 A squash bee visits a squash flower (Photo by Anne Stine, used with permission)

Watermelon flowers must be pollinated to produce a fruit. Since flowers only stay open for one day, a good watermelon crop is directly correlated with bees that can deliver enough pollen during a short amount of time. Evidence shows that squash bees and bumblebees (both native bees that nest in bare soil) are actually more efficient watermelon pollinators than European honey bees because they deliver more pollen per visit (Kremen et al.). Supporting pollinator habitat in Arkansas is also important to maintain migratory corridors for other pollinator species like the Monarch butterfly and the Diana fritillary (the Arkansas state butterfly).

Did you know?
Bees must transfer at least 500—1000 pollen grains from a male to a female watermelon flower to ensure successful fruit set and prevent misshapen melons (Kremen et al).

How can Arkansas agricultural producers support pollinators?

Supporting pollinators can be accomplished by making small adjustments to existing production strategies to provide year-round sources of nectar and pollen, nesting sites, and protection from chemicals. For example:

- Cover crops: include a flowering species with value to pollinator species in a mix or plant alone (e.g., phacelia, crimson clover, hairy vetch, buckwheat, or mustards).
- Pesticide application timing: spray herbicides and insecticides in late evening if possible to minimize the impact on bees because they are more active during the day time.
- Choose a pollinator headquarters: avoid spraying chemicals here if possible and leave wood piles for nesting (e.g., unproductive or non-accessible areas or in field corners or borders).

Figure 3 Crimson clover cover crops can provide a food source for pollinators while improving soil quality (USDA photo)

There are financial assistance opportunities available from the Natural Resources Conservation Service, the Farm Services Agency, and the Arkansas Game and Fish Commission to establish and maintain pollinator habitat areas. Basic guidelines include:

- Plant 9 flowering species in a seed mix with 3 species blooming in the spring, 3 in the summer, and 3 in the fall.
- Plant square blocks rather than strips as bees exhibit flower constancy. This means each bee is committed to pollinating as many flowers of that same species in one day as possible (a flower monogamist!). Square plantings decrease the distance bees need to fly compared to strips and increase pollination efficiency.
- Create small areas of bare ground for nesting sites for native bees (maintain with shallow tillage <1 ft deep)

Figure 4 Purple coneflower and black-eyed susans bloom in the Booneville Plant Materials Center plots in May (USDA photo)

These guidelines apply for backyard gardens and for large-scale farming operations.

Large gains in improving habitat for beneficial pollinators can be achieved using current technology—no Department of Defense needed. Arkansas agricultural producers have a history of protecting the natural resources that sustain indefinite and profitable production on their farms, and supporting Arkansas native pollinators is just one more way to continue that proud legacy.

Figure 5 Showy evening primrose, white beardtongue, and purple coneflower burst into bloom in May at the Booneville PMC (USDA photo)

Selected references:

Kremen, C., N. Williams, S. Greenleaf, and R. Thorp. Native bee pollination of watermelon. Xerces Society for InvertebrateConservation.http://www.xerces.org/wpcontent/uploads/2008/10/factsheet_watermelon_pollination.pdf. Accessed 12 August 2014.

USDA-National Agricultural Statistics Service Delta Regional Office: Arkansas. 2014. Watermelons: acreage, yield, production, price, and value. http://www.nass.usda.gov/Statistics_by_State/Arkansas/Publications/Crop_Releases/Fruit_Nut_Vegetable/2014/frveg14.pdf. Accessed 12 August 2014.

Andersen, C.R. 2012. Watermelons, FSA6012. University of Arkansas Cooperative Extension Service. http://www.uaex.edu/publications/pdf/fsa-6012.pdf. Accessed 12 August 2014.

Office of the United States Press Secretary. 2014. Creating a federal strategy to promote the health of honey bees and other pollinators. Presidential memorandum. http://www.whitehouse.gov/the-press-office/2014/06/20/presidential-memorandum-creating-federal-strategy-promote-health-honey-b. Accessed 12 August 2014.

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