

Studying droplet sizes to combat corn earworm

Agricultural Research Service (ARS) scientists have taken to the skies to combat corn earworm and help make U.S. sweet corn more visually appealing.

Bradley Fritz, an agricultural engineer at the Southern Plains Agricultural Research Center in College Station, Texas, found in an aerial study that spray rates and droplet sizes can make a big difference in whether insecticides that control corn earworms are reaching the target.

The sweet corn grown in the United States is sold as a fresh market product, so to attract a buyer it needs to be visually appealing. Corn earworms can devastate both crop yields and the appearance of the ear. Some growers will conduct aerial spraying operations as often as once every four days to control corn earworms.

Adult corn earworm moths lay their eggs on corn silks, and on leaves, husks and stems near the silks. After the eggs hatch, the larvae travel along the silks to feed on kernels where they remain protected by the husks. To be effective, the insecticides must penetrate the plant canopy and reach the silks where the larvae begin feeding soon after hatching.

Fritz and his ARS colleagues sprayed test plots three times with insecticides approved for organic operations and then collected silks from ears of corn growing on the plots to assess how much spray actually reached



the targeted silks. He sprayed some plots with 400-micron droplets and some with 220-micron droplets. The insecticides were mixed with water at label—recommended levels and sprayed at rates of either 5 gallons or 9 gallons per acre.

The results, published in the *International Agricultural Engineering Journal*, (<http://www.cigrjournal.org/index.php>) showed that higher spray rates with larger droplets worked best to ensure the insecticide reached the targeted corn silks. The results will guide future corn earworm spraying operations, and the methods may be used in future studies of spray rates for other crops and pests.