

Weed Control in Pepper and Sweet Corn - 2003
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Two experiments were conducted in 2003 to test labeled and experimental herbicides on pepper and sweet corn. The experimental herbicides are not labeled yet and must not be used as this is against federal law. The purpose of trying new and experimental herbicides is to collect data to support their registration, in the case they performed well.

Materials and Methods

The weed control experiments were conducted at the University of Kentucky Research and Education Center (UKREC) in Princeton, KY. The experimental design used for both experiments was a randomized complete block design with 3 replications. Prior to planting, lime and fertilizer were amended per soil test recommendations. A final soil workup was performed prior to planting to level plow ridges and to break up soil clods.

Pepper: Plot size was 6 ft wide by 35 ft long. Raised beds, 6" high, were shaped and drip-irrigation installed using a plastic layer. No plastic was laid for this experiment since bareground was essential to test the effectiveness of the herbicides tested. Once all the herbicide treatments were applied, 2 rows of peppers, one for Olympus and one for Wizard varieties, were hand-transplanted on May 22, 2003, at 2 ft spacing within rows. This is equivalent to 17 plants for each variety per bed/treatment. Herbicide treatments were applied using a 4 8002-nozzle boom backpack sprayer set at 30 psi and 20 GPA with a 5.3 ft spray swath width. For the preplant incorporated treatments, a garden rake was used to manually incorporate the herbicides on the sprayed beds. The postemergence treatments were applied on July 9, 2003, or 69 days after transplanting when plants were about 12" tall. Of all the herbicides used, only Sencor and Matrix are not currently registered for use on pepper.

Sweet corn: Plot size was 6.5 ft wide by 80 ft long. Ten sh2 sweet corn varieties were seeded on April 22, 2003, using a John Deere plate seeder at 9" spacing. Three varieties had yellow kernels (Summer Sweet 6800 Y, AC945 Y, and Saturn Y). Four varieties had bicolor kernels (Summer Sweet 6802R BC, Camas BC, Saturn BC, and Summer Sweet 8102R BC). Three varieties had white kernels (Boreal W, Saturn W, and 8101R W). The herbicide treatments were applied perpendicular to the seeded corn, in order to test the effect of herbicide treatments on each variety. The preemergence herbicide treatments were applied on May 15, 2003, and the postemergence treatments were applied on June 18, 2003. All sprays were applied using a 2 8002-nozzle boom backpack sprayer set at 30 psi and 20 GPA with a spray swath width of 3.3 ft. The herbicide treatments were 3.3 ft wide and ran across all 3 replications. With sweet corn seeded at 9" spacing, there's about 4.3 seeds in the 3.3 ft herbicide band. Of the herbicides used in this experiment, Axiom, Callisto, Option, and Lumax are experimental herbicides and their labels specifically ban their use in sweet corn.

For both experiments, weed control effectiveness were determined by a visual injury ratings using a scale of 1 – 10, with 1 equivalent to no injury or similar to the control plot, and 10 equivalent to complete kill or none present.

The following are abbreviations used in the tables below: DAT = days after treatment; PPI = preplant incorporated; PRT = pre-transplant; POT = post-transplant; PO1 = postemergence; EBNS = eastern black nightshade; LACG = large crabgrass; ILMG = Ivy leaf morningglory; JG = Johnsongrass; HVMW = honeyvine milkweed; CAWE = carpetweed, COPU = common purslane; COCO = common cocklebur.

Results and Discussion

Pepper:

Table 1 includes the visual injury ratings of pepper and weeds present taken at 20 DAT. Both pepper varieties showed little or no herbicide injury with all treatments, except treatment 2 which included Sencor 0.5 PPI. As mentioned above, Sencor is not currently labeled and the observed injury explains why. Matrix was the other experimental herbicide and showed little or no injury when applied PRE or POT. All treatments showed excellent levels of weed control, when compared to the level of weeds present in control plots. Table 1 also includes the visual injury ratings of pepper and weeds present, taken at 47 DAT or 2 days before postemergence treatments were applied. Sencor 0.5 PPI continued to show injury on both pepper varieties. Treflan 1 PPI and Dual Magnum 1.33 POT were the safest treatments on peppers. Treflan still had good control of Johnsongrass and large crabgrass, but was weak on honeyvine milkweed and carpetweed, and had no control of eastern black nightshade. The low rating values of Treflan on eastern black nightshade, at 47 DAT, must be attributed to a new flush of emerged weeds. Dual Magnum applied POT, had the equivalent of 80% control of eastern black nightshade at 47 DAT, but lost its effectiveness on carpetweed.

At 47 DAT, Matrix 0.031 PRT resulted in a severe injury, at least 60% reduction in plant vigor and height on both pepper varieties. This injury was not noticed at the first evaluation on 20 DAT. Matrix appears to be very effective in its control of Johnsongrass and carpetweed but had little effect on eastern black nightshade.

Table 2 lists the cumulative yields of three harvests of both varieties. The effects of postemergence treatments can be found in table 2. Injury in peppers observed with Sencor PPI and Matrix PRT is very evident in the total number and weight of peppers harvested. Matrix PRT resulted in an average of 13 and 17 fruits per plot, equal to about 1 fruit per plant, compared to 37 and 54 fruits in the control plots. Matrix POT appears to be very safe on peppers and resulted in the highest yields for Olympus and 3rd highest for Wizard. Matrix POT also resulted in yields better than Treflan PPI or Dual Magnum POT applied alone. Treflan PPI followed by Command PRT gave the highest yields in Olympus pepper, whereas Dual Magnum POT gave the highest yields in Wizard pepper.