

The Search For New Melon Herbicides

W. Thomas Lanini

Department of Plant Sciences, U.C. Davis

Weed control in melons is difficult due to the limited availability of registered herbicides. Field trials over the past five years have examined a range of herbicides for potential melon tolerance and weed control. The herbicides evaluated included Lorox, Dual Magnum, Château, Prowl H₂O, Zeus (also called Spartan), Reflex, Matrix, Sandea, and Command (granular form is Cerano). Two cantaloupe varieties (Esteem and Oro Rico), a honeydew melon (Saturno) and a watermelon variety (Paradise 2008-2011, Charleston Grey 2012) were tested for tolerance and weed control with these herbicides. Herbicide applications were made after planting, but prior to crop emergence and incorporated with sprinkler irrigation (0.5 to 0.75 inches) in some years or with a shallow mechanical incorporation in other years.

Melon stand was measured for each variety during the establishment period, followed by melon vigor ratings made later in the season. Melon vigor was visually assessed (0 to 10 scale, with 0 = no melons, and 10 = good melon stand and growth), in each plot, noting chlorosis, leaf abnormalities, and any reduction in stand, growth or vigor. Weed control by species was visually assessed (0 to 100 scale, with 0 = no control). Mature marketable melons were harvested (1 to 7 times), counted and weighed for each plot.

Mechanical incorporation appeared to be safer than sprinkler incorporation for most of the herbicides tested. Sprinkler incorporation often resulted in greater reductions in melon stand, and loss of early season vigor. Sprinkler irrigation likely allowed the herbicides to move deeper into the soil profile than mechanical incorporation, and thus the loss of stand and the reduction of growth. Weed control with Chateau and Reflex was also compromised by mechanical incorporation, as these herbicides are similar to Goal, in that mechanical incorporation dilutes the herbicide concentration at the soil surface and reduces weed control. Mechanical incorporation also seemed to lower weed density. This may have been due to the mechanical incorporation, killing any weeds that had emerged or were near the soil surface and about to emerge. Additionally, watermelon is far more tolerant of herbicides than honeydew melon. Cantaloupe is the least tolerant of herbicides among the melon types tested.

Overall weed control was good in most years with Zeus, Dual Magnum, Matrix or Sandea treatments. Sandea is currently labeled for melons and in numerous trials, has provided excellent, broad-spectrum weed control when applied preemergence, but only seems to control nutsedge when applied postemergence. Prowl H₂O was highly effective against the grass weeds in this trial, but weaker on pigweed or purslane in some years. Zeus was generally among the best of the experimental herbicides in terms of broadleaf weed control and duration of weed control, but weak on grasses. However, Zeus often caused some stand loss and reduction in early season vigor. Mechanical incorporation of Zeus appeared to reduce injury to melons with no loss of weed control.

Dual Magnum appeared to be safe on melons, regardless of the method of incorporation. Weed control was good in all years but best in the years where sprinkler incorporation was used. Among the treatments, Dual Magnum was easily the best in terms of yellow nutsedge control.

Command is registered in all states other than California for weed control in cucurbits. In preliminary trials, rates were very low and weed control was poor. In the past two years, rates have been increased and weed control has been very good to excellent, with the exception of pigweed, which has been only moderately controlled by Command. Matrix appeared safe on melons and weed control was very good, however, DuPont was not willing to support this registration in California, and thus was only included in one of the past five years of study.

FMC, makers of both Zeus and Command, is currently moving forward to register these products in melons in California.

Melon yields have been closely related to melon tolerance and weed control, with higher yields where little or no injury occurred, and where most weeds have been controlled. Cantaloupe yields were highest with Zeus in most years, in spite of some early season injury, indicating that weed control was more important than early season melon tolerance in terms of yield.