

Herbicide Control of Nightshade and Nutsedge in Processing and Fresh Market Tomatoes

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Introduction

Yellow nutsedge (*Cyperus esculentus*) and nightshade (both black and hairy, *Solanum nigrum* and *S. sarrachoides*) are two dominant weed problems for tomato growers in Merced and Madera Counties. One of the available herbicides for both of these weeds is metalochlor (Dual Magnum), which received late registration in 2003. While there are a few other herbicides registered to control these weeds, two relatively new chemicals that target these species specifically are rimsulfuron (formerly Shadeout, now marketed under the trade name Matrix) and halosulfuron-methyl (trade name Sandea). Post emergent sprays of Matrix target nightshades, whereas Sandea is almost exclusively a nutsedge herbicide. Efficacy for both is improved through the use of a non-ionic surfactant or crop oil concentrate. Furthermore, tank-mixes of Sandea + Matrix have given exceptionally good weed control of both nutsedge and nightshades.

One disadvantage with Sandea is potential crop phytotoxicity, especially with certain varieties. This sensitivity is exacerbated with the addition of Matrix. In trials on processing tomatoes in 2004, certain varieties showed up to 80% phytotoxicity symptoms with a Sandea + Matrix combination. Yields were not significantly affected, but fruit quality was not evaluated.

In 2005, eight fresh market tomato varieties were screened for sensitivity to various post-application herbicides. In processing tomatoes, nightshade and nutsedge control were evaluated with several different pre and post application materials. In both locations, the standard herbicide was Dual Magnum. The objective of these trials was to compare efficacy and crop sensitivity to various herbicides that suppress nutsedge and nightshade in tomatoes.

Procedure

The trials were located in commercial production fields near Gustine (fresh market) and Firebaugh (processing). Plots were furrow irrigated and managed similarly as the rest of the field with the exception that mechanical cultivation and hand weeding were not performed. At the Firebaugh location, the pre-plant herbicides were incorporated with sprinklers, whereas at the Gustine site Dual Magnum was incorporated with a disc. Post emergent herbicides were applied over-the-top when the crop was near first bloom. Following herbicide application, plots were evaluated for weed control on a 0 to 10 scale, where 0 = no weed growth and 10 would indicate complete weed coverage.

Results

At the Gustine location, Dual Magnum, Sandea, and a tank-mix of Sandea + Matrix did the best job controlling nutsedge, especially by the latest evaluation date on July 18 (Figure 1). In Figure 1, herbicide pressure is shown as percentage, though the statistical analysis was performed on the transformed data (0 to 10 scale). At this time, all herbicide treatments provided significantly better control of both nutsedge and broadleaf weeds than the untreated check plots.

Sencor did not perform as well as the other herbicides on controlling nutsedge, but did significantly reduce broadleaf weeds as compared to the untreated control.

The main weeds in this trial were purslane (*Portulaca oleracea*) and yellow nutsedge, and as a result Matrix alone had significant less nutsedge control than Sandea, Dual, or Sandea + Matrix (Matrix post emergent is predominantly a nightshade control material). Matrix did significantly reduce purslane as compared to the untreated control. Dual Magnum, however, did not suppress purslane as well as the other weeds, especially later in the season. There were few grass weeds in this location, though there was a trend for more grassy weeds in the untreated plots.

No herbicide treatment was found to cause phytotoxicity problems with any of the varieties used in this test. Furthermore, there was no impact on yield or fruit maturity.

Early season weed growth at the processing tomato trial was dominated by nutsedge. Prior to transplanting at the Firebaugh location, all pre-plant herbicides significantly reduced nutsedge growth as compared to the untreated control treatment, though Dual Magnum did better than Matrix. As a post emergence herbicide, Matrix is mainly effective on nightshades, but as a pre-emergent offers some suppression of nutsedge as well. At the July 19 rating, all herbicide treatments significantly reduced nutsedge compared to the untreated control, though there was no significant difference between pre-plant or post-emergence (Figure 2). There was a trend for reduced broadleaf weeds (mainly nightshade and purslane) as compared to the check plots, but this was not significant. Overall best weed control was observed with V-10142 at 0.5 lbs ai (unregistered herbicide from Valent), Dual Magnum, and the Sandea + Matrix (post) tank mix.

Like the fresh market trial, no crop phytotoxicity was observed (field variety was H9665). Yield was not measured at this location.

Summary

In the trials conducted in 2005 in commercial tomato fields, yellow nutsedge was a greater problem than nightshade. At both locations, Dual Magnum pre-plant incorporated significantly reduced nutsedge as compared to not applying any herbicide. In plots without pre-plant herbicides, best weed control was seen with the Sandea + Matrix tank mix. In three years of trials in various tomato production fields, a tank-mix of Sandea + Matrix has consistently provided excellent weed control as a post-emergent herbicide treatment. A few processing

varieties have been found to be sensitive to this mix, but in general most tomato varieties tolerate this tank-mix well and yield nor fruit development are significantly impacted.

**Weed Ratings, July 18, 2005
Fresh Market Tomato Weed Trial, Gustine CA**

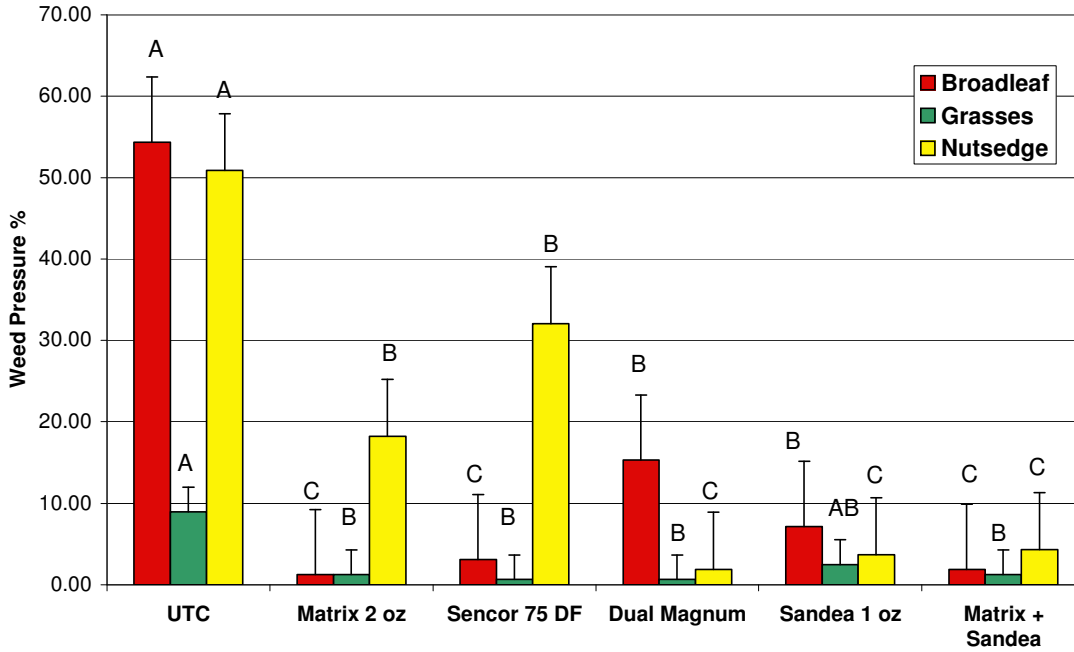


Figure 1. Weed pressure in fresh market tomatoes as affected by herbicide treatment. All herbicides except for Dual Magnum were applied post emergent to the weeds when the crop was near first bloom. UTC = untreated control. Weed categories (broadleaf, grass, and nutsedge) with the same letter are not significantly different at the 95% confidence level. Main broadleaf weed was purslane.

**Valent Nutsedge Trial on Processing Tomatoes 2005
Yellow Nutsedge Control**

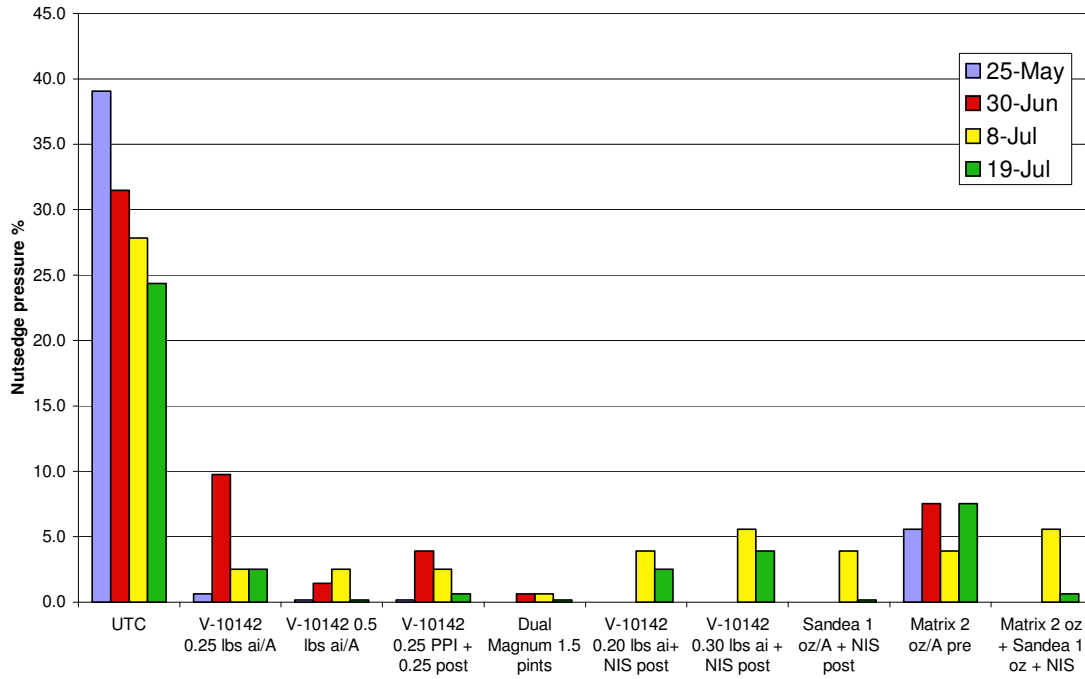


Figure 2. Yellow nutsedge control on various dates as affected by herbicide treatment in processing tomatoes. All herbicide treatments significantly reduced nutsedge growth as compared to the untreated control (UTC). V-10142 is an unregistered herbicide from Valent Corp. Post-emergent treatments were evaluated only after June 30.