

Application Temperature Impacts on Herbicide Effectiveness

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Winter annual broadleaf weeds are common problems in turfgrass. Application of herbicides in cool weather is generally thought to be less effective than treatments applied during warmer conditions. It has been suggested that products containing carfentrazone may be effective for broadleaf weed control in winter or early spring. Carfentrazone is a contact broadleaf herbicide sold by itself as QuickSilver. It can be added to systemic herbicides and is also available in the prepackaged mixes Powerzone and Speedzone.

The objective of this research was to compare the effectiveness of carfentrazone applied alone or in combination with systemic broadleaf herbicides for turf weed control. A combination product containing sulfentrazone was also included in the research conducted.

Two identical trials were conducted in order to determine the efficacy of carfentrazone applied alone (0.016 lb ai/A), Speedzone (carfentrazone plus 2,4-D plus MCPP plus dicamba at 0.020, 0.67, 0.2 and 0.06 lb ai/A, respectively), Speedzone Southern (carfentrazone plus 2,4-D plus MCPP plus dicamba at 0.020, 0.26, 0.10, and 0.025 lb ai/a, respectively), Powerzone (carfentrazone plus MCPA plus MCPP plus dicamba at 0.018, 0.97, 0.19, and 0.10 lb ai/A respectively), Surge (sulfentrazone plus 2,4-D plus MCPP plus dicamba at 0.024, 0.57, 0.20, and 0.09 lb ai/A, respectively) compared to Trimec Classic (2,4-D plus MCPP plus dicamba at 0.80, 0.22, 0.22, and 0.09 lb ai/A, respectively) on winter broadleaf weeds.

The first trial was conducted in well-maintained tall fescue (*Festuca arundinacea* Schreb.). The cool weather treatment was applied at 46 F and the warm weather application was made at 67 F. Control of ivyleaf speedwell [*Veronica hederifolia* L.], common chickweed [*Stellaria media* L. Vill.], and henbit [*Lamium amplexicaule* L.] was determined. The second trial was conducted in a stand of dormant common bermudagrass. The cool temperature treatment was applied at 44 F while the warm temperature application was made at 64 F. Along with ivyleaf speedwell and common chickweed, control of purple deadnettle [*Lamium purpureum* L.] and wild garlic [*Allium vineale* L.] was determined.

In trial one, warm weather applications resulted in greater initial control at 5 days after treatment (DAT) than cold weather application. However, by approximately 17 DAT, similar results were seen between cool and warm temperature applications of each herbicide. At this time, all herbicides applied in both weather conditions with the exception of Trimec Classic provided 92% or greater control of ivyleaf speedwell and 82% or greater control of henbit. Trimec Classic provided less than 50% control of both ivyleaf speedwell and henbit. At both temperature regimes, Trimec Classic and carfentrazone controlled common chickweed about 55% at this time. Common chickweed control with Surge, Speedzone, Speedzone Southern, and Powerzone at both application timings was similar, ranging from 68% to 78%.

At 34 DAT in both temperature regimes, all herbicides provided 96% or greater control of ivyleaf speedwell and 84% or greater control of henbit, with the exception of Trimec Classic

(approximately 58% control of ivyleaf speedwell at both temperatures and 34 and 68% henbit control for warm and cold temperature applications, respectively). Common chickweed control with a given herbicide was similar at both temperature regimes. All treatments except carfentrazone provided good to excellent control of common chickweed.

At approximately 2 months after treatment, all treatments at both temperatures gave 97% or greater control of ivyleaf speedwell and henbit, except for Trimec Classic, which gave about 85% control of ivyleaf speedwell and about 60% henbit control. All treatments except carfentrazone gave excellent common chickweed control.

In trial two, similar control trends were observed, although overall weed control was lower than in the first trial. At 7 DAT, warm weather treatments resulted in generally greater weed control. At 14 DAT, control of ivyleaf speedwell was similar between warm and cold temperature applications for a given herbicide. Control of common chickweed and purple deadnettle tended to higher with warm applications compared to cold applications for all treatments except Surge. By approximately 37 DAT, generally similar control was seen when comparing the effectiveness of a given herbicide applied at cold versus warm temperature application. Powerzone and Speedzone were the overall most effective treatments in the second study.

Application of these herbicides under warm conditions resulted in faster symptom development in broadleaf weeds, but long term control was generally similar between warm and cold temperature applications for a given herbicide. Better weed control in the first trial may be the result of younger plants (treated in mid-December) and competition from tall fescue. Trial two was in an area not regularly mowed and weeds were older and more mature (trial treated in early March). In general, Speedzone and Powerzone were more effective than Trimec Classic, which could be due to the presence of carfentrazone and/or due to the use of an ester form of 2,4-D and MCPA in Speedzone and Powerzone, respectively, compared to an amine form of 2,4-D in Trimec Classic. The addition of carfentrazone may provide an additive or synergistic effect. Using ester forms of 2,4-D (Speedzone) and MCPA (Powerzone) should improve effectiveness over an amine form of 2,4-D (Trimec Classic). Carfentrazone combinations with systemic broadleaf herbicides are effective for winter broadleaf weed control under cold weather conditions.