

Tank-Mixes for Non-Selective Vegetation Control

Susan Redwine, Jim Baird, Ron Calhoun, Mark Collins
Department of Crop and Soil Sciences

Looking for total postemergence vegetation control from a herbicide without soil activity Basically, there are two types of non-selective herbicides, contact and systemic. The contact herbicides provide quick burn and kill of foliage. Initial symptoms appear within a few days and sometimes hours of application. In general, contact herbicides work best on annual plants and are least effective on perennials since very little if any of the herbicide is translocated to reproductive tissues underground. Examples of commonly used non-selective contact herbicides include glufosinate (Finale), diquat (Reward), and pelargonic acid (Scythe). Each of these herbicides has a different mode of action, but they all provide quick burn and kill of tissue. The other type of non-selective herbicide is systemic in nature. In other words, it is absorbed through the foliage and translocated throughout the plant. The primary non-selective systemic herbicide is glyphosate (Roundup Pro). Systemic herbicides like Roundup Pro typically provide better control of perennial plants because more of the herbicide is translocated to reproductive structures located away from the site of herbicide contact (e.g., rhizomes, adventitious buds on roots, etc.). On the other hand, systemic herbicides are typically slow to act (depending upon environmental conditions) with initial symptoms appearing in days to sometimes weeks following application. Furthermore, compared to contact herbicides, systemic herbicides provide a poor edging effect because of their ability to translocate in the plant, and in turf, into adjacent plants.

There are both advantages and disadvantages to using contact and systemic non-selective herbicides. As such, would there be any advantage in tank-mixing both types of herbicides? Or how about tank-mixing two different types of contact herbicides for increased efficacy? Questions like these led us to conduct an experiment to test the efficacy of the aforementioned contact and systemic herbicides alone and in combination. The treatments shown below were applied on July 13, 1998 onto two areas, one a Kentucky bluegrass turf and the other area containing numerous grass and broadleaf weeds. The herbicides were applied using a CO₂-powered backpack sprayer calibrated to provide an output of 33 gallons per acre. In order to show initial treatment effects for Field Day, the same treatments were applied again 2 and 7 days ago.

Our hypothesis was that tank-mixing contact and systemic herbicides would decrease control of perennial species compared to a systemic applied alone. We reasoned that the contact herbicide, through its rapid contact action, would prevent or disrupt uptake and translocation of the systemic herbicide. Based upon your observations, what do you think?

Treatments evaluated in the non-selective herbicide experiment.

Product	Rate (fl. oz./gal)
Finale	2.0
Finale	3.0
Finale + Reward	2.0 + 0.5
Finale + Reward	2.0 + 1.0
Finale + Reward	3.0 + 0.5
Finale + Reward	3.0 + 1.0
Finale + Scythe	2.0 + 3.5
Finale + Scythe	3.0 + 3.5
Finale + Roundup Pro	1.5 + 1.5
Finale + Roundup Pro	2.0 + 2.0
Roundup + Scythe	2.0 + 3.5
Roundup Pro	2.0
Untreated Control	