

COTTON WEED MANAGEMENT SYSTEMS WITH IGNITE. P. A. Dotray, T. A. Baughman, K.M McCormick, and J. W. Keeling. Texas Tech University, Lubbock; Texas Agricultural Experiment Station, Lubbock; and Texas Cooperative Extension, Vernon.

ABSTRACT

The use of Ignite (glufosinate ammonium) herbicide in LibertyLink cotton will be an option for growers in 2004. Ignite is a postemergence herbicide that has broad-spectrum activity on a variety of annual and perennial grass and broadleaf weeds. Ignite is a fast-acting herbicide that has limited systemic movement in plants. Previous studies have shown that cotton tolerance to Ignite is excellent. Research in LibertyLink cotton is underway to examine weed management systems and economic returns using Ignite in LibertyLink cotton compared to other transgenic and non-transgenic cotton systems. Research was conducted in the Texas High Plains in 2003 to investigate the residual benefits of Staple (pyrithiobac) or Caparol (prometryn) in LibertyLink cotton. Additional studies in the High and Rolling Plains examined Ignite efficacy at different rates (0.42 and 0.52 lb ai/A or 32 and 40 ounces) applied to weeds at 2-, 4-, 6-, 8-, 10-, and 12-inches and examined Ignite efficacy using the following adjuvants: non-ionic surfactant, crop oil concentrate, methylated seed oil, organosilicone surfactant, ammonium sulfate, water conditioning agent, and a drift control agent. Traditional small plot techniques were used at all locations.

Near Lamesa, ivyleaf morningglory (*Ipomoea hederaceae*) was controlled 92% by Staple PRE at 0.0312 lb ai/A (0.6 oz) followed by (fb) Staple (0.6 oz) + Ignite at 0.42 lb ai/A (32 oz) applied postemergence (POST) at 4-leaf cotton. Similar control was observed following Staple (0.4 oz) + Ignite (32 oz) applied POST at cotyledon cotton fb Staple + Ignite POST to 4-leaf cotton. Lint yield from FiberMax 958 LibertyLink ranged from 1348 to 1463 pounds per acre in plots that received these PRE fb POST or POST fb POST combinations. Plots that received one Staple + Ignite POST application (0.6 + 32 oz or 0.9 + 40 oz) or the weedy check produced 1059 to 1250 or 354 pounds of lint per acre, respectively. Near New Deal, common cocklebur (*Xanthium strumarium*) was controlled at least 88% following the PRE fb POST or POST fb POST Staple/Ignite combinations in the LibertyLink cotton system. At several other locations, Caparol PRE at 1.2 lb ai/A (1.2 qt) fb Ignite (32 oz) or Ignite fb Ignite + Staple controlled lanceleaf sage (*Salvia reflexa*), ivyleaf morningglory, and Palmer amaranth (*Amaranthus palmeri*) at least 80% and devil's-claw (*Proboscidea louisianica*) nearly 70%.

Palmer amaranth was controlled at least 90% 1-week after treatment (WAT) when Ignite was applied to 2-inch weeds. Ignite applications to larger plants controlled Palmer amaranth less than 90%. Increasing the rate of Ignite from 32 to 40 ounces did not increase activity. At 1 WAT, devil's-claw was controlled at least 90% following Ignite at 32 ounces applied to 2- or 4-inch weeds and following Ignite at 40 ounces applied to 2- to 6-inch weeds. By 2 WAT, Ignite at either rate applied to 2-inch weeds and Ignite at 40 ounces applied to 4-inch weeds controlled devil's-claw at least 90%. Ivyleaf morningglory was controlled at least 90% regardless of Ignite rate or plant size at 1 WAT. By 2 WAT, ivyleaf morningglory was controlled at least 90% following Ignite at 40 ounces regardless of weed size and following Ignite at 32 ounces when applied to 2 to 8-inch weeds. Common cocklebur plants up to 6 inches in size were controlled at least 90% at both 1 and 2 WAT regardless if Ignite rate. Ignite at 40 ounces controlled 12-inch common cocklebur at least 90% 2 WAT. Initial burndown of lanceleaf sage was 90% when Ignite was applied at the 2-inch growth stage; however, control decreased to less than 70% following Ignite applications regardless of weed size 2 WAT.

Ignite efficacy was not affected by spray additives when applied to Palmer amaranth or carpetweed (*Mollugo verticillata*) 4-inches or less or to larger Palmer amaranth and stinkgrass (*Eragrostis cilianensis*). In another study in the Texas Rolling Plains, the addition of any additive except the drift control agent and ammonium sulfate increased Palmer amaranth control when compared to Ignite applied alone. In another study in the Texas High Plains, a sequential application of Ignite plus ammonium sulfate controlled Palmer amaranth more effectively than a sequential application of Ignite alone.

This research suggests that Ignite in LibertyLink cotton weed management systems that include Staple or Caparol can effectively control ivyleaf morningglory and other difficult to control annual broadleaf weeds. Ignite is most effective when applied to small weeds and coverage at the time of application appears to be very important. The addition of various spray additives had little or no effect on Ignite performance.