

RESPONSE OF SELECTED CROP AND WEED SPECIES TO PROPANE FLAMING AS INFLUENCED BY LEAF WATER CONTENT. Santiago M. Ulloa\*, Avishek Datta, Stevan Z. Knezevic, Chris Bruening, George Gogos, and Timothy J. Arkebauer. Graduate Student, Post Doctoral Research Associate, and Associate Professor, Haskell Agricultural Laboratory, University of Nebraska, Concord, NE 68728; Graduate Student, and Professor, Mechanical Engineering, University of Nebraska, Lincoln, NE 68588; Professor, Department of Agronomy and Horticulture, University of Nebraska, Lincoln, NE 68583.

The relative water content (RWC) is the ratio of the water volume in a leaf to the maximum water volume at full turgor. To determine the influence of RWC in plant response to propane flaming, greenhouse experiments were conducted during spring of 2009. Two weeds (velvetleaf and green foxtail) and two crops (corn and soybean) were treated with four propane rates (0, 30, 60, and 90 kg/ha) at four different times of a day (6 am, 10 am, 2 pm, and 6 pm). The RWC was measured before treatment application. Flaming treatment was conducted utilizing a hand flamer with one VT-2-23C vapor phase burner positioned 20 cm above soil surface and angled at 30°. The propane pressure was 18 PSI (100,000 BTU/hour) and the application speeds were 1, 2, and 3 mph. The plant responses evaluated were visual injury (1, 3, and 7 DAT) and fresh weight (7 DAT). All plant species had lower RWC during the afternoon, which made them more susceptible to flaming. For example, corn flamed with 90 kg/ha at 6 am had 48% injury 7 DAT compared to 70 % injury with the same propane rate at 6 pm. The same tendency was demonstrated by velvetleaf showing 71% injury when flamed with 90 kg/ha at 6 am and 98% injury 7 DAT when flamed at 6 pm. Similar trend occurred for green foxtail and soybean suggesting that RWC has an influence in plant response to flaming. Flaming could be more effective if done in the afternoon. [santiago@huskers.unl.edu](mailto:santiago@huskers.unl.edu)