WINTER WHEAT TOLERANCE TO BROADCAST FLAMING. Santiago M. Ulloa*, Avishek Datta, and Stevan Z. Knezevic. Graduate Student, Post Doctoral Fellow and Associate Professor. Haskell Agricultural Laboratory, University of Nebraska, Concord, NE, 68728-2828

Propane flaming could be included as an additional tool for weed control program in organic wheat productions. However, the crop tolerance to broadcast flaming must be determined first. Therefore, field experiment was conducted at the Haskell Agricultural Laboratory, Concord, NE in 2008 to determine winter wheat response to six propane rates applied at three growth stages of the crop, including: shoot elongation (SE), first node (FN), and boot stage (BS), which corresponded to the 4.0, 6.0, and 10.1 stages according to the *Feeks* scale of wheat growth and development. The propane rates included: 0, 12, 31, 49, 68, and 87 kg/ha (0, 2.5, 6.5, 10.5, 14.4, and 18.4 gal/acre). Flaming treatments were applied utilizing an ATV mounted flamer moving at a constant speed of 6.5 km/h (4 m/h). The response of wheat to propane flaming was evaluated in terms of visual injury at 7, 14, and 28 DAT, effects on yield components (spikes/m^2, seeds/spike, and 100-seed weight) and grain yield. Crop responses were described by log-logistic model. Overall response of wheat to propane flaming varied among growth stages and propane rates. In general, all three growth stages were sensitive to flaming and presented similar visual damage at 28 DAT. In particular, SE had the least yield loss and the least affected yield components compared to BS, which was the most susceptible stage to flaming resulting in highest yield loss, and largest loss of all yield components. Yield reduction is main concern with broadcasts flaming. Preliminary curve analysis suggested that arbitrarily acceptable yield reduction of about 5% (eg. threshold level) was achieved with the propane rate of about 5 kg/ha, regardless of the flaming stage. Based on our previous studies, propane rate of 60 kg/ha was needed for control most weed species, however such propane rate caused unacceptable yield losses of 25%, 32%, and 43% in this study for SE, FN, and BS, respectively. Therefore, due to unacceptable yield losses, we do not recommend the use of broadcast flaming in wheat at the above tested growth stages.

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