PHYTOTOXICITY AND YIELD OF FIVE POPCORN VARIETIES IN RESPONSE TO POST HERBICIDES. Damian D. Franzenburg, James F. Lux, and Micheal D.K. Owen, Agricultural Specialists and Professor, Department of Agronomy, Iowa State University, Ames, IA 50011.

Experiments were conducted near Ames, IA in 2003 to determine the effect of three POST applied herbicides on crop injury and yield for five popcorn varieties. The experimental design was a split plot with three replications. Popcorn variety was the whole plot and herbicide was the split plot. Popcorn varieties included Crookham R-98114W, Iowa Acres A-3035, Zangger N-11649, Ag-Alumni, and Schlessman SH4862. Herbicides included mesotrione, dicamba plus diflufenzopyr, and foramsulfuron. Untreated controls were included and maintained weed free. Split plots were 3 by 7.6 m and experiments were planted with 76 cm row spacing on soybean ground prepared by spring field cultivation. All herbicides were applied at labeled rates appropriate for V2 to V4 dent corn. Percent visual crop injury was evaluated at 1, 2, 3 and 5 weeks after application (WAA). Percent stalk lodging was recorded two weeks prior to harvest. Plots were machine harvested and yield was corrected to 15.5% moisture.

Crop injury observed 1 and 2 WAA revealed significant variety by herbicide interactions. Injury resulting from mesotrione and dicamba plus diflufenzopyr varied significantly for different popcorn varieties at both observation dates. Foramsulfuron, conversely, demonstrated injury that was consistently near 20% at 1 WAA and between 15 and 20% at 2 WAA. Mesotrione and foramsulfuron demonstrated the highest injury across varieties at 1 WAA. Mesotrione injury at 1 WAA ranged from 17 to 28% and was characterized by chlorotic upper leaves. Foramsulfuron and dicamba plus diflufenzopyr injury ranged from 18 to 22% and 8 to 18%, respectively, at 1 WAA. Injury from both herbicides appeared as shortening of upper internodes and chlorosis. Mesotrione injury was greatly reduced from one to two WAA, while foramsulfuron and dicamba plus diflufenzopyr injury was more persistent. Injury across varieties was highest with foramsulfuron at 2 WAA, followed by dicamba plus diflufenzopyr and mesotrione.

There was no significant variety by herbicide interaction for injury observations 3 and 5 WAA. At 3 WAA, foramsulfuron again demonstrated the highest injury across varieties. Dicamba plus diflufenzopyr and mesotrione were similar for injury severity. There were no differences in injury between herbicide treatments at five WAA.

No variety and herbicide interaction was detected for stalk lodging. There were significant variety and herbicide differences. Dicamba plus diflufenzopyr, caused more lodging than foramsulfuron when averaged across varieties. However, no herbicide treatment had significantly more lodging than the untreated control. Lodging differences between treatments were more often a variety effect. Crookham R-98114W lodging was higher than Iowa Acres popcorn variety. However, there were no other significant differences in lodging between varieties.

Zangger N-11649 was the highest yielding variety. However, there were no other significant differences or variety and herbicide interactions. Herbicide injury did not affect popcorn yield.

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