WEED DENSITY AND PERCENT COVER IN PUMPKIN FIELDS AND THEIR RELATIONSHIP TO CROP YIELD. Elizabeth T. Maynard, Regional Specialist, Department of Horticulture and Landscape Architecture, Purdue University, Westville, IN 46391.

Weedy and weed-free plots were established in nine commercial pumpkin (*Cucurbita pepo*) fields and one acorn squash field to evaluate broadleaf weed pressure and its relationship to crop yield during two growing seasons. One field from each of five farms was used in each season. Each producer applied his standard preemergent herbicide (clomazone and/or ethalfluralin) to all plots but subsequent cultivation and hand weeding were performed in the weed-free plots only. Grass weeds were removed from weedy plots by hand. Five to seven weeks after planting percent cover of broadleaf weeds in weedy plots averaged 12% (range 2% to 26%). Differences between farms were marginally significant at P<.10. Relative cover of broadleaf weeds, defined as (percent broadleaf cover)/(percent broadleaf cover+percent crop cover), averaged 0.22 in weedy plots (range 0.02 to 0.54). Relative cover differed among fields. The same two farms had the highest or next to highest percent cover and relative cover in both years; a third farm had the lowest or next to lowest percent and relative cover in both years. Percent cover estimates included pigweeds (*Amaranthus* spp.) on three farms in 1999 and two farms in 2000. Other weeds comprising more than 1/3 of the percent cover in at least one field included common ragweed, velvetleaf, horsenettle, carpetweed and ivyleaf morningglory. At harvest, densities of non-grass weeds averaged 10.5/m2 in weed-free plots and 17.0/m2 in weedy plots; total weed densities were 13.8/m2 and 19.5/m2, respectively. There was no difference in weed densities between weedy and weed-free plots averaged across all fields, but in some individual fields weed densities were higher in weedy plots. The most commonly recorded broadleaf weeds included common lambsquarters, pigweeds and velvetleaf. Weeds important in particular fields included horsenettle, eastern black nightshade, common ragweed, and yellow nutsedge. Aboveground weed dry weight at the end of the season was 15 g/m2 in weed-free plots and 151 g/m2 in weedy plots (p< .001). The weed treatment effect differed among farms: only three of the five farms had greater weed dry weight in weedy plots. Yields from pumpkin fields only were analyzed. Marketable yield averaged 31,800 kg/ha (range 11,400 to 54,200) with no difference between weedy and weed-free plots and significant differences between fields. Plants averaged 1 marketable fruit each (range 0.25 to 2.7), with an average weight of 5.2 kg (range 1.7 to 12.7), with no difference between weedy and weed-free plots but significant differences between fields. Relative yield, relative number of fruit per plant, and relative weight per fruit were defined as the value for a weedy plot expressed as a fraction of the value for the neighboring weed-free plot. Field means ranged from 0.69 to 1.56 for relative yield, 0.62 to 1.3 for relative number per plant, and 0.78 to 1.76 for relative weight per fruit. Linear relationships between field means for relative cover and relative yield or relative fruit number per plant explained 59% of the variation in relative yield (P<.05) and 66% of the variation in relative fruit number per plant (P<.05) when data from one field with carpetweed cover averaging 25% was excluded from analysis. Variation in relative fruit weight was not explained by relative cover. Linear relationships between non-grass weed densities at harvest and relative yield or relative number of fruit per plant explained 45% (P<.05) and 71% (P<.01) of the observed variation, respectively. Total weed densities explained similar amounts of variation. A linear relationship between the natural log of weed dry weight at harvest and natural log of relative yield explained 47% of the variation in relative yield (P<.05). Weed dry weight did not explain a significant amount of variation in relative fruit number per plant or relative fruit weight. The results suggest that in some fields weed control

measures in addition to preemergence herbicides are not necessary to prevent yield loss of pumpkins. With additional work, relative cover of broadleaf weeds might help to predict which fields are likely to benefit from postemergence broadleaf weed control measures.

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