

GROWTH AND DEVELOPMENT OF WILD OAT. Krishona B. Martinson, Beverly R. Durgan, and George O. Kegode, Graduate Research Assistant, Professor, Assistant Professor, Department of Agronomy and Plant Genetics, University of Minnesota, St. Paul, MN. 55108 and Department of Plant Sciences, North Dakota State University, Fargo, ND. 58105

Wild Oat has become an invasive and economically important weedy species in most cereal growing areas of the world, including the Red River Valley of Minnesota and North Dakota. It is well documented that wild oats can be controlled with herbicides. However, with increasing herbicide resistant populations, and environmental concerns, the understanding of wild oat growth and development and environmental effects is needed for optimum and consistent control. The objectives of this experiment are to evaluate the growth and development of wild oats, determine if later emerging wild oat plants have an accelerated rate of growth compared to early emerging wild oat plants, and evaluate environmental effects on wild oat growth and development. Research plots were established at two locations in 2002 and 2003; Fargo, North Dakota and Crookston, Minnesota to evaluate the growth and development of wild oat. Four emergence cohorts were selected; cohort 1 emerged in the initial week (one) of the experiment, cohort 2 in week two, cohort 3 in week three and cohort 4 in week four of the experiment. Plot size was 0.61 M x 0.61 M and the experimental design was a randomized complete block with six replications. In each emergence cohort, ten individual wild oat plants were randomly selected and numbered. On a weekly basis, individual plants were evaluated for height, leaf number on main culm, number of tillers and total leaves. Flag leaf emerged and date of heading were also recorded. Two weeks after heading, individual plants were harvested and potential seed production was calculated. Soil temperature, air temperature (maximum and minimum) and rainfall were recorded on a daily basis. Data was analyzed and means were separated with a LSD of $P = 0.05$. All four cohorts appeared to have a similar trend in growth. Based on biomass, wild oats in cohort 1 were the largest and wild oats in cohort 4 were the smallest. Cohort 2 and 3 were similar to one another and were always larger than cohort 4. Cohort 1 had the greatest seed production than the other three cohorts. Cohort 2 and 3 had less seed production than cohort 1 but more than cohort 4, and cohort 4 had the lowest seed production. The latest emerging wild oat plants grew as fast or faster than earlier emerging wild oat plants, and cohorts 3 and 4 have a shortened growing season. This research indicates that growth and development of wild oat may be predicted based on growing degree days. These results indicate that farmers must manage for all wild oats that emerge. Early emerging wild oat plants are larger and will be more competitive and will produce the most seed. However, later emerging plants, still have the potential to produce seed and if left uncontrolled, these wild oat plants will continue to increase the seed bank.