

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

Wild Oat is 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. Numerous research papers have focused on economic importance, geographic distribution, seedling dormancy and germination, population dynamics and wild oat response to herbicides. However, little research has focused on the biological aspect of growth and development or the difference in growth and development of early and late emerging wild oat plants. Differences in growth and development characteristics and environmental affects on wild oat growth and development are key pieces of information needed for optimum and consistent control. The objectives of this experiment are to evaluate the growth and development of wild oats, and determine if later emerging wild oat plants have a similar rate of growth compared to early emerging wild oat plants. Research plots were established at two locations in 2002; Fargo, North Dakota and Crookston, Minnesota to evaluate the growth and development of wild oat. Four emergence cohorts were selected; cohort 1 germinated 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 from the natural population and numbered. On a weekly basis, individual plants were evaluated for height, leaf number on main culm, number of tillers and total leaves. Date flag leaf emerged and date of heading were 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 similar growth and development. 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 not different from one another and were always larger than cohort 4. Cohort 1 had more potential seed production than the other three cohorts. Cohort 2 and 3 had less potential seed production than cohort 1 but more than cohort 4 and cohort 4 had the least amount of potential seed production. It appears that later emerging wild oat plants grew as fast, or faster, than earlier emerging wild oat plants, and cohorts 3 and 4 appear to have a shortened growing season. Wild oat plants in later emerging cohorts (3 and 4) also developed as soon, or sooner, than earlier emerging cohorts based on heading date. 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.