

PROLONGED NITROGEN FIXATION DURING PERIODIC MOISTURE STRESS TO ENHANCE YIELD AND PROTEIN ACCUMULATION IN SOYBEAN

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Drought is a significant abiotic factor challenging soybean production in Manitoba. Regular precipitation during flowering to pod-fill is essential for high seed protein and yield, making drought tolerant cultivars a research priority. This project tests for the presence of prolonged nitrogen fixation (PNF) traits in backcrossed derived short season soybean lines selected and Manitoba growing conditions. Yield and protein accumulation of fourteen lines and two check lines (nodulating and non-nodulating) were grown and assessed under ambient and supplemented moisture growing conditions in an experiment near Carman, MB. A split plot design was used with sub-surface irrigation treatments as the main plot and soybean line as the sub plot. The difference between lines grown under irrigation and natural precipitation is called Delta Yield and was used as a PNF trait indicator. Delta Yield and Delta Protein Yield were used to identify lines that were more capable of fixing N under periodic moisture stress. Three of the lines tested had lower Delta Yield and six of the lines tested had lower Delta Protein Yield than the mean of two site years . These lines may have PNF traits and should continue to be tested to help Canadian soybeans remain profitable and adapted to climate change.