PROJECT TITLE: The effect of the interaction of rates of nitrogen fertilizer, and varying irrigation water applications on the productions of beta glucans, protein, oil, yield, and test weight of oats and barley. SARC, Huntley, 1990.

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OBJECTIVES: The primary objective of this study is to determine to what extent, fertility and moisture affect the production of beta glucans. A substantial amount of spin-off data with regard to yield and quality, oil, and protein levels will also be analyzed. It is not known at this time if we can also contract for the analysis of the levels of tocotrienols (vitamin E type chemicals) which like the beta glucans are considered to lower cholesterol levels in humans.

RESULTS: While a significant amount of data has been generated in 1990, we will not present data tables at this writing. We have completed the data on yield and test weight, however, we will not have any chemical data information until well into 1991.

Four varieties of oats, Dal, Monida, Ogle, Otana which were selected based on agronomic and beta glucan contents were grown under four nitrogen and moisture levels. The nitrogen levels were 0, 40, 80, and 120 lbs of N per acre. Yields ranged 13 bu/A on the low moisture levels to 127 bu/A on the highest moisture levels. Oat yields responded to increasing levels of N only at the two highest moisture levels applied to the study. Throughout the study, results indicated that a N level of 40 lbs/A was sufficient to produce highest yields regardless of the moisture level applied. Test weights increased significantly with increasing moisture levels, from 20-30 lbs/bu at the low level to 30-40 lbs/bu at the high levels. Increasing the nitrogen rate to 120 lb/A nitrogen reduced test weight at all moisture levels.

Four barley varieties, Bearpaw, Shonkin, Steptoe and Waxbar were grown under conditions identical to the oats. Yield and test weight responses were similar to the results observed on the

oat study. The one exception was that the barley yield did respond more to additional N as compared to the oat varieties. Barley yields ranged from 16 to 93 bu/A and test weight from 37 to 60 for the barley selections.

SUMMARY: Neither the oat or barley variety yields responded to nitrogen leels above 80 lb/A in the 1990 trial, which occurred in the higher moisture level treatments. Data on actual inches of moisture applied has been collected but has not been analyzed at this time. Test weights for both oats and barley increased with increasing moisture and decreased at th higher nitrogen levels. The chemical analysis data will be available for the 1992 report.

FUTURE PLANS: This study will be continued in 1991.