ABSTRACTS

Dickinson State University Undergraduate Student Research Projects
Department of Agriculture and Technical Studies

Bulk Density Comparison within a Crop Rotation in Western North Dakota

Lauren Pfenning and Doug Landblom

Bulk density (BD) is a soil factor that affects plants and limits root growth. BD is influenced by; organic matter content, porosity, and soil structure. This study was designed to determine how BD, within a no-till crop rotation (spring wheat, triticale/hairy vetch/cover crop, corn, pea-barley, sunflower) differed between a continuous spring wheat control and native range. The BD evaluation is part of a long-term integrated cropping and beef cattle research project supported by a USDA/Sustainable Agriculture Research and Education grant being conducted at the Dickinson Research Extension Center Ranch Headquarters located southwest of Manning, North Dakota. The BD study evaluated 3 continuous spring wheat control fields, 15 crop rotation fields, and 3 native range study sites. The results indicated that compared to the spring wheat control, there was no BD difference between spring wheat in rotation, pea-barley, sunflower, corn and winter triticale/hairy vetch-cover crop ($P>0.10$). However, when native range was compared to all of the crops, BD of native range was less ($P<0.001$) except for corn that was similar to the native range ($P = 0.178$). The study shows that BD change is slow, but that change is beginning, as evidenced by the comparison between corn and native range.

Economics and Carcass Traits of Corn verse Barley Fed Hogs

Stefanie Bohrer, Doug Landblom, and Toby Stroh

The objective of this 112 day study was to compare corn and barley diets supplemented with Grolean concentrate to determine pig performance, carcass measurements, taste panel evaluation, and economics. Six barrows (Spot x Hampshire x Yorkshire) were divided into two feeding groups and fed either a corn or barley-based diet. During the experimental feeding period, the pigs were fed, weighed periodically (approximately every 30 days), monitored for health and marketed at a local meat slaughter and processing facility. Data was analyzed using the MIXED procedure of SAS. In the study, starting weight ending weight, gain, average daily gain, hot carcass weight, and carcass length did not differ ($P > 0.10$). Loin muscle area (e.g. 8.31 vs. 6.73 sq. in.; $P <0.01$) was greater for corn. For back fat depth, 1^{st}, 10^{th}, and last rib fat depth did not differ ($P >0.10$). Loin muscle tissue color and flavor did not differ ($P >0.10$). Corn in the study cost $2.00 more/bushel than barley and, due to corn's lower protein content, the corn diet required more Grolean protein supplement. The net return for barley fed hogs was $18.37 higher. These data demonstrate that ingredient decisions need to be based on least-cost formulation.