AGR1603: Evaluation of Contrasting Forage Pea Cultivars in Mixtures with Cereals for Greenfeed Production in Saskatchewan

Minimal agronomic information is available on forage pea-cereal mixtures for greenfeed production in Saskatchewan. The project was designed to assess the forage yield, forage quality, lodging resistance, and drying rate of pea-cereal mixtures in comparison to monocultures of peas, oats, or barley in three soil zones in Saskatchewan. The project also tested nitrogen fixation rate of peas in the mixtures with or without any nitrogen fertilizer application. In May 2016 and 2017, field plots of 12 different mixtures were seeded at Swift Current, Saskatoon, and Melfort, Saskatchewan. The field experimental design at each site was a split-plot arrangement on Randomized Complete Block Design (RCBD), with four replications. For analysis, the nitrogen treatment was considered as the main plot factor (original level vs. 60kg ha⁻¹), and the crop mixture was treated as a sub-plot factor. Pea-cereal mixtures produced similar forage dry matter (DM) yield to monocultures of cereals, but they contained higher protein concentrations regardless of seeding ratio. Percent of forage pea in mixtures was affected by growing conditions and seeding ratio with less pea DM contribution in dry environmental conditions. Application of a small amount of nitrogen fertilizer (50 lb/ac), increased yield of pea-cereal mixtures at the Melfort site, but this response was not observed at either Saskatoon or Swift Current. In addition, nitrogen fertilizer application decreased nitrogen fixation only at the Melfort site. Forage type pea, cv. CDC Horizon showed high lodging resistance both in pure stands and in mixtures, and produced higher forage yield than cv. 40-10 in pure stand. Drying rate of pea-cereal mixtures is mainly affected by temperature and rainfall. Under constant temperature of 350⁰C, the mixtures required three to five days to reach 17% moisture content, under controlled conditions. In a field environment, drying time was the shortest (13 days) in the Brown soil zone, intermediate (16 days) in Dark Brown zone, and the longest (22 days) in Black soil zone in 2016, but drying time was less than 10 days for all the three sites in 2017.