

AGR1707: Developing Field Pea Varietal Blends for Higher Yields and Pest Suppression

The development of semi-leafless peas, which do not have leaves on the tendrils, allowed peas to have greater resistance to lodging, and consequently higher yield under normal cropping conditions, than traditional leafed peas. However previous research has shown that when lodging is prevented, leafed pea can out-yield semi-leafless pea (Schouls and Langelaan, 1994). Growing leafed peas in a blend with semi-leafless peas may increase the lodging resistance of leafed peas, allowing it to reach its higher yield potential. Recent work at the University of Saskatchewan has shown that blending leafed pea variety CDC Sonata with semi-leafless pea variety CDC Dakota in a 25:75% leafed to semi-leafless blend, lead to a 12% yield increase above CDC Dakota under organic cropping conditions (Syrový et al., 2014). The yield advantage of the mixture appeared to originate from the leafed pea variety, which yielded nearly 3x more in this mixture than in monoculture. The University of Saskatchewan study agrees with other reports of yield increases in the range of 5-11% with leafed and semi-leafless pea blends (Ćupina et al., 2010; Schouls and Langelaan, 1994).

Research was undertaken in 2017 to determine the optimum blending ratio of leafed to semi-leafless peas to maximize yield, across different genetic backgrounds, locations, and years. The end goal of this research is to develop varietal blends of leafed and semi-leafless field peas for release by the University of Saskatchewan Crop Development Centre. The study was conducted on University of Saskatchewan research land near Saskatoon in central Saskatchewan, and evaluated nine pairs of leafed and semi-leafless pea lines, grown together in three mixing ratios. The lines used were leafed and semi-leafless versions of the varieties CDC Dakota, CDC Amarillo, and CDC Striker that shared the same genetic background with the exception of leaf type. These lines were paired in all possible combinations, and grown in ratios of 50:50, 33:67, and 17:83% leafed to semi-leafless peas, as well as in monocultures of each line grown alone. On average blends of leafed and semi-leafless peas were 4% higher yielding than monocultures of either leaf type. However yield increases and optimum mixing ratios were not consistent across the different variety combinations. Furthermore, it was rare that actual yield of blends exceeded expected yield, based on the yields of each line in monoculture, indicating that productivity of leafed peas did not increase in blends in most cases. Lodging levels remained very low overall in the 2017 season. We anticipate that enhanced lodging resistance will play a strong role in the yield potential of blends, therefore we expect the greatest yield benefit of blends to occur when lodging levels are high. This study will be conducted over five additional site-years in 2018 and 2019, to determine how frequently over-yielding occurs in blends, and to develop recommended blending ratios of leafed to semi-leafless peas to maximize yield.