Farmer-directed on-farm experimentation examining the impact of companion planting barley and oats on timothy-lucerne forage establishment in central Newfoundland

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Introduction Growing barley or oats in the year of forage establishment is a common agronomic practice in marginal growing regions, but is often not recommended to growers in Newfoundland. Spaner & Todd (2003) reported that barley seeded at rates of 100-150 kg seed/ha and undersown with a timothy-clover mixture (harvested at mid-milk) resulted in the planting year in greater forage yield of poorer quality than pure-stand timothy-clover. A barley seeding rate of 100 kg seed/ha did not impede forage production in the subsequent year.

Materials and methods Three experimental trials were planted on a dairy farm in central Newfoundland in 1998, 1999 and 2000. Treatments consisted of 1) Chapais barley planted at each of three seeding rates (22.5, 45 and 67.5 kg seed/ha) together with a forage companion crop and 2) Nova oat planted at the same three seeding rates together with a forage companion crop. The forage companion crop consisted of Champ timothy planted at a rate of 5.4 kg certified seed/ha together with Caribou lucerne planted at a rate of 10 kg certified seed/ha. Planting-year harvests were between 26 July and 5 August in each year, when the cereals were in the soft dough stage. Harvests in the production year were conducted between 21 June and 7 July, when lucerne had reached the late-bud stage.

Results The lucerne-timothy mixture companion planted with Chapais barley yielded 11% more forage dry matter than with Nova oats in the year of planting, but the two species did not differ for any forage quality trait. Increasing companion cereal crop seeding rates resulted in more tillers, but the forage contained less lucerne and had lower protein and higher neutral detergent fibre contents. Forage establishment was not impeded when companion planted with barley or oat at any of the seeding rates studied. There were no differences between treatments for forage yield or quality in the production year.

Technical conclusions In the present study, barley companion planting resulted in higher planting-year yields than companion planted oats. Nevertheless, there was a greater percentage of lucerne in the lowest seeding rate of the barley companion crop than with oats. Percent timothy in the forage harvested in the planting year was not altered by any treatment. Similarly, forage establishment was not impeded when companion planted with barley or oat at any of the seeding rates studied. Indeed, increasing companion cereal planting from 22.5 to 67.5 kg/ha in the planting year resulted in a 9% increase in forage dry-weight yield in the year following planting, with no difference in quality at any treatment level. Results from the present experiment indicate that a seeding rate of 67.5 kg/ha may be employed in central Newfoundland when companion planting barley or oats with a forage mixture of timothy-lucerne.

Farmer-directed on-farm experimentation This experiment was undertaken as the result of three imperatives: to foster closer relationships with farmers, to demonstrate varieties and technologies directly to the farming community and to maintain research activity with shrinking research dollars. There are limitations to on-farm experimentation such as this: 1) Most management decisions were dictated by practical considerations of the farm; 2) Farmers use large machinery, plant large areas and can not easily alter seeding rates to conform to exact numbers of plants/ha; 3) This large scale of experimentation implies that there will be a great deal of within-plot variation; and 4) This experiment was conducted on one farm and therefore the statistical inference space for these data is, strictly speaking, this farm. Nevertheless, local farmers are presently using these results in their day-to-day farming operations.

Reference

Spaner, D. & A.G. Todd. (2003). *Journal of Agronomy and Crop Science*, 189, 273-279.