Competitive Contract Production of Forage Seed in Western Canada

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Introduction

The PRGST trials are conducted to evaluate the agronomic performance of proprietary species and varieties of U.S. and European companies with the primary objectives to evaluate the performance of forage grass varieties for their potential and adaptability for contract seed production in western Canada. These cultivars are mainly developed outside of Canada and must be tested under Canadian conditions for seed yield and adaptability. The seed yield result of the cultivars under the PRGST trials are used to establish contacts between seed companies and growers. Agronomy practices including stand establishment, integrated weed control, fertility and removal of stands with direct seeding must be developed to ensure consistent seed yield production at economical costs of production. The main objectives of forage grass seed varieties testing trail are to increase the consistency, quality and marketability of turf and forage grass seed in an internationally important growing region and to increase the opportunities for contract seed production of American and European turf and forage seed cultivars and to generate seed yield data for varieties grown at regional sites under local growing conditions. Ultimately, all included varieties that perform well are directed for domestic and international markets.

Materials and methods

The Peace Region Grass Seed Testing (PRGST) trials were conducted at Beaverlodge, AB (lat. 55°12'N) in 2011, 2012, 2013 and 2014. Timothy (Phleum pratense L.), creeping red fescue (Festuca rubra L. var. rubra), meadow fescue (Festuca pratensis Huds.), tall fescue (Festuca arundinacea), smooth bromegrass (Bromus inermis Leyss) and meadow bromegrass (Bromus biebersteinii) varieties were tested for their agronomic performance and seed production potential under the peace region soil and weather conditions. The varieties in the trials were evaluated according to their agronomic performance that required two harvested years of seed production for fine fescue and three harvested years of seed production of bromegrass, tall fescue, meadow fescue and timothy. The forage grass varieties and the checks (regionally adapted varieties) included in the trials were obtained from Canadian and international seed companies and their foreign associates. The site at Beaverlodge, AB had been under pea-barley-wheat-canola rotation before seeding. The trials are direct seeded and fertilizer is applied in the fall according to results from the soil testing laboratory. During the trials, weeds were controlled by a combination of trimming, inter-row cultivation, and recommended herbicides. Individual experimental plots were comprised of four rows, each 6 m long with row spacing of 30 cm apart. The yield was collected from the central two rows. The experimental design for each species was a randomized complete block with four replications.

Results and discussion

Several seed companies (Barenbrug USA, BrettYoung, Crop Production Services, Foster's Seed and Feed LTD, Imperial Seed, Moore Seed Processors, DLF Pickseed Canada, Secan and Snow Brand Seeds) participated in the Peace Region Grass Seed Testing Program (PRGST) and new crops (meadow fescue) were included in the grass seed trials. The seed yield of forage grass varieties trials that established in 2011, 2012 and 2013 have been influenced by drought throughout the growing season of 2014 and the wetter than normal weather condition during June, July and August in 2013 growing season. Rainfall during May, June and July 2014 was lower than the 30 year average. Dry weather conditions in May 2013 slowed crop establishment and early growth under all trials that established in 2013 and 2014. It also influenced the above dry matter and seed production for the trials that established in 2011 and 2012. The total monthly rainfall was lower by 57% in May, 15% in June, 27% in July and 90% in August, 2014 than the 30 year total rainfall average for the same months at Beaverlodge (Figure 1). All crops under all trials, experiencing either excess water stress in 2013 or drought stress in 2014, likely had a limited seed production response to the varieties potential for seed production and adaptability at Beaverlodge in both 2013 and 2014 growing season.. The seed yields of timothy, creeping red fescue, meadow fescue, tall fescue and bromegrass were below the average in 2014 as compared to previous years for most forage grass varieties.

Timothy trials

There were several timothy varieties showing some potential for Peace Region growers, in spite of the extremely wet (2013) and drier than usual (2014) conditions. In the trial that established in 2011, the average total seed yield values of the 2012, 2013 and 2014 for Alma, S9520, BRF LAL1, Horizon, APH001, S9537, SBT0314 and APH1002 varieties ranged from 1037 to 1410 lbs acre-1(Fig. 1). This is higher or similar than the seed yield values of Climax (894 lbs acre-1) as a check variety for timothy.

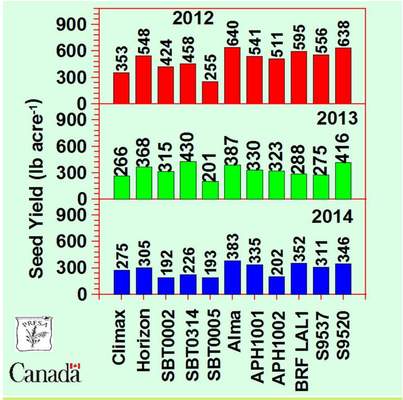

Figure 1. Seed Yield in 2012, 2013 and 2014 Timothy Trials Established in 2011 at Beaverlodge, Alberta.

Meadow and smooth bromegrass

The average total seed yield for the 2012, 2013 and 2014 for AC Admiral, AC Armada and BAR BcF1FRRL (meadow bromegrass) varieties ranged from 1445 to 1507 lbs acre^{-1}(Fig. 2). These seed yield were similar or higher than the seed yield of the check variety, Fleet, (14967 lbs acre^{-1}) for the meadow bromegrass. The total seed yield for S9478B, AC Knowles (hybrid bromegrass) and AC Rocket (smooth bromegrass) varieties ranged from 1315 to 1494 lbs acre^{-1} which were similar or higher than the average seed yield of Carlton (1294 lbs acre^{-1}) variety as a check for the smooth bromegrass. The average seed production of meadow and smooth bromegrass in the second and the third harvested years were below the average seed yield in 2013 and 2014 as compared to previous years.

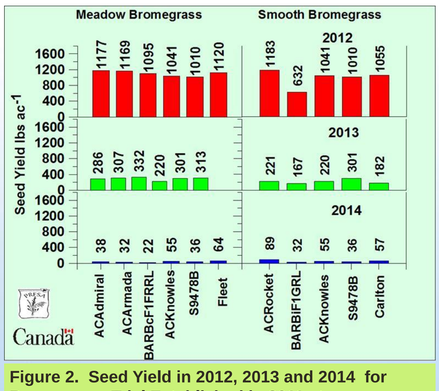

Figure 2. Seed Yield in 2012, 2013 and 2014 for Bromegrass Trial Established in 2011 at Beaverlodge, Alberta.

Creeping red fescue

The average seed yield of creeping red fescue ranged 30 to 875 lbs acre^{-1} in the first harvested year and ranged 124 to 497 lbs acre^{-1} (Fig. 3) in the second harvested year for CRF trial that established in 2012.

Meadow fescue

There were several meadow fescue varieties from Barenbrug USA (FP75RO, 11-09-FPF7, FP75RO1, COSMONAUT and BARCRYPTO) showing some potential for Peace Region growers, in spite of the drier than usual conditions. The average seed yield of the FP75RO (845 lbs acre-1) variety was higher than the seed yield of Preval (812lbs acre^{-1}) as a check variety for meadow fescue (Fig. 4). The daily rainfall distribution during the 2014 growing season at Beaverlodge, AB are presented in Figure 5.

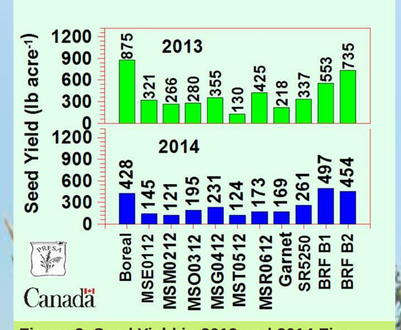

Figure 3. Seed Yield in 2013 and 2014 Fine Fescue Trials Established in 2012 at Beaverlodge, Alberta.

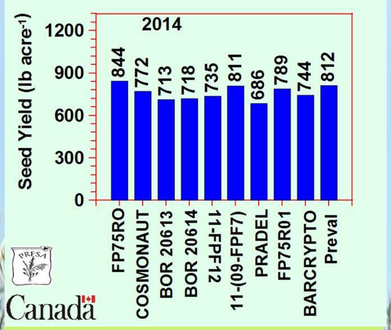

Figure 4. Seed Yield in 2014 for Meadow Fescue Trials Established in 2013 at Beaverlodge, Alberta.

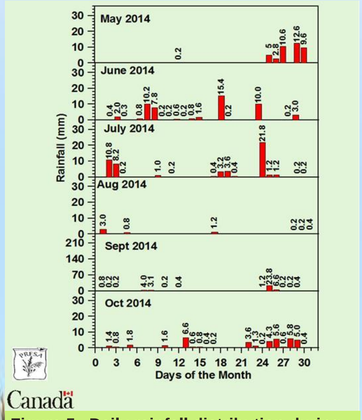

Figure 5. Daily rainfall distribution during the 2014 growing season at Beaverlodge, Alberta.

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