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CONTRASTING TALL FESCUE SEED PRODUCTION SYSTEMS: CASE STUDIES

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Abstract

Two tall fescue seed production fields (A and B) with some similarities but with important differences on the technology used were contrasted. Similarities: same cultivar (Rizar), an early, rhizomatous, with good seed potential production; new crops (two- and three-years old field areas); grazed from January to June; free of pests; 100 kg/ha of nitrogen in August/September and windrowed at the middle of November. Differences: 185 (A) vs 80 (B) kg/ha of nitrogen during fall and winter; rainfed (A) vs 165 mm of irrigation in 14 times from middle of August to windrowing (B), and harvest five days after windrowing with 15% seed humidity and artificial drying (A) vs harvest 14 days after windrowing with less than 9% seed humidity (B). Seed yield was evaluated in 12 main plots of 0.24 to 0.31 ha size in each field (field seed yield - FSY) using a commercial harvester, and in small plots (potential seed yield – PSY) taken before windrowing (three samples in each main plot), where seed yield components (seed weight - TSW and inflorescence/m² - infl/m²) were evaluated. Seed losses were registered in each main plot at different places and moments: among windrows before harvest (before and during windrowing seed losses), within windrows after harvest (windrow losses) and among windrows after harvest (harvester losses). Total forage dry matter (DM t/ha) before windrowing was assessed in each main plot. FSY was 759 kg/ha (A) and 896 kg/ha (B) and PSY was 751 kg/ha (A) and 1148 kg/ha (B). The main reason for this difference was seed losses, 73 kg/ha (A) and 332 kg/ha (B). Each field constructed the yield differently; the number of inflorescences were higher in A (723 inf/m²) than in B (436 inf/m²), but B had higher TSW (2.54 g) than A (2.16 g), and higher number of seeds/inflorescence, 104 in B and 48 in A. Total forage at harvest was high, 10.8 DM t/ha in A and 18.8 DM t/ha in B, with a harvest index respect to PSY of 0.070 (A) and 0.061 (B). With these results we hypothesize that the route for 1.0 t/ha seed production in Uruguay (0.33 t/ha national yield average) could be an adequate nitrogen rate in fall/winter to ensure enough new tillers, irrigation to obtain better seed set and seed weight, and seed drying to be able to harvest earlier with high seed humidity and thus reduce seed losses. However, the low number of inflorescences in the irrigated field was caused only by applying less nitrogen during fall/winter? Or we must improve management of irrigated crops, closing the grazing later? Or irrigate in a way that promotes tillers differentiation instead of new tillers, generating at the end of the process a crop with less total forage dry matter and higher harvest index? Could it be possible to combine the better yield components of these two fields (723 infl/m², 2.54 g TSW, 104 seeds/infl) to reach a 1.910 kg/ha seed tall fescue yield?

Keywords: tall fescue, seed production, irrigation, seed losses