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Dual purpose , small grain species for southern Brazil

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Key words : BRS Figueira ,BRS Umbu ,rye ,triticale ,wheat

Introduction Many small grain species , such as wheat , oats , barley , rye , and triticale , may be grown during the winter season in southern Brazil . Farmers use them as singular pasture , dual purpose (pasture and grain) , or just for grain . Wheat has the largest market , even though Brazil still is a traditional importer . When wheat is used as pasture , it may be grazed during vegetative stage ending at the early-joint stage , grazed throughout the season , or harvested for hay or silage . A research program was led by the National Wheat Research Center of Embrapa aiming to diversify sowing date and maturing dates , minimize erosion risks , and promote green cover under a no-till system . The objective was to compare small grain genotypes as dual purpose crops when harvested for forage once or twice during the vegetative stage .

Material and methods The trial was conducted at Embrapa Wheat research station in Passo Fundo , Rio Grande do Sul state from April 2003 to November 2005 . Fourteen genotypes of wheat , barley , rye , and oat combined with two harvest systems (one and two cuts) were replicated three times in a randomized complete block design . The plots were composed by seven rows 0.2 m apart and 5.0 m long , seeded in April (two-cuts system) and in May (one cut) at 350 seeds/m² . The fertilizer was applied to all plots at a rate of 300 kg/ha of 5-25-25 (N-P205-K20) plus 30 kg N/ha (urea) at tillering (May or June) and after each forage harvest . The plants with 30-cm height average were clipped to a 7.0-cm stubble height . Samples were dried out at 65°C and ground to pass a 1-mm screen using a Wiley mill and nutritive value analyzed using near-infrared spectroscopy (NIRS) .

Results There were genotype differences in each harvest system . In the 1st cut of the April seeding date , DM production levels by rye BRS Serrano (1.2 t DM/ha) , wheat BRS Figueira and barley BRS 195 were similar and highest of the genotypes . In the 2nd cut , again rye BRS Serrano (1.2 t DM/ha) was superior , but wheat BRS Umbu (1.1 t DM/ha) . For Total forage yield of the April seeding date , rye BRS Serrano (2.4 t DM/ha) was highest , barley BRS 224 (1.1 t DM/ha) was superior but rye BR 1 and triticale BRS 148 (1.0 t DM/ha) . The average forage nutritive value among seeding date and genotype was about 25% of CP (crude protein) , 51% of NDF (neutral detergent fiber) , 27% of ADF (acid detergent fiber) , and 68% of DMD (dry matter digestibility) . Grain yield from harvested of regrowth the highest of the April seeding date was highest for rye BRS Serrano (3.1 t/ha) and wheat PF 990423 (2.7 t/ha) . Triticale BRS 148 (4.1 t/ha) was superior in grain yield for the May seeding date .

Conclusions Two wheat cultivars , BRS Figueira and BRS Umbu , developed by the National Wheat Research Center of Embrapa , may yield as much as early forage as common oat , with additional average grain yield of 2.7 t/ha . Early seeding (April) may allow two grazing cycle with more than 2.0 t DM and about 3.0 t/ha of grain of small grain species . The new wheat cultivars are alternatives that allow more flexibility for improving mixed systems (dairy or beef cattle) in Rio Grande do Sul and Santa Catarina states , and the Southern-Center region of Paraná state .