The Production and Nutritional Composition of Annual Winter Growing Grass and Legume Species as Winter Pasture

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Introduction Perennial ryegrass , kikuyu and lucerne are the pasture base for milk production in the Southern Cape of South Africa . The dry matter production rate of these pastures differs during spring , summer and autumn but reach a mutual low during winter resulting in feed shortage during winter . The aim of this study was to plant different annual winter growing grass and legume species in pure stands and mixtures at different planting dates in an attempt to increase the dry matter production and quality of fodder produced during winter .

Materials and methods The trial was carried out during the winters of 2005 and 2006 under irrigation on an Estcourt soil type . Fertilizer was applied to raise the phosphorus level to 35 mg kg^{-1} , potash level to 80 mg kg^{-1} and pH (KCL) to 5 .5 . Nitrogen was applied at 55 kg N ha^{-1} $month^{-1}$. The following winter crops and cultivars were evaluated : annual ryegrass (*L . multiflorum* cv . Energa) , oats (*A . sativa* cv . SSH421) , triticale (*Triticosecale* cv . Bacchus) , serradella (*O . Sativus* cv . Emena) and vetch (*V . dasycarpa* cv . Max) . The planting dates were February , March , April and May . No seedbed was prepared . Eragrostis teff was planted during November of the previous year and throughout the summer grazed with Jersey cows . Four weeks before the planting of the winter crops , the teff was grazed down to 30 mm and sprayed with an herbicide (glufosate) at 3 liter ha^{-1} . The different crops were then planted , without the prior working of the soil , direct into the dead plant material with an Aitchison planter . The crops were grazed every 30 days to a height of 50 mm with Jersey cows . Dry matter (DM) production , crude protein (CP) content (%) , metabolisable energy ME (MJ/kg DM) and ME (MJ ME ha^{-1}) were determined .

Results The earliest first grazing was on the 31st of March obtained with the February planting date . The crops with the highest DM production rate (kg DM ha^{-1} day^{-1}) during March were oats (57 .7 kg DMha^{-1} day^{-1}) , triticale (40 .3 kg DMha^{-1} day^{-1}) , oats-triticale (57 .8 kg DMa^{-1} day^{-1}) , oats-serradella (50 .7 kg DMa^{-1} day^{-1}) and oats-vetch (44 .1 kg DM$^{h}a^{-1}$ day^{-1}) planted during February . Oats was the superior crop in the mixtures . The highest DM production rates during the winter (June/July/August) were obtained with the February planting date from ryegrass and ryegrass based pastures (ryegrass : 45 , 56 and 73 kg DM ha^{-1} day^{-1} for June , July and August respectively) , ryegrass-oats : 49 , 51 and 71 kg DM ha^{-1} day^{-1} for June , July and August respectively) and ryegrass-triticale (38 , 52 and 74 kg DM ha^{-1} day^{-1} for June , July and August respectively) . The March planting date resulted in a lower May DM production rate of ryegrass (15 .6 kg DM ha^{-1} day^{-1}) in comparison to oats (49 .1 kg DM ha^{-1} day^{-1}) and triticale (46 .3 kg DM ha^{-1} day^{-1}) or oats-triticale (52 .3 kg DM ha^{-1} day^{-1}) . The mean CP content (%) of the different crops was high (>23%) . The mean IVOMD of the different crops was high (>75%) . The IVOMD decreased (<75%) at the end of the season (October November) . Planting date influenced the winter DM production of the different crops . February and March are the best planting dates to plant annual crops for production during June , July and August .