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The seasonal and total dry matter production of annual legume cultivars in the southern Cape

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Background

- Annual temperate legumes provide high quality fodder for dairy cattle during winter and spring if established during autumn.
- Large variety of temperate annual legume species and cultivars are available
- Production potential of cultivars assist producers to make informed decisions best suited for their fodder flow requirements.



The aim of this study was to evaluate the seasonal and total dry matter production of temperate annual legumes in the southern Cape.

Materials and methods

- Outeniqua Research Farm, George, South Africa
- 22 Annual temperate legume cultivars evaluated
- Irrigated small plot cutting trial
- Randomised block design with three replicates
- Established April into cultivated soil
- Inoculated with species specific inoculant prior to establishment
- Dry matter production determined every 28 days



Table 1. The scientific name, common name, cultivar and seeding rate for forage legumes evaluated.

Scientific name	Common name	Cultivar name	Seeding rate (kg ha ⁻¹)
<i>Trifolium alexandrinum</i>	Berseem clover	Calipso	10
		Elite II	10
<i>Trifolium Vesiculosum</i>	Arrowleaf clover	Zulu	15
		Cefalo	15
<i>Trifolium michelianum</i>	Balansa clover	Viper	4
		Taipan	4
<i>Trifolium subterranean</i>	Subterranean clover	Losa	15
		Dalkeith	15
		Woogenellup	15
		Campeda	15
<i>Trifolium resipunatum</i>	Persian clover	Morbulk	10
		Laser	10
		Maral	10
<i>Vicia dasycarpa</i>	Vetch	Max	35
		Capello	35
<i>Medicago truncatula</i>	Barrel medic	Paraggio	15
		Parabinga	15
<i>Medicago Polymorpha</i>	Burr Medic	Jaguar	15
		Santiago	15
		Scimitar	15
<i>Ornithopus sativus</i>	Pink serradella	Emena	25
		Margurita	25

Results and discussion

Table 3. Monthly growth rate (kg DM ha⁻¹ day⁻¹) of annual legume cultivars

Species	Cultivar	Monthly growth rate (kg DM ha ⁻¹ day ⁻¹)				
		Winter		Spring		
		July	Aug	Sept	Oct	Nov
Berseem	Calipso	6.51 ^e	48.9 ^{abc}	36.2 ^{bcde}	37.3 ^{bcd}	18.1 ^{ab}
	Elite II	2.75 ^{gh}	38.6 ^{cde}	37.8 ^{bcde}	65.0 ^a	32.8 ^a
Arrowleaf	Zulu	0.77 ^h	13.8 ^{ghi}	27.3 ^{efgh}	37.9 ^{bcd}	29.1 ^a
	Cefalo	2.83 ^{gh}	5.30 ⁱ	9.58 ^{hi}	47.9 ^{abc}	-
Balansa	Viper	0.69 ^h	20.1 ^{fgh}	28.0 ^{efgh}	37.4 ^{bcd}	10.6 ^{ab}
	Taipan	0.29 ^h	17.4 ^{fgh}	24.2 ^{efgh}	39.5 ^{bcd}	3.53 ^b
Subterranean	Losa	3.77 ^{fg}	40.0 ^{cd}	40.3 ^{bcde}	29.4 ^{def}	-
	Dalkeith	1.36 ^{gh}	30.0 ^{def}	11.8 ^{ghi}	1.07 ^g	-
	Woogenellup	2.28 ^{gh}	43.6 ^{bcd}	55.6 ^b	35.7 ^{cd}	3.70 ^b
	Campeda	0.98 ^h	25.9 ^{efg}	42.3 ^{bcde}	33.0 ^{cde}	2.58 ^b
Persian	Morbulk	2.08 ^{gh}	13.5 ^{ghi}	31.2 ^{defgh}	36.4 ^{bcd}	19.0 ^{ab}
	Laser	1.17 ^h	13.3 ^{ghi}	24.0 ^{efgh}	35.6 ^d	13.1 ^{ab}
	Maral	1.31 ^{gh}	14.9 ^{ghi}	34.7 ^{bcdef}	35.3 ^{cd}	12.0 ^{ab}
Vetch	Max	9.92 ^{bc}	20.9 ^{fgh}	45.1 ^{bcde}	12.1 ^{fg}	-
	Capello	9.74 ^{bcd}	21.9 ^{fgh}	26.1 ^{efgh}	7.55 ^g	-
Barrel medic	Paraggio	7.20 ^{de}	59.2 ^a	52.9 ^{bcd}	16.8 ^{efg}	-
	Parabinga	5.79 ^{ef}	56.9 ^{ab}	39.0 ^{bcde}	9.42 ^g	-
Burr Medic	Jaguar	12.0 ^{ab}	22.7 ^{fgh}	33.2 ^{cdefg}	6.08 ^g	-
	Santiago	1.72 ^{gh}	9.32 ^{hi}	1.32 ⁱ	3.52 ^g	-
	Scimitar	1.06 ^h	11.8 ^{hi}	13.6 ^{fghi}	1.69 ^g	-
Serradella	Emena	13.0 ^a	36.6 ^{cde}	90.5 ^a	43.0 ^{bcd}	20.1 ^{ab}
	Margurita	1.36 ^{gh}	49.0 ^{abc}	54.9 ^{bc}	53.5 ^{ab}	25.3 ^{ab}

Table 3. Seasonal and total dry matter production (t DM ha⁻¹) of annual legume cultivars

Species	Cultivar	Winter	Spring	Total
Berseem	Calipso	2.07 ^{abc}	2.39 ^{cde}	4.45 ^{bcd}
	Elite II	1.38 ^{ef}	3.47 ^{ab}	4.84 ^{bc}
Arrowleaf	Zulu	0.47 ^{hi}	1.96 ^{defgh}	2.43 ^{ghi}
	Cefalo	0.25 ⁱ	1.19 ^{ghijk}	1.44 ^{ijk}
Balansa	Viper	0.61 ^{ghi}	1.68 ^{defghi}	2.29 ^{hij}
	Taipan	0.50 ^{hi}	1.85 ^{defghi}	2.35 ^{hij}
Subterranean	Losa	1.52 ^{de}	1.98 ^{defgh}	3.50 ^{defg}
	Dalkeith	0.98 ^{fg}	0.35 ^{kl}	1.34 ^{jk}
	Woogenellup	1.47 ^{de}	2.65 ^{bcd}	4.12 ^{cde}
	Campeda	0.83 ^{gh}	1.85 ^{defghi}	2.67 ^{fgh}
Persian	Morbulk	0.60 ^{ghi}	2.23 ^{def}	2.83 ^{fgh}
	Laser	0.50 ^{hi}	1.91 ^{defghi}	2.41 ^{ghij}
	Maral	0.56 ^{ghi}	2.19 ^{defg}	2.74 ^{fgh}
Vetch	Max	1.65 ^{cde}	1.61 ^{efghi}	3.26 ^{efgh}
	Capello	1.65 ^{cde}	0.95 ^{ijkl}	2.60 ^{fgh}
Barrel medic	Paraggio	2.43 ^a	1.97 ^{defgh}	4.40 ^{cd}
	Parabinga	2.21 ^{ab}	1.37 ^{fghij}	3.58 ^{def}
Burr Medic	Jaguar	1.92 ^{bcd}	1.11 ^{hijkl}	3.02 ^{fgh}
	Santiago	0.38 ^{hi}	0.14 ^l	0.48 ^k
	Scimitar	0.41 ^{hi}	0.41 ^{ijkl}	0.82 ^k
Serradella	Emena	2.42 ^a	3.94 ^a	6.36 ^a
	Margurita	2.23 ^{ab}	3.29 ^{abc}	5.52 ^{ab}
LSD (0.05)		0.458	0.998	1.093

Conclusions

- Growth rate varied over months and cultivars
- Serradella cultivars, **EMENA AND MARGURITA**:
 - high DM production during winter and spring
 - highest total DM production
- Annual legume cultivars can provide winter and spring fodder if planted in Autumn

Thank you

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