

PASTURES FROM SPACE®– HISTORICAL PASTURE GROWTH RATE CAN BE USED TO DETERMINE POTENTIAL STOCKING RATE ON FARMS

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Stocking rate is the primary driver of productivity and profitability on sheep farms. For livestock producers to adopt more flexible stocking rates they must have an estimate of the potential stocking rate for their property. This information also allows them to benchmark their current stocking rate against potential targets for carrying capacity. This paper compares potential on-farm stocking rates derived by three methods: 1. from data on historical pasture growth rates in the Pastures from Space® program predicted using a spatial model (Donald *et al.* 2004), 2. annual rainfall (French 1987), 3. length of growing season (Saul and Kearney 2002). Stocking rates were derived between 1994 and 2004 for a property at Kojonup in Western Australia.

Weekly pasture growth rates in the Pastures from Space® program were used to derive the total pasture grown on the property for each of the 11 years. The potential stocking rate (dse/ha) was then calculated by the formula [(pasture grown - 1500 kg DM/ha)/400 kg DM/ha], where 1500 kg DM/ha is an estimate of losses from trampling and residues left on the ground for soil stabilisation and 400 kg DM/ha is the annual pasture allowance for one dry stock equivalent (Grimm 1998). Stocking rate based on annual rainfall was calculated by the formula [(annual rainfall - 250 mm)/25x1.3] and those based on length of growing season by the formula [-11.05 + 3.41 (growing season months) + (0.178 x 20 mg/kg Olsen P)].

Table 1. Potential stocking rates (dse/ha) derived using three methods; 1.Pastures from Space growth rates, 2. annual rainfall, and 3. length of growing season, between 1994 and 2004 at Kojonup, W.A.

Year	Pastures from Space	Annual rainfall	Length of growing season
1994	11	6	10
1995	14	12	14
1996	14	15	12
1997	12	18	11
1998	15	15	22
1999	17	16	14
2000	10	9	11
2001	14	7	15
2002	16	9	17
2003	17	13	19
2004	12	7	13
Mean	14	12	14
SD	2	4	4

The average potential stocking rates were similar for the 3 methods but the methods varied wildly in some years. This variation can be attributed to the fact that both the annual rainfall and length of growing season calculate stocking rate indirectly, whereas the weekly pasture growth rate estimated by the Pastures from Space® program is a direct assessment of the annual pasture production from which it is possible to calculate potential stocking rate.

Livestock producers now have a way of directly measuring the carrying capacity of their property which is a tool that can be used to adopt more flexible stocking rates on farms.

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