

Role of soil seed bank on persistency of pastures in tropical grasslands of Kangayam

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Key words : soil seed bank , persistency , Kangayam grasslands

Introduction The semiarid grasslands spread over a wider area in the rain shadow region covering four districts viz ., Erode , Karur , Coimbatore and Nammakkal of Tamil Nadu in India is unique whose continuous existence were traced up to 18th March 1865 , the inception of formal land record . The spread of grassland is about 140 km in east west direction and 95 km in the north south direction with a perimeter of approximately about 480 km . The pattern of land use system with *Cenchrus* as dominating spp is being maintained over centuries on sustainable manner with minimum interference and cultivation of land . The grass spp *Cenchrus* , live fence *Balsamodendron berryi* supporting the system of pasture paddock maintained by private ownership had contributed to development of famous cattle breed Kangayam better known for its draught power . The present experiment conducted to elucidate the role of soil seed bank contributing to the persistency of this unique grassland system .

Materials and methods The survey and sampling of paddocks were done in alternate years during December 2003 and during December 2005 since most proportion of seeds of perennial grasses are viable upto two years . The sampling was done with soil sampler 10 cm diameter core to a depth of 5 cm with the soil samples weighing an average of 350 g . The number of sample depends on the size of the paddock . Soil samples were sieved using fine sieves and then the seeds of the grasses and forbs were separated manually under magnification and counted .

Results and discussion The seed bank estimation of initial survey had shown that *Cenchrus spp* is dominating the seed bank composition with 72.7 per cent followed by *Chrysopogon fulvus* (4.23%) and leguminous seeds was only 0.78 per cent while rest 21.9 per cent are seeds of forbs and weeds . The total number of seeds in each sample ranged from 9 to 434 depending on the density and diversity of the above ground extant species . Density of the seeds of *Cenchrus spp* is more in the surface and decreases with increasing depths . Most of the paddocks are being maintained with self-sown seeds of *Cenchrus spp* , which is evident with the diameter of the tussock recruited seedlings ranging from 1.9 to 6.3 cm with an average of 3.6 cm . The average number of tussock / m² of *Cenchrus spp* is 19.4 , besides the presence of other spp like *Zornia* , *Boerhavia* and *Indigo fera* spp . Survey results reflected that the farmers' practice reseeded of their pastures with seeds of *Cenchrus spp* once in 2-3 years depending on reduction in tussock density due to poor regeneration or uprooted while ploughing with tractor followed by failure of expected rainfall .

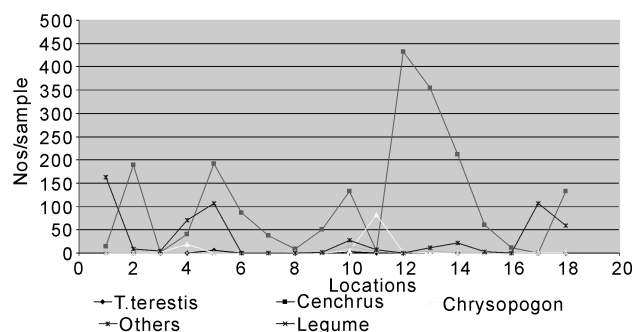


Figure 1 Composition of soil seed bank from the grassland of Kangayam .

Balsamodendron berryi , a time tested proven species used for live fencing the paddocks with fodder value also regenerates from the soil seed bank under natural conditions . Seeds of *Acacia leucophloa* added to soil bank after ingestion by sheep as pods comprise an important component of seed bank dynamics thereby helps to sustain the pasture paddocks .

Conclusion Soil seed bank and regrowth from vegetative propagules majority of which are grasses had contributed to the persistency of the paddock and the research outcome helps in understanding the biological reasons which sustained this tropical grassland ecosystem since centuries and can help in strengthening and replicating the successful model under similar situation of applicability .