

## Forage resources of arid region of Rajasthan

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### Introduction

Arid region of Rajasthan state covers the area of the state towards western side of Aravali range of hills, which divides the state almost in two parts viz., eastern and western. The arid region of the state is important for animal husbandry and forage management. The reason is that at many places in this region, annual rainfall is below 250 mm. Farmers can take only one crop in rainy season because irrigation water is not available in most of the area for the remaining part of the area. Due to importance of animal husbandry, importance of forage resources is important in the region. In this paper, information of forage plant resources of arid region has been given, which include field crops, perennial range grasses and legumes, fodder trees and shrubs, some other annual plants etc.

#### PRIORITY CROPS OF THE REGION

Region	Priority I	Priority II	Priority III
Arid*	<i>Lasiurus indicus</i> , moth, pearl millet	Guar	Other range grasses and legumes
Semi-arid**	<i>Cenchrus ciliaris</i> , <i>Cenchrus setigerus</i> , <i>Panicum antidotale</i> , pearl millet, sorghum, guar, lucerne	<i>Dicanthium annulatum</i> , maize, NB hybrid, oat, cowpea	Other forage crops like barley, etc.
Canal irrigated areas in arid and semi arid areas	Lucerne, maize	Berseem, guinea grass, NB hybrid	

\* In arid areas, *Prosopis cineraria* and *Z. nummularia* to be incorporated in the system.

\*\* *Ailanthus excelsa* to be integrated as tree component.

## Field crops

Important *kharif* crops for green fodder are pearl millet (*Pennisetum glaucum*), sorghum (*Sorghum bicolor*), maize (*Zea mays*), cowpea (*Vigna unguiculata*), cluster bean (*Cyamopsis tetragonoloba*). Important *rabi* crops for green fodder are oats (*Avena sativa*), barley (*Hordeum vulgare*), lucerne (*Medicago sativa*) and berseem (*Trifolium alexandrinum*).



Pearl millet



Cluster bean



Cowpea



Guinea grass



Oat



Lucerne



Barley (Dual purpose crop)



Bajra x Napier hybrid

### Perennial range grasses and legumes

Pasture development is important on a land area, where crops cannot be taken. Pasture can be developed by growing perennial grasses. Silviculture and horti-pastoral systems are also important in which these grasses are also used. Perennial range grasses are important in western part of the state. They supply fodder at cheap cost and help in soil conservation. Perennial grass species like *Cenchrus ciliaris*, *Cenchrus setigerus*, *Lasiurus indicus*, *Dichanthium annulatum*, *Panicum antidotale* and *Setaria nervosum* are grouped as 'High Perennial' species as they give high forage yield under natural rainfed conditions. *D. annulatum* is adapted to heavy soils with annual rainfall above 380 mm. *P. antidotale* is suited to well-textured soils with annual rainfall of 250 mm and above. *S. nervosum* grows well on hilly terrain.

*Sewan* (*Lasiurus indicus*) grass is important in Bikaner and Jaisalmer districts of Rajasthan. *Dhaman* (*Cenchrus ciliaris*) and *Moda Dhaman* (*Cenchrus setigerus*) are important in other arid districts of the state. These two grasses require comparatively more fertile soil in comparison to *sewan* grass. Soil fertility of pastures can be improved by cultivation of legumes. Legume crops also improve nutritive value of the fodder. *Clitoria ternatea* is one such perennial range legume for the western Rajasthan. Other important

legumes for pasture development are *Dolichos lablab*, *Stylosanthes hamata*, *Stylosanthes hamilis*, *Stylosanthes guyanensis* etc.



Sewan grass with fodder shrub mopane



Sewan grass pasture



*Cenchrus ciliaris*



*Cenchrus seigerus*

### **Fodder trees and shrubs**

Fodder trees can be grown in agroforestry system with livestock. It is always useful to have some fodder trees in pasture without affecting fodder yield of the grasses. Silvopastoral system is a good way for fodder supply in which grasses, legumes and trees are grown together. Fodder tree and shrub species provide fodder during scarcity period. *Khejri* (*Prosopis cineraria*), *zhadberi* (*Ziziphus nummularia*), *Acacia nilotica* etc. are important fodder trees in the western Rajasthan. Leaves of many tree species are used as fodder for livestock. Goats, sheep and camels mostly eat these tree leaves. Fodder trees are important in

arid and semi arid areas because they can tolerate moisture stress condition. Some common fodder trees are : *Acacia arabica* (babul), *Acacia senegal* (kumat,), *Ailanthus excelsa* (ardu), *Albizia lebbek* (siras), *Azadirachta indica* (neem), *Dalbergia sissoo* (sissoo), *Hardwickia binata* (anjan), *Leucaena leucocephala* (subabul), *Prosopis cineraria* (khejri), *Prosopis juliflora* (pardeshi khejri) or vilayati babul. Some fruit trees also provide fodder. Some examples of such fruit trees are ber (*Ziziphus mauritiana*), pilu (*Salvadora oleoides*), goonda (*Cordia myxa*), goondi (*Cordia gharaf*), kumat (*Acacia senegal*), khejri (*Prosopis cineraria*), tamarind (*Tamarindus indica*), bael (*Aegle marmelos*), drumstic (*Moringa olerifera*), ker (*Capparis decidua*) etc.



Khejari



Nutan



Mopane



Hedge lucerne



Jhadberi

## **Conclusion**

Forage resources of arid region of Rajasthan require due attention for their efficient management to feed the large animal population of the region with balanced nutrition. Health of animals, associated for human diet, indirectly also affects human health. According to an estimate by Department of Animal Husbandry, Government of Rajasthan, deficit situation has been predicted in the future by 2020 in the state for green fodder availability according to the requirement. So, to remove the deficit, green fodder production is to be increased. Proper crop strategy is required for increasing green fodder production. Selection of crops and their varieties is as important for increasing fodder production as it is for increasing grain production for crops. Green fodder demand can be fulfilled by supply from cultivation of green fodder crops on rainfed and irrigated lands, production from pastures, wastelands, forests etc. The western part of the state is having large area under permanent pastures and grazing lands. Barren and uncultivable land is also available in this part to a sizeable magnitude, where possibilities of growing some forage plants can be explored. Thus, fodder production, especially in arid region of the state requires proper strategy and implementation of that for the better socio-economic scenario and for that purpose forage resources are important.

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