

CAZRI Anjan 2178:

A high fodder yielding Anjan grass variety for Rajasthan

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*Semi-starvation of livestock is a rule in the drier parts of Rajasthan due to arid ecosystem. In fodder scarcity years, this problem worsens. However, perennial Anjan grass (*Cenchrus ciliaris* L.) can provide drought proofing through fodder availability, as the established pastures of this species provide nutritive fodder within two to three weeks of effective rainfall (25-30 mm). To address the issue of low animal productivity and to meet the future fodder requirement, variety CAZRI Anjan 2178 was released in 2018 from ICAR-Central Arid Zone Research Institute, Jodhpur, Rajasthan. CAZRI Anjan 2178 variety is a selection from western Rajasthan made during 1995. It is a thin stemmed variety which matures in 23-25 days (50% flowering). This variety has potential to produce 210 q per hectare green fodder and 67 q per hectare dry matter yield with an average productivity of 108 q green biomass and 38 q dry matter under rainfed conditions.*

Keywords: Anjan grass, Arid, Dry matter, Green fodder, Scarcity

ANJAN grass (*Cenchrus ciliaris* L.), a member of family Poaceae (Gramineae) Tribe Paniceae, is C₄ perennial tufted grass. It is a highly nutritive forage grass which has wider adaptability. The grass grows in drier parts to high rainfall areas and light to heavy soils of India. In western Rajasthan, droughts are common feature resulting in shortage of fodder for the livestock. Semi-starvation of livestock is a rule in this fragile ecosystem of the country. In fodder scarcity years, this grass can provide drought proofing as the established pastures of this species provide nutritive fodder within two to three weeks of effective rainfall (25-30 mm), whereas annual forage species are harvested at least six to seven weeks after sowing. The fodder is free from anti-nutritional factors even at this early stage. Besides the nutritive fodder, it prevents wind and water erosion, and enhances soil fertility. The soils of the arid zones are sandy and light, and significant soil losses occurs due to high wind velocity particularly

in summer season. Under such situation, this rhizomatous species provides protection to soils from wind erosion. Mostly, the varieties of this species have well developed root rhizomatous system. In view of increasing animal population and to fulfill the future fodder requirement, variety CAZRI Anjan 2178 with high green and dry matter yield was released in 2018 for Rajasthan vide notification no. S.O. 1379 (E), Ministry of Agriculture and Farmers' Welfare, dated 27-03-2018. It is suitable for cultivation in Rajasthan.

CAZRI Anjan 2178 variety is a selection from western Rajasthan made during 1995. Its plants are erect with profuse tiller production and branching, luxuriant growth and medium tall plants (82 cm). It has abundance of yellowish green foliage with medium long leaves and medium leaf: stem ratio (1.22). It is a thin stemmed variety. Its node pigmentation is purple, fresh stigma colour is pink and spike colour at maturity is purple. Days to

50% flowering ranges between 23-25 days and seeds mature between 35-45 days.

Target areas for cultivation

The variety is released for Rajasthan, however it can also be grown in low rainfall areas under rainfed conditions. Tested in North West Zone at Jodhpur, Bikaner, Avikanagar and Jalore under rainfed conditions, it is suitable for the state. Normally dry sowing is done in rows with 5 kg seeds per hectare at row spacing of 70 cm preferably prior to onset of monsoon. However, recent studies have shown that wider row spacing is more effective row spacing in arid areas which saves seeds, reduces cost of cultivation and increases the age of the sward.

Fodder yield: In varietal trials, on an average, its green fodder yield was 108.4 q/ha, 15-33% more than the yields of two checks CAZRI 75 (94.1 q/ha) and IGFRI 3108 (81.2 q/ha). It also yielded high dry matter (38.4 q/ha), 82% more than IGFRI 3108 (21.1 q/ha). Frequency in a group of top three varieties was higher (4/5; 80%)



Cenchrus ciliaris variety CAZRI Anjan 2178 at wider row (140 cm) spacing



Seeds of variety CAZRI Anjan 2178



Spikes of variety CAZRI Anjan 2178

Seed yield: Range grasses seeds are rare commodity and not easily available in open market. Poor physical quality (< 80%), low germination (<30%) and various adverse climatic conditions are the bottlenecks in the seed production of the grasses. From a well-managed seed plot, up to 80 kg seeds can be harvested from one hectare seed plot of the variety. At ICAR-CAZRI, Jodhpur, quality seed production of this variety is being undertaken in about 2.7 hectares.

Other desirable traits: Plant height is more than CAZRI 75 (NC) and slightly less than IGRI 3108 (NC). Due to thin stem, the variety is also suitable for small ruminants. In respect to fodder quality, variety CAZRI Anjan 2178 recorded 5.1% crude protein in varietal trials.

Reaction to major diseases and insect pests

The variety is free from major diseases and insect pests. Rarely, grass hopper may damage the crop. Need based use of insecticides is advised to manage these insects.

than CAZRI 75 (40%) and IGRI 3108 (0%) for dry matter yield. It also recorded 1.5 to 39% high per day green fodder production (2.03 q/ha/day) over checks CAZRI 75 (2.0 q/ha/day) and IGRI 3108 (1.46 q/ha/day). Maximum green fodder yield of the variety recorded was 210.8 q/ha, 14.8% more than the best check CAZRI 75 (183.7 q/h) in 2005. It consistently had more green forage production than both the checks. Percent increase was up to 51.2% high over the checks in different years of testing. Only in 2006, reduced green forage yield (-6.5%) was recorded than the best check IGRI 3108. Maximum mean dry matter production in the variety was 67.3 q/ha, 4.0% more than the best check CAZRI 75 (64.7 q/ha) recorded in 2005. Similar to green fodder, it consistently had more dry matter production than both the checks in all the years except CAZRI 75 in 2006. Percent increase in dry matter yield was up to 95.1% higher than IGRI 3108 in 2005.

Table 1. General botanical description of *Cenchrus ciliaris* variety CAZRI Anjan 2178

Name of the variety	CAZRI Anjan 2178
Common name of the species	Anjan grass
English name of the species	Buffel grass
Botanical name of the species	<i>Cenchrus ciliaris</i> Linn.
Family status	Belongs to family Poaceae (Gramineae) Tribe Paniceae
Growth habit	Erect with profuse tillering and branching, and luxuriant growth, medium tall (up to 82 cm)
Foliage	Abundance of yellowish green foliage with medium long leaves, leaf: stem ratio is 1.22 (medium)
Node colour	Purple (lower nodes)
Fresh stigma colour	Pink
Days to 50% flowering	23-25 days (harvesting stage)
Days to maturity	35-45 days (seed maturity stage)
Maturity group	Showed earliness for flowering in the trials conducted at Jodhpur
Spike colour at maturity	Purple
Spike length	Medium (12.3 cm)
No. of seeds/spike	Low (93)
Spike density	Semi-lax
Bristle length	Long
1000-seed weight	High (3.8 g)
Grain colour	Brown
Grain shape	Conical
Senescence	Actively growing
Adaptability	High in North West Zone (Rajasthan)



Seed plot of CAZRI Anjan 2178 at wider row spacing (140 cm)

Economic benefits

From one or more years old pastures, forage can be utilised in 2-3 weeks after the first effective showers during summer monsoon. In the normal rainfall, two to three cuts can be taken when harvested at right stage which is initiation of inflorescence to 50% flowering stage. From one hectare, around 40 quintals dry matter yield can be taken from these harvests. An amount of ₹24000 to 28000 can be realised from the

sale of fodder or can be grazed in the fields. In the drier areas, well managed pastures give economic yield up to five years and in semi-arid areas, the age of the pasture is more than five years. The fodder is free from anti-nutritional factors at every stage of the growth. Indirect benefits are more, viz. enrichment of soil fertility, energy saving, shelters many fauna, environmental friendly, employment to the rural youth etc. This variety is a native to

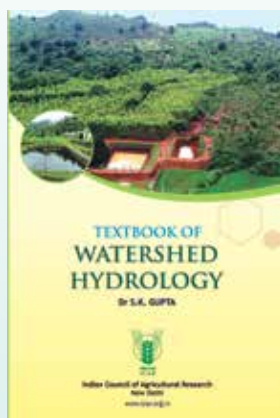
western Rajasthan, hence tolerates high temperatures. Under the changing climate scenario, it may prove as best genotype for the arid zone pastures.

SUMMARY

To meet the demand of milk and other animal products, strong dairy husbandry is the need of the hour. Healthy animal husbandry requires sufficient fodder of good quality. Western Rajasthan is shelter house of droughts and each year drought like situation prevails. The gap between demand and supply of fodder remained unbridged resulting in semi-starvation of the livestock of the region. High-yielding, drought and temperature resistant varieties may be some good alternatives in bridging this gap. Anjan grass variety CAZRI Anjan 2178, a new state released variety provides more than 100 quintals green fodder and 40 quintals dry matter from one hectare land ideally suitable for the conditions of Rajasthan, may be suitable proposition under the changing climate situation. This thin stemmed leafy variety is quite relished by small ruminants also.

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