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FACULTY OF AGRICULTURAL SCIENCES & ALLIED INDUSTRIES

CULTIVATION OF FINGER MILLET

BOTANICALNAME	*Eleusine coracana* Gaertn
FAMILY	Poaceace
CHROMOSOME NO.	2n=20
COMMON NAME	Ragi

INTRODUCTION:-

Finger millet is important small millet grown in India.

It is a staple food in many hilly regions of the country.

It is grown both are grain and forage.

Grains are rich in minerals and are the richest source of calcium used in many preparations like cakes, puddings, sweet etc.

The green straw is suitable for making silage. It is also good for persons suffering from diabetes.

IMPORTANCE:-

Finger millet is considered one of the most nutritious cereals.

Finger millet contains about 5–8% protein, 1–2% ether extractives, 65–75% carbohydrates, 15–20% dietary fiber and 2.5–3.5% minerals. Of all the cereals and millets, finger millet has the highest amount of calcium (344mg %) and potassium (408mg %).

The cereal has low fat content (1.3%) and contains mainly unsaturated fat. 100 grams of Finger millet has roughly on an average of 336 KCal of energy in them.

However, the millet also contains phytates (0.48%), polyphenols, tannins (0.61%), trypsin inhibitory factors, and dietary fiber, which were once considered as “anti nutrients” due to their metal chelating and enzyme inhibition activities.

Finger millet is an excellent source of natural calcium which helps in strengthening bones for growing children and aging people.

Regular consumption of finger millet is good for bone health and keeps diseases such as osteoporosis at bay and could reduce risk of fracture.

ORIGIN:-

According to DeCandolle (1886) finger millet (mandua) probably originated in India, as many of the forms exist in this country.

It might have originated from Elusine indica, a grass that occurs in many parts of northern India.

Vedic literature says - India

Vavilov suggested – Abyssinia

Plant type:-

Erect annual

Profusely tillering

Stem is compressed, elliptic

Leaves linear with distinct mid-rib

Leaf sheath completely envelops the stem

Leaves are arranged alternatively

Panicles of different shapes:-

Curved top.

Incurved.

Open.

Fisty shaped.

Average no. of spikelets per finger is 67-73.

Each spikelet contains 4-6 flowers.

Crop is self-pollinated.

Special features in India: -

Area remained almost constant.

Production & Productivity increased.

Due to better variety and management:-

It is major millet in Southern part of India .

It is cultivated for grain and forage.

Cultivated up to an altitude of 2100m.

Area in India:-

State	Million ha	Million t	T /ha
Karnataka	0.94	1.40	1.02
Maharastra	0.16	0.15	0.94
TN	0.14	0.30	2.11
UP	0.14	0.19	1.29
AP	0.10	0.10	1.04
India	1.71	2.31	1.35

Climate:-

It is grown in tropics and sub-tropics

Mean temp of 26-29°C is best proper growth

Crop yield reduces below 20°C

Crop has good drought recovery

Transpiration coefficient is small (½ to 1/3 of wheat)

High capacity for soil water uptake

Grown well in RF of 500-900mm

Soil:-

Wide adaptability to different soils

Very poor to fertile soils

Can tolerate salinity >pH 11.0

Best soils are alluvial, loamy and sandy with good drainage

Heavy clay soils with poor drainage less suitable

Field preparation:-

Deep ploughing cum shallow harrowing at last

Fine tilth is essential

Form beds & channels with 10 to 20m-2

Provide irrigation channels at proper interval for irrigated crop

Apply FYM / compost before forming bed

Varieties:-

Many cultivars are available

CO RA 14 – 105 -110 d

CO 13 – 95-100 d

CO 9 100 d

TRY 1 102 d

Paiyur 1 115-120 d

INDAF 5 105-110 d

GPU 28 110-115 d

Time of sowing:-

As rainfed crop in Jun-July

First fortnight of June is best for rainfed

As irrigated crop more than one season in Karnataka, AP & TN

Under rainfed yield is affected by early and late sowings

In hilly areas of UP & HP it is sown in Apr-May itself

Spacing & seed rate for rain fed:-

A spacing of 20-25cm row

22.5cm was seen better than 15cm

Seed rate of 6-8kg

For transplanting:-

5 kg for nursery (12.5 cents, 18-20 d old)

15 x 15 cm in TN o 30 x 7.5cm in some areas

Stand establishment:-

Seed treatment is must

Seedling roots may be dipped azospirillum

2 seedlings / hill o 3 cm depth

Thin the population in direct seeded crop to maintain optimum plant stand

Irrigation:-

For rain fed crop too irrigation at tillering flowering can increase the yield

Irrigation at 50% depletion is sufficient

It may be based on growth phases:-

Establishment 2 irrigations

Vegetative up to 25 days – 2 irrigations

Flowering – 25-55 d – 3 irrigations

Maturity – 56 – onwards – one or two

Stop irrigation after dough stage

Nutrient management:-

Responds well to fertilizer

General recommendation 60:30:30

But responds up to 160 kg N♣ 50 kg P2O5

Application of Mg @ 50 kg and Ca @ 20 kg is also favoring crop growth

Half N & full P & K basal

Balance N at 15 DAT / 25DAS

Seed inoculation with bio-fertilizers is advantageous

Weed management:-

Severe problem and controlling early (2-3 weeks) is very essential

Hand weeding gives satisfactory control of weeds

Herbicides like Butachlor 1.25 kg as pre-emergence for transplanted crop

For direct seeded crop post-emergence 2, 4 DEE or 2, 4 D Na salt @0.5 kg 10 days after crop germination

Cropping systems:-

Under rain fed conditions mixed with sorghum, pearl millet and variety of oilseeds & pulses

In hilly areas mixed with soybean

Under irrigation grown in rotation with Tobacco, vegetables, turmeric, gram, linseed, mustard

FM – sugarcane; FM – potato – maize; FM-rice etc

Major problems:-

Diseases:-

Blast:-

Control measures:-

Treat the seed with Thiram or Ceresan @ 2.5g/kg of seed.

Grow resistant variety like that Sharad, PES-8, PES-176, VL-146, VL-149, Gautami etc

Seedling blight:-

Control measures:-

Seed treatment with organo-mercurials likr Ceresan orThiram etc

Spray the crop with 0.2% Zineb.

Downey mildew:-

Control measures:-

Spray 0.2% Mancozeb 75WP.

Keep the field clean.

Insect pests:-

Stem borer

Grass hopper

Ear head eating cater pillar

Control measures:-

They may be controlled by using Diazinon 5% or Endosulphan 4% granules @ 20 kg/ha.

Dusting 2% Methyl parathion dust @ 25-30 kg/ha in early stages may control both the insects.

Aphids may be controlled by spraying the crop with Phosphamidon 85 SL @ 250 ml/ha in 1000 liters of water.

Harvest:-

Ear head alone

Staggered harvesting is also done to collect differentially maturing ear heads

Ear heads are dried and manual / machine threshed

Straw may be harvested and dried for animal.

YIELD:-

With the improved package and practices, it is possible to harvest 20-25 q/ha of grains and 60-80 q/ha of fodder/ha.

The straw of manduwa makes nutritious fodder.

It can be conserved by putting up in well build stakes.