

MILLETS - FOR LONG TERM FOOD, FEED AND NUTRITION SECURITY

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OVERVIEW

- **Millets, the food and feed crops**
- **Place of millet crops in Indian agriculture**
- **Millets, The nutritious grains**
- **Millets – Indispensable for long term food, feed and nutrition security**

Millets-the food and feed crops

- **Small seeded cereal grasses – coarse grains**
- **First crops to be domesticated**
- **Sorghum & pearl millet – major**
- **Finger millet, other small millets - minor**
- **Nutritious food grains**

Millets in Indian Agriculture

- Long cultivation history of > 3000 years
- Figure prominently as rain fed crops
- Rich millet crop diversity in India
- Hardy crops, Physiologically very efficient
- Wide adaptation – reliable harvest
- 20 -22 m ha area;20 m t production
- Gradual area depletion

Sorghum –Jowar

- **3rd most important food- feed crop**
- **9 million ha area-*kharif* and *rabi***
- **Karnataka, Maharashtra, A.P.,T.N., in Deccan plateau**
- **M.P., Gujarat, Rajasthan and U.P., in central India**

Sorghum-Drought hardy crop

- 400-800 mm rain fall
- Rabi crop dependent on stored moisture
Kharif productivity higher
- Many variety options
- Hybrids popular in *Kharif*
- Forage and sweet sorghum are important

Sorghum based cropping systems

- Hybrid sorghum + pigeon pea
- Sorghum + fodder cowpea
- Sorghum –Safflower/gram sequence cropping

Pearl millet -Bajra

- **4th in importance, only grain crop option for semi arid regions**
- **India major grower,10 m.ha**
- **Rajastsan,Maharashtra,Gujarat,U.P., Haryana, A.P., Karnataka & T.N.**

Pearl millet only crop option

- Crop of dual importance in semi arid regions
- Only option for water deficit areas
- Reasonable assured harvests
- Rajasthan major grower
- High genetic potential responds well to irrigation
- Wide variety options

Pearl millet based cropping systems

- **Several options for inter cropping with legumes**
- **Pearl millet +cluster bean/moth bean/cowpea/green gram/red gram (2:1)**

Finger millet-Ragi

- **Very wide distribution and adaptation**
- **Area around 1.7 m.ha**
- **Highest productivity among millets**
- **Grown in many states - very important in areas of production**

Finger millet – A wonder grain

- **Grown in all seasons**
- **Wide variety choice**
- **Tolerant to drought and salinity**
- **Grain long storage life, highly nutritious versatile grain**

Finger millet based cropping systems

- **Several traditional intercropping systems in vogue**
- **Mixed intercropping with 7-9 crops in Akkadi**
- **Finger millet + Pigeon pea (8:2) /soybean(4:1) / field bean(8:1)**

Other Small millets

- **As many as 5 millets grown**
- **Foxtail millet, little millet, kodo millet, barnyard millet and proso millet are the major ones**
- **Grown through out the country in all states**
- **Synonyms-Minor millet, U.U. crops, miscellaneous cereals**
- **Around one million ha area**

Small millets –heritage crops

- **3000-5000 years cultivation history**
- **Major food crops at one time**
- **Highly resilient crops, assured harvests**
- **Catch crops**
- **Suitable for less fertile native fertility /LEIA
/fewer pests/diseases**
- **Improved varieties available**
- **Highly nutritious grains**

Small millets based cropping systems

- **Several traditional intercropping systems in vogue especially with kodo, foxtail and little millet**
- **Inter cropping with grain legumes-pigeon pea/green gram/soybean/black gram**

Crop	Protein (g)	Carbohyd rates (g)	Fat (g)	Fibre (g)	Mineral s(g)	Calcium (mg)	Phospho rus(mg)
Wheat	11.8	71.2	1.5	12.9	1.5	41	306
Rice	6.8	78.2	0.5	5.2	0.6	10	160
Sorghum	10.4	72.2	1.9	12.0	1.6	25	222
Bajra	11.6	67.5	5.0	16.0	2.3	42	296
Finger millet	7.3	72.0	1.3	18.8	2.7	344	283
Proso millet	12.5	70.4	1.1	14.2	1.9	14	206
Foxtail millet	12.3	60.9	4.3	14.0	3.3	31	290
Kodo millet	8.3	65.9	1.4	15.0	2.6	27	188
Little millet	8.7	75.7	5.3	12.0	1.7	17	220
Barnyard millet	11.6	74.3	5.8	13.5	4.7	14	121

Nutritional composition of millet grains

Summing Up

- **Provide wide options for rain fed farming**
- **Millet not poor yielder. Genetic potential for high productivity is there. Management is the key**
- **Nutritionally far superior grains**
- **Need to change the mind set of people**
- **Nutraceutical properties to be encashed**

Summing Up ...

- **Production to consumption systems at farm level need better understanding**
- **Enhancing demand is the key**
- **All avenues to value addition to be explored**
- **Food security to be viewed from regional angle**
- **Regional crops to be promoted for achieving food - feed security**
- **Millets to be declared as heritage crops**



Thank You