

## Rice in Coorg

by

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Rice (*Oryza sativa*) is one of the earliest crops to come under cultivation in Coorg. The time-honoured religious festival *Huthri*, celebrating the harvest of paddy gives some indication as to the great antiquity of this cereal here. From olden times each family has been assigned a block of unalienable paddy land and the agricultural economy is closely linked with various aspects of paddy cultivation.

**Area:** Rice covers about fifty percent of the cultivated area today. There has been a small but steady increase in area, from 66, 896 acres in 1870 to 92, 778 acres in 1953.

**Climate:** Coorg is a hilly country perched on the Western Ghats between  $11^{\circ} 56'$  and  $12^{\circ} 50'$  North longitude and  $75^{\circ} 22'$  and  $76^{\circ} 12'$  East latitude receiving the benefit of the South-West monsoon and a fair quantity of the North-East monsoon. The annual rainfall varies from about 40 inches in the eastern border to nearly 200 inches on the western zone. The heaviest rainfall recorded is 386 inches in Bhagamandala in 1924 and the lowest in Fraserpet, 29 inches in 1918. Throughout the growing season the atmosphere is quite humid and the temperature ranges from  $40^{\circ}\text{F}$  to  $92^{\circ}\text{F}$ . Rice thrives well in all zones, but in the colder places the same variety takes a longer time to come to maturity. Drought conditions are sometimes experienced due to failure of rains. No frosts have been reported.

**Season:** Only one crop is raised in most places, from July to January and a second crop is grown between November and March wherever there is enough water supply, especially in Sampaje and a few valleys in North Coorg. Dry paddy or *Bithne* as it is called, is sown behind the plough in April and harvested in October in some parts in the north-eastern zone. Although a second crop of rice is a distinct possibility in many places, this has not come into vogue due to cattle trespass and the fear of thunderstorms in March-April, when the crop would be ready for harvest.

**Water:** Rice needs an abundant supply of water and it is the major factor in determining the variety and the season

for the crop. The water requirement of paddy is estimated at 23,000 gallons of water per acre and it needs a constantly changing supply of water throughout its growth. The major area of rice falls under purely rainfed conditions. About 2,500 acres are irrigable during the final stages, if the monsoon fails. While the uplands have to depend purely on rainfall the lowlands get the benefit of the seepage water and the innumerable springs. In spite of the high rainfall which sometimes cause damage to the crop as well as to the fields, there are instances where crops have failed for want of water during the maturing period. Although light, the North-East monsoon is decisive of yields. Coorg presents special problems in planning out irrigation schemes. Storing the rain and seepage water in small tanks and reservoirs adjoining the fields and pumping it out during the scarcity periods is feasible. An attempt at utilising the ground water in the valleys where the water table is high during the summer for raising a second crop needs further investigation.

**Drainage:** Drainage is as important as irrigation and there is evidence that improper drainage has led to reduced yields in some areas. Notably a vast fertile tract in Begur Collie gets submerged with water till October. Transplanting is considerably delayed and even then is quite hazardous. Providing efficient drainage may be very expensive but possibilities of introducing flood-tolerant varieties need consideration.

**Soil:** Rice is usually grown in the valleys which are of considerable breadth and some miles in length in South Coorg and rather small and narrow in North Coorg. The lower broader fields and called *bailu gadde*, while those terraced up along the slopes depending chiefly on the rainfall are called *mani gadde*. Rice is grown at altitudes from 1,000 to 4,900 feet above mean sea level.

The soil in Coorg has been formed by the weathering of the metamorphic rocks and in the valleys it is usually a lateritic debris very deep and easily drained. The top ploughed layer is usually sandy loam, greyish-white in colour. In the lower depths the profile is a heterogenous mixture of reddish and greyish sandy loam and clay with concretions of iron and manganese. Mica, felspar and quartz are found in varying proportions. An yield survey has indicated high fertility on the river banks. The remaining area is intrinsically poor. But during the monsoon the fields receive the decomposition products of the neighbouring forests and the leached

nutrients from the slopes, which probably account for the good yields.

The results of analysis of two typical samples of the plough layer from paddy fields are given below :

	<i>Gowdhalli</i>	<i>Kalkeri</i>
	%	%
Loss on irrigation	8.31	5.50
Insolubles	83.54	92.85
Iron and alumina	6.36	1.63
Lime	0.08	0.08
Potash	0.52	0.12
Phosphoric acid	0.20	0.16
Available phosphoric acid	0.07	0.009
Available potash	0.08	0.03
Nitrogen	0.12	0.20
pH	6.5	5.8

There would also appear to be some zonal differences, perhaps due to the climatic conditions and environments. The soils of Napoklu and Merkara nads in the heavy rainfall zone are highly leached and show remarkable absence of lime. Soils of Virajpet and Somwarpet are more fertile and have a comparatively better texture. Soil of Ponnampet are sandy with patches of waterlogged areas. In the Fraserpet zone receiving lower rainfall, there is a certain amount of calcium in the soils which are mostly clayey. Because of the constant leaching they are all deficient in exchangeable bases and available nutrients.

Varieties: There are said to be more than 50 varieties popular here. The important among them are listed below :

	<i>Estimated acreage</i>	<i>Duration in days</i>
Kirbiliya	30,500	165
Kiggatbiliya	18,000	165
Mambiliya	18,400	165
Doddabiliya	4,900	175
Doddi	4,800	145
Chendubiliya	3,700	175
Sannabatha	3,100	145
Kembatti	1,400	145
Kesakki	1,400	175
Kajebiliya	1,100	175
Ponnabatha	1,000	135

	<i>Estimated acreage</i>	<i>Duration in days</i>
Andrewsail	900	145
GEB 24	500	155
Kaima	300	175
Kesari	200	110
Kavadedoddi	100	135

( Among these *Andrewsail* GEB 24 are exotic varieties, *Kembatti* has red grains and *Sannabatha* is a fine variety. )

Some of the other varieties which are grown in smaller areas are: Deddakaima, Bonka, Kolikododdere, Jeerigesanna, Gandasale, Haribatta, Valubatha, Haludoddi, Rajakaima, Minegekesary, Karisanna, Honnesoge, Honnesinghe, Anekesari, Hasade, Kartha, Pandikartha, Porikolame, Kalme Halubiliya, Harangi, Mulla, Mothepugge, Athikraya, Bilakki, Kolikedoddi, Munikesari, Puttubatha, etc.

At the Rice Breeding Station, Ponnampet, a search for better quality rice with higher yields is being made.

**Cultivation: Seeds:** Usually a heavily manured plot is earmarked for seed paddy and the produce from that plot is harvested and thrashed separately. The harvested sheaves are left exposed to the sun and dew for three nights and three days and then thrashed and winnowed and the seed is packed in a straw basket and kept dry along with the other produce. Some growers soak it in water before sowing to separate the lighter ones. The good seeds are kept moist for three days and after germination are sown in the nurseries. But when the seed is drilled it is sown at the rate of 60-100 lb. per acre before germination. Soaking the seed in salt water to ensure well-filled and heavy grains and treating them with a fungicide is becoming increasingly popular nowadays.

**Nursery:** About ten cents of land for every acre of transplanted paddy is ploughed six times and about 2-3-tons of farmyard manure or compost are applied evenly on it. The field is puddled well and about 60-100 lb. of seed is sown after letting out all the water so that the seed is just embedded in the soft mud. After about 20-30 days when the seedlings have attained a height of about a foot the plants are ready for transplanting. However, progressive farmers sow 15-20 lb. seeds thinly in narrow seedbeds and manure them heavily to give sturdy seedlings to transplant an acre. Some damage occurs due to insects and diseases in the nursery stage, but these are effectively controlled.

**Preparation of the field and transplanting:** On a propitious day, *Vishnu Sankramana* in April, ploughing is commenced with religious rites. Ploughing is done six times, two in the dry stage and the rest in the wet condition. Ploughing is usually done between 6 and 10 in the morning and it normally takes a pair of bullocks three days to cover an acre. Ploughing after harvest and before April is tabooed on religious grounds. But ploughing the land after harvest would increase the yields. Farmyard manure is transported and stored in heaps and protected against the sun in summer months and spread and incorporated at the wet ploughing stage. About 2-3 tons of farmyard manure or compost and about 2000 lb. of green leaves are applied per acre by the majority of the people. In certain areas in South Coorg where the holdings are rather large, the preparatory cultivation is not so thorough and the use of a rotavator could be seriously considered. The seedlings are transplanted in July - August, 5-20 per hole, 9-12 inches apart. Seedlings are pulled out by womenfolk and tied up in handy bundles and are deposited conveniently all over the field. Transplanting is done by men, usually the owners themselves with the help of neighbours and hired labourers. While transplanting, the rows are kept straight and the distance between rows fairly uniform. About seven women can pull out enough seedlings in an afternoon to transplant an acre by seven men on the following day. Seedlings are planted closer in a poor soil and further apart in a richer soil. In areas subject to floods, more seedlings are planted per hole. Weeding is done only once, four weeks after transplanting. It is recommended that robust seedlings are planted only one or two per hole and weeding done more frequently to give increased yields.

**Manuring:** As already stated the fields get only a small amount of farmyard manure and green leaves. This is largely due to the fact that most of the fields yield enough produce for the consumption of the owner who also invariably possesses some plantation crop which gives more net profit per acre than rice. A combination of ammonium sulphate and groundnut cake with superphosphate or bonemeal to give upto 40 lb. Nitrogen and 40 lb. Phosphoric acid per acre has been found to give increased profitable yields by the growers. Good response to lime applications has also been noticed in the central zone running north to south. There has not been any evidence so far of response to potash.

In collaboration with the Indian Council of Agricultural Research and the Indian Agricultural Research Institute, the State

Department of Agriculture is conducting a systematic soil survey and simple manurial experiments in ryots' holdings and complex experiments in the farms to evolve a manuring scheme for the different zones.

**Pests:** *Stem borer (Schoenobius incertellus)*: The adults are nocturnal and therefore a light trap may be found useful. Clipping off leafblades to remove eggs which have been deposited already and dipping the seedlings in 0.2 percent BHC at the time of transplanting will reduce the damage. In later stages spraying with DDT minimises the loss. The pest is severe only in the Sampaje zone. *Hairy Caterpillar (Nisaga simplex)* is serious in the terraced fields of the high rainfall areas of Mercara zone. DDT sprays repeated fortnightly controls the pest. The bunds should be trimmed to destroy eggs laid on them. *Hispa (Hispa armigera)* is a serious pest in the northern parts of the State. Dusting with BHC has been found to be effective in controlling this pest. *Leptispa (Leptispa pygmoea)*: Maximum incidence of this pest is found in the early stages of rice growth and is severe in the drilled areas in North Coorg. Dusting with BHC has been found to be good. *Gall Fly (Pachydiplosis oryzae)* is not a serious pest in Coorg although it is found here and there. *Rice Case Worm (Nymphula depunctalis)* causes severe damage in the heavy rainfall zones of the State and are controlled by spraying with BHC. Gunnies dipped in kerosene is placed at the mouth of irrigation drains so that a thin film of oil is spread over the standing water in the field and a long pole held at the ends by two men is run over the standing crop causing the cases to dislodge and fall down where they are killed. *Rice Bug (Leptocorisa acuta)* is severe only in Sampaje zone and is effectively controlled by dusting with BHC. *Grasshopper (Hieroglyphus banian)* is also a serious pest in the Sampaje zone and dusting with BHC is helpful.

**Diseases:** *Piricularia oryzae*, *Helminthosporium oryzae*, *Sclerotium oryzae* and *Ephalis oryzae* have been identified to cause damage to the rice crop but the damage due to the last three diseases is negligible. *Piricularia* or 'blast' is sometimes severe in the very humid areas and in fertile fields or those which receive a unusually heavy dose of chemical nitrogenous fertiliser. All varieties seem to be susceptible to this disease. Neck infection causes complete loss of crop. In the early stages spraying with Bordeaux mixture has been useful.

**Implements:** The agricultural implements are very few and quite ancient. The plough consists of a wooden ploughshare with a iron point (*gula*), a handle of pali wood, a pole of sago palm or bamboo for the yoke. It is light and can be easily carried on the shoulder. This does not plough deep but is popular because the weak cattle that exist here can pull it easily. Another implement is the *tawe* or harrow which is only a simple board to which a thin bamboo is attached to connect it with the yoke. The cultivator stands on the board to level the wetland or pulverise the dry land after ploughing. A *mammuti* or hoe is used for trimming the bunds and a small sickle with or without a serrated edge is used for harvesting. A seed drill 4-6 tyned called *Kurige* and a single furrowed one, *Sadde*, is also popular in North Coorg. The iron plough, the puddler, the Japanese intercultivator and a hand-thresher are being popularised now.

**Harvesting:** The paddy is ready for harvest in November-December when a seven-day harvest festival *Huthri* is celebrated to bring in new rice, *pudiari*. The water is drained off the fields and the plants are cut close to the ground and left on the spot for 5 or 6 days. They are then tied up in sheaves and carried to the threshing floor and stacked with earheads inwards in a circular heap. About 7-8 labourers (men and women) can harvest an acre in a day. A month or two later the sheaves are spread on the ground with panicles topmost around a pole and are beaten with a pole and trampled by bullocks or buffaloes. The grain is winnowed and stored in large wooden attics or bamboo bins.

Some damage occurs due to rains during harvest and sometimes due to lodging of the crop.

**Production and Utilisation:** The total estimated production of paddy is about 75,000 tons of paddy or 50,000 tons of clean rice, out of which 13,000 tons get exported to Malabar and Travancore-Cochin and about 7,000 tons to Mysore. About three to four thousand tons are reserved for seed purposes. About 4000-5000 tons are sold in the internal markets while the rest is consumed by the cultivators and labourers. Some quantity is of course, lost in storage and shrinkage and some consumed by dogs and other pets. Rats and other pests do some damage to the stored grain.

Rice is the staple food of the people here. Parboiled rice is used to a limited extent only. A very small quantity is made into

beaten rice (*avalakki*). The straw is mainly used as cattlefeed and for thatching dwellings. The straw does not possess sufficient strength for making into baskets, hats, etc.

Paddy is husked by wooden pestle and mortar or by *Rate* which yields a higher percentage of broken grains. There are 19 rice mills which dehusk paddy. The husk is used as a fuel in the mills and the burnt ash as manure for paddy fields. The bran is used as cattle and poultry feed.

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#### REFERENCES

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|---------------------------------|------|---|
| Co-operative Department, Coorg, |      | Report on the marketing of rice in Coorg (unpublished).   |
| Muthanna, I. M.,                | 1953 | Coorg, A tiny model state of South India.   |
| Ramakrishna Iyer, T. V.,        | 1940 | Handbook of economic entomology, P. Varadachary & Co., Madras.  |
| Ramiah, K.,                     | 1937 | Rice in Madras, Superintendent, Government Press, Madras.   |
| Rice, Lewis,                    | 1878 | Mysore and Coorg, A Gazetteer compiled for the Government of India, Volume II, Coorg, Mysore Government Press, Bangalore. |
| Yegnanarayana Iyer, A. K.,      | 1939 | Report on the enquiry into the Agricultural and Veterinary needs of Coorg, Manager, Government Press, Simla.              |