

## Planting Techniques And Alternate Mulches For Enhancing Soil Moisture Retention And Productivity Of Rainfed Ginger (*Zingiber Officinale* Rosc.)

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### ABSTRACT

A field experiment was conducted during 2001-02 and 2002-03 at Research farm of CSWCRTI, Research Centre, Sunabeda, district Koraput (Orissa) to find out the most suitable planting technique and alternate mulch materials in rainfed ginger (*Zinger officinale* Rosc.). Beds laid across the slope recorded significantly higher soil moisture retention than the beds along slope on each date of observation. Average rhizome yield (71.12 q/ha) net returns (Rs. 64,293/ha) and B:C ratio (1.69) realized from the former treatment was 8.38, 23.21 and 7.64 per cent higher than the latter. Average rainfall water use efficiency was also 8.64 per cent higher in beds across the slope than beds along the slope (6.40). Among mulches, paddy straw retained highest soil moisture but yield wise *Gliricidia* mulch with rhizome yield of 72.93 q/ha proved significantly superior to paddy straw (67.33 q/ha) and lantana (64.86 q/ha). Average net returns (Rs. 69,095/ha) and B: C ratio (1.76) were also highest with *Gliricidia* mulch. Highest rainfall water use efficiency was again observed with *Gliricidia* mulch (7.15 kg/ha/mm).

**Key Words:** Planting technique, alternate mulch, Rainfed ginger, Soil moisture retention, Ginger yield

### INTRODUCTION

Eastern Ghat High Land Zone (area 9.55 lakh ha) of Orissa lying between 18° 2' to 20° 10' N latitude and 81° 0' to 83° 20' E longitude is situated at an altitude ranging from 300 to 1000 m. Climate of the region is warm and humid with mean summer maximum temperature of 34.1°C and mean minimum temperature of 7.5°C. Among the various crops, cultivation of ginger in rainfed uplands is remunerative and commonly practiced by the tribal farmers because of its high profitability and the region's climatic and edaphic suitability. Because of erratic or untimely rainfall, the crop is subjected to moisture stress especially during later growth stages. Eighty per cent of annual average rainfall of 1365 mm is received during monsoon and rest is sporadically distributed during remaining part of the year, which barely synchronize with water requirement of ginger. Consequently, yield (19.81 q/ha) of ginger is very low Anon., (2001). Thus, moisture conservation techniques and bed orientation are imperative for maximizing the use of rainfall and augmenting the productivity of rainfed ginger. The farmers lay out the ginger plots along the slope in the sloping uplands, which causes high and quick loss of rain water as runoff. Planting technique which facilitates infiltration of greater portion of rainwater into the soil and reduces loss of rain water as runoff is essential.

Mulching is another dependable tool for enhancing and prolonging the availability of monsoonal residual

moisture. Incorporation of organic mulches has been reported to augment water retention capacity by improving the structure and physical environment of the soil. Various mulches have proved efficient in moisture conservation in different rainfed pockets of India as reported by various workers. Chaudhary and Acharya (1993) reported that lantana mulch in silty clay loam alfisols retained 32 per cent moisture as compared to 9 per cent under no mulch treatment during 50 days of study. Similarly, in red laterite silty clay loam soils, the paddy straw mulch retained 18 per cent moisture as compared to 9 per cent under no mulch treatment (control) during 61 days of study Singh *et.al.*, (1998). Similarly, Mohanty *et al* (1998) and Mishra *et al* (2000) reported that application of mulch increased turmeric yield by decreasing soil erosion and thereby enhancing the availability of applied inherent plant nutrients in foothill slopes of Eastern Ghat High Land Zone of Orissa. However, soil moisture conservation depends upon soil type and climatic conditions Parihar *et.al.*, (1968), porosity and thickness of the mulch Acharya and Parihar, (1969) and evaporation stage Bond and Willis, (1969).

In this paddy-growing zone, paddy straw is used as mulch in ginger. But a very high cattle (7,14,427) and bovine (2,13,503) population compel the farmers to use paddy straw as animal feed. Moreover, it is used for making thatched houses. The situation invokes for identification and testing some alternate mulch materials. In-spite of

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