## **2.4 Direct seeding of Rice**

In the Direct Seeding method of crop establishment, the rice seeds are sown directly in the field. Direct seeding of rice is practiced in both wet and dry soil as wet direct seeding and dry direct seeding and water seeding through broadcasting, dibbling, drilling or sowing of seeds in lines (IRRI Rice Knowledge Bank, 2018). Wet direct seeding is the method of sowing pre-germinated rice seeds in to the puddled soil whereas sowing of dry seeds is practiced in Dry direct seeding of rice. The seeds are sown in the standing water conditions at the Water seeding method which is sub divided in to aerobic and anerobic according to the oxygen content available in the ambient water of the germinating seeds (Hassan Akhgari, 2011). Dry direct seeding is practiced in the areas which are prone to floods and in low lands, uplands where rainfed paddy cultivation is done. The lands where irrigated cultivation of rice is done commonly used the Wet direct seeding method (Pandey et al., 2000).

The cultivation of rice through direct seeding is widely practiced in America, Russia, Japan, Cuba, India, Western Europe including Italy, French as a result of the shortage of skilled labor and high wages demanded by them (Anjana et al., 2016). Although in the Asian region farmers mainly followed the traditional transplanting method of rice, at present the farmers tend to adopt to the direct seeding as a compensation to the increasing labor shortage and high costs on wages. As a result of that the cultivated land area of rice under direct seeding in the Asia is rapidly increasing as aim of the farmers to increase the production and the profitability (Pandey et al., 2000).

The area under direct-seeded rice has been increasing as farmers in Asia seek higher productivity and profitability to offset increasing costs and scarcity of farm labor.

Rice is direct-seeded by essentially two methods (dry and wet seeding) based on the physical condition of the seedbed and seed (pregerminated or dry). Dry seeding is practiced in rainfed lowland, upland, and flood-prone areas. Wet seeding is a common practice in irrigated areas, and it is further subdivided into aerobic wet seeding, anaerobic wet seeding, and water seeding, based on the level of oxygen in the vicinity of the germinating seed or the depth of flood- water at seeding. Seeds

Direct seeding offers such advantages as faster and easier plant- ing, reduced labor and less drudgery, earlier crop maturity by 7–10 d, more efficient water use and higher tolerance of water deficit, less methane emission, and often higher profit in areas with an assured water supply. Although labor and its associated costs may be re- duced for crop establishment, other technologies are essential to overcome constraints imposed by direct seeding. For example, we should enhance the interaction of crop stand establishment, water management, and weed control in relation to crop lodging in both dry- and wet-seeded rice. Technology for land preparation, precision leveling, and prevention of crop lodging must be improved in wet direct-seeded rice. Similarly, management practices and control strat- egies are currently lacking for several pests (rats, snails, birds, etc.) that damage surface-sown seeds and for problem weeds that com- pete with rice seedlings

Direct seeding is becoming an attractive alternative to transplanting (TPR) of rice. Asian rice farmers are shifting to direct seeding to reduce labor input, drudgery, and cultivation cost (De Datta 1986, De Datta and Flinn 1986). The increased availability of short-duration rice varieties and cost-efficient selective herbicides has encouraged farmers to try this new method of establishing rice

Dry seeding

The broadcast sowing/row seeding/drilling/dibbling of dry rice seeds on dry (or moist) soil is called dry seeding.

Water seeding

Pregerminated seeds are sown directly into water depths of 20–40 cm

Weed pressure is often two to three times higher in D-DSR than in transplanted crops.

Compared with TPR, the outbreak of insect pests and diseases is more severe in W- DSR because of high plant density and the consequent cooler, more humid, and shadier microenvironment inside the canopy

Direct seeding:research issues and opportunities

Traditionally, rice is transplanted, but consistent increase in labour cost

in recent

times, calls for other planting

methods. As a result of increased labour cost, planting systems is gradually being replaced by direct sowing in many developing countries (Dawe, 2003; Naklang, et al., 1996).

The comparatively low paddy yields recorded especially in pre-germinated seed broadcasting methods than seedling transplanting method could have been due to exposure of seeds to pest destruction and weed competition in broadcast conditions. It could be some of these problems of rice broadcasting that Damkheong, et al., (1980) indicated,

“ DIGANG ” RICE ( Oryza sativa L .) UNDER UPLAND CONDITION OF BAWKU , UPPER EAST REGION , GHANA

Broadcasting Sprouted Seeds in Puddled Land This method is adopted in an area where agricultural labourers are not easily available for

transplanting or some time labourers are very expensive. In this method field is prepared and puddled just like in the case of transplanting. About

(Oryza sativa

Direct

seeding is not feasible due to decreasing water availability for agriculture

Availability of nutrients and moisture in direct seeding has been low due to the presence of more number of weeds and shallow plant root growth (Craigimiles et al. 1968; Ramamoor thy et al. 1974) FP

per panicle was produced by the DSBSW treatment. Less number of grains per panicle in direct seeding might again be explained in terms of low availability of moisture and nutrients at grain formation stage. The availability of moisture and nutrients was low due to the fact that there were more number of weeds in direct seeding and also roots of plant could not penetrate deep enough to exploit the soil resources fully (Jana et al. 1981; Singh et al. 1981).

COMPARISON OF DIFFERENT PLANTING METHODS FOR OPTIMIZATION OF PLANT POPULATION OF FINE RICE ( Oryza sativa L .) IN PUNJAB ( PAKISTAN )

At present, rice cultivation is as direct seeded in America, Western Europe such as Italy and French, Russia, Japan, Cuba, India, Korea, and the Philippines and in some parts of Iran, due to high technology, high labor cost and shortage of skilled labor (Akhgari,2004).

Direct seeded rice: purely a site specific technology

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