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Floating Rice Cultivation In Future Prospects

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ARTICLE ID: 037

Deepwater rice is also known as floating rice – is native to the Mekong River Delta, and in the past was grown widely across its floodplains in Vietnam. Floating rice held significant cultural, ecological, environmental and historic value. Before 1975, the total area of floating rice was estimated to be greater than 500,000 hectares; by 1994, this had reduced by 80 percent, and as of 2012 only very small pockets of tens of hectares remained in production. The high yielding rice varieties have increased which leads to agricultural intensification, water scarcity, and agrochemical pollution. In a new initiative, farmers with support from researchers and local government, plan to re-expand the area under floating rice cultivation. The farmers plan to develop niche markets for the rice grain in Vietnam and abroad, and create an eco-tourism centre.

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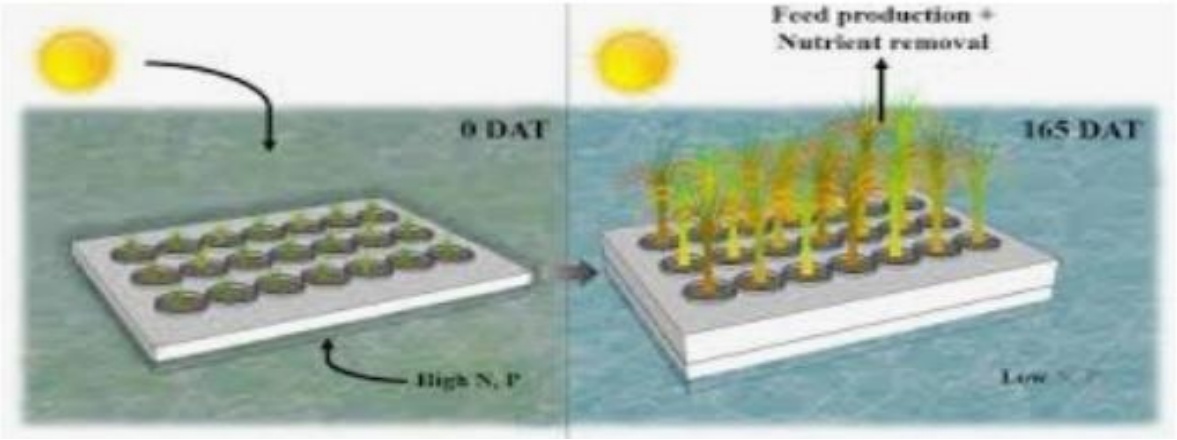
Deepwater (floating) rice has three special adaptations: (i) ability to elongate with the rise of water levels; (ii) develop nodal tillers and roots from the upper nodes in the water; and (iii) the upward bending of the terminal part of the plant called 'kneeing' that keeps their productive parts above the water as the flood subsides. Deepwater rice grows under rainfed dryland conditions for 2-4 months before the onset of flood when the plant produces basal tillers. With inundation, the plant becomes an emergent macrophyte and grows in an aquatic environment for the remaining 3-5 months of its life. Nodal roots absorb nitrogen, phosphorous and possibly other nutrients from flood-water.



Floating rice- culture system for nutrient remediation

Deepwater rice is usually seeded dry in the field during March-April following the first monsoon shower. In some areas farmers establish deepwater rice by transplanting of seedlings following dry season rice. Until the onset of flooding in June/July, the crop depends on rain. Very little fertilizer is used and weeds are controlled by harrowing and hand weeding, twice before flood. The crop matures between mid-October and mid-December, depending on the degree of photoperiod sensitivity of the cultivar. Depending upon the cultivars, the plant population usually reaches the highest level of 200-400 stems per sq m at the maximum tillering stage in the pre-flood period. During the flooding period, some stems may be damaged by submergence and pest attack. Grain production tends to increase with the increase in biomass up to 12 m tons/ha(dry weight). The harvest index typically varies from0.12to0.16 and tends to increase in shallow water situations. Heaviest panicles are borne on the main tillers followed by basal tillers, and the lightest panicles by the nodal tiller. Panicle density usually varies between 50 and 120 per sq m. Average grain yields are 2.3

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mtons/ha and some cultivars have the potential of producing yields more than 3.0 mtons/ha (Banglapedia, 2014).

To contain the water stagnation problem under this ecology, varieties should have some suitable features, such as height of 115-130cm, stiff culm, erect leaves, drought tolerance at seedling stage, submergence tolerance with less elongation and without culm elongation and strong seed dormancy. A recent cultivar named Swarna Sub1 was developed via marker-assisted selection, with the ability to withstand prolonged periods of around 14

Floating Rice in Ecosystem - services	**Supporting Services** Maintenance of water regime and silt deposition for soil formation **Provisioning Services** NTFPs, firewood, inland fish. Preservation of natural rice genetic material, & other plants & animals **Regulating Services** Preservation of directly flooded 'clear' forest for flood regulation, habitat and biodiversity, soil and water quality maintenance Preservation of agro-biodiversity of faun and flora in paddies Maintenance of water quality through no chemical residues **Cultural Services** Preservation of spiritual practices and value of agricultural landscape, eg paddies with palm trees

days beneath a flooded plain. The submergence tolerance ability of this variety is conferred by the presence of the Sub1A gene, introgressed from the Indian cultivar FR13A into the flood-vulnerable (but high yielding) cultivar Swarna (Debrata and Sarkar, 2012; International Rice Research Institute, 2013b).Vast rice-growing regions in India, Bangladesh, and other

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countries, which are submerged during rainy season and rendered useless for rice production, have been made productive since the SUB1 gene that makes riceflood-tolerant was discovered and bred into popular existing rice varieties. This variety has been very popular, with 1.7 million hectares of land in India having SwarnaSub1 and other flood-resistant varieties used instead of conventional rice crops(International Rice Research Institute, 2013c). Jalmgna, jalanidhi, jalapriya and Hangeswari varieties are suitable for deepwater rice areas.

Future prospects

The Unique floating rice agro- ecological system and the situational knowledge associated with it. Fortunately, the importance of preserving and developing the floating rice- vegetable farming system was recognised in March 2012, in particular for activities. The Department of Agriculture and Rural Development (DARD), aim to conserve and expand the area of floating rice production from to 100 hectares by 2015 to 500 hectares by 2030.

Economic benefits:

Regarding economic benefits, although the yield of floating rice is quite low, the net return is relatively higher than that of the winter-spring and summer- autumn high- yield variety rice crops grown by other farmers and results in reduced agrochemical use that brings food safety and health benefits.

Environmental benefits:

Floating rice creates large amounts of staw which in the dry season is used as a mulch to cover soils on which vegetables are grown. This conservers soil moisture that is then utilized by these crops.

CONCLUSION

The selection of suitable flood resistant varieties plays crucial role in flood prone areas to have better productivity. The breeding and agronomic management strategy should consider intensification as well as diversification of the farming system in flood-prone area along with increasing the productivity of the rice crop.