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Status of Jumli Marshi in Nepal

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Abstract
Jumli Marshi, an indigenous rice variety of Nepal, is grown at the highest elevation of the world at an altitude of 3050 masl. The International Rice Research Institution has confirmed the presence of cold tolerant gene in this variety that supports it to thrive well in cold temperate condition. This is the only variety of rice that was grown in Jumla few years back. This variety is very susceptible to blast. It has been in very critical situation with an increasing incidence of blast resulting massive loss in the yield for last some years. So, need of varietal diversity of cold tolerant rice to substitute the single local one in Jumla was visualized long ago. Keeping this in mind, NARC released 2 other varieties with cold tolerant genes- Chandanath-1 and Chandanath-3 which are red and white rice respectively. These varieties have been brought to meet the demand of farmers after long concentrated research efforts. These new varieties have been found suitable for Jumla as they are high yielding, blast disease resistant, cold tolerant giving high rice recovery. Chandanath-3 is becoming more popular in Jumla and its yield increase is more than 50% as compared to Jumli Marshi, but problem regarding it is that it doesn't last longer after eating. People prefer to eat Jumli Marshi as it has high nutritional value, soaks up milk and ghee and becomes sweet in taste.

Keywords: Jumla, Jumli Marshi, Rice

Introduction
Jumla is one of the 77 districts of Nepal. Rice cultivation in Jumla ranges from 2400-3050 m altitude, which is the highest elevation in the world (Paudel, 2011) [2]. The high mountains of Nepal are rich in cold tolerant genes in rice. The highest elevation at 3050 m is Chhumjul of Jumla, where rice is cultivated in Nepal. There is a famous saying "Rice brings all Asians together". This reflects the importance of rice in the lives of all Asians. Culturally also, rice is attached from cradle to crave. Rice is used as cooked rice, popped rice, ring bread, laddoos, local beer and so on.
Jumli Marshi, a japonica indigenous rice variety is grown here. It is believed that Baba Chandan Nath brought rice to the Jumla valley some 12-13 years ago. Jumli Marshi has a cold tolerant gene that supports it to thrive well in cold temperate condition (http://www.narc-nepal.org, 2002). This is the only variety of rice that was grown in Jumla few years back. Rice cultivation practice in Jumla is quite different from those in other places.

Time and practice of raising nursery bed
In Jumla, every year, on 25th March, rice seeds are soaked in jute bags and incubated near fire place for 4-5 days by covering them with jute bags before sowing seeds in wet seeded beds. During this, maximum temperature of Jumla is about 27-28 ^{0}C whereas minimum temperature is about 5-6 ^{0}C (Paudel, 2011) [2]. Then, on April 3, the sprouted seeds are taken out from the jute bags and are broadcasted in the wet nursery beds. Then, FYM and leaf litters are spread evenly covering the sprouted seeds. Soon after that, the ashes from burning of dried cow dung are also spread 1-2 times thinly over the nursery. This practice helps to maintain sufficient temperature for emergence and growth of seedlings.

Field preparation and transplanting
Jumli rice is transplanted in the well puddled field. Mostly, 2 ploughing is done; first immediately after harvest of barley and second is done at the time of transplanting. Mostly, operations like puddling, bund making, field preparation are done by males and operations like pulling seedlings from nursery beds, transporting them to the main field, transplanting, weeding are done by females. About one month old seedlings are transplanted from May 28-June 12 keeping one seedling per hill with a distance of 5-7 cm hill-hill.

Irrigation and Intercultural operations:
Continuous flooding irrigation is practiced right after transplantation. Irrigation is stopped at

the end of August for about 45 days whereby rice paddies dry up during this period.

Mostly, two manual weeding are sufficient to remove the weeds. First weeding is done by females 15-20 days after transplanting whereas males remove the weeds floating on water by using wooden plank. Then, second weeding is done in next 30-40 days after transplanting.

Farmers don't use any chemical supplies like weedicides, pesticides there in Jumla. So, in 2009, Jumla was declared as an organic farming district (Paudel, 2011) [2].

Intercropping in the rice bunds

Bunds are prepared at the time of transplanting in the irrigated paddy fields. Local varieties of soybean such as Muse, Sathiya, Bikase are used for intercropping and are sown in the paddy fields within a week of transplantation. These soybeans are harvested at the time of harvesting of rice.

Plant protection

Jumli Marshi suffers from different insects, pests and diseases. It is very susceptible to blast. Blast severely damages the rice field causing heavy loss. So, to overcome the blast disease, NARC developed two rice varieties Chandanath-1 and Chandanath-3 which are tolerant to blast.

Harvesting and storage

Rice is harvested upto the end of October. Harvesting of rice is like a local festivalof this region. It starts from first week of October and ends upto second week of this month. Harvesting is done by cutting the tillers leaving 5-7 cm stubbles for rice straw. This rice straw is a valuable fodder to animals. Then, rice is staked in small bundles for manual threshing. This threshed straw is treaded by bullocks so that there is complete exhausting of grains from panicles.

After harvesting, this is stored by making trenches inside house. The trenches are bedded with Tadis patra *(Abis spectabalis*) in the bottom and mixture of cow dung, clay soil and litters are pasted on the side wall and mouth is covered with wooden plank lid. It has been reported that the taste of rice becomes more palatable even after 2-3 years in temperate condition.

Reasons for its low production

1. This variety of rice is very susceptible to blast that causes massive loss in the yield. This blast has led it to the state of extinct.
2. Due to opening of road from Surkhet, the fertile land is being converted into concrete land, thereby decreasing the land area for cultivation.
3. Cultivation of this rice is limited to small areas in specific locations only.
4. Lack of quality seeds and increased migration of people
5. Lack of research and other activities in this area
6. Frequent rainfall and hailstone result in grain shedding

Solutions

1. Pureline selection
2. Improving post-harvest technologies
3. Identifying the gaps and initiate strategies for ensuring the multiplication of breeder seed to certified seeds and training the farmers in seed production practices
4. Supply of high quality inputs
5. Development of transportation and communication facilities
6. Providing some amount of money as compensation to those farmers who are interested in its cultivation to meet their expenditure.

Activities done by government

The Jumli Marshi is the only variety grown in the location that has been in very critical situation with an increasing incidence of blast resulting massive loss in the yield for last some years. As a result, farmers faced heavy loss and they were discouraged to cultivate this rice. So, need of varietal diversity of cold tolerant rice to substitute the single local one in Jumla was visualized long ago. Keeping this in mind, Nepal Agricultural Research Council (NARC), released two other rice varieties with cold tolerant genes, Chandanath-1 and Chandanath-3 which are red and white rice respectively. These two varieties have been brought out after long concentrated research efforts to meet the demands of the farmers. These new varieties have been found suitable for Jumla as they are high yielding, cold tolerant, blast disease resistant, good tillering, easy to milling, good for taste, giving high rice recovery, better straw yield, less damage by hailstones, low shattering loss.

Activities needed to be done

Often it is very difficult to even retain the produce for seed purpose. Since long time farmers are either using their own saved seeds or are sharing with each other, the continuous use of same seeds is resulting in seed deterioration. Despite of being aware of its low productivity, farmers grow it for personal consumption. Though government has released two varieties, people prefer to Jumli Marshi because of its high nutritional value, soaksup milk and ghee and become sweet in taste whereas the other variety doesn't last longer after eating

Conclusion

It was reported that improved series of Chandanath required long growing period of 180 days and these have been affected with cold injury in the reproductive stages of grain filling and maturity (Sapkota, 2010) [3]. To enhance rice production in high altitude regions of Jumla, there is a need to promote early maturing (160 days) rice varieties similar to that of Jumli Marshi.Also, it is rich in quality traits and is important source of germplasm for varietal development in future. At the same time, it is in the process of disappearanceand less work has beendone for its improvement and diversification. Hence, such a typical organic rice production system in the highest elevation of the world needs immediate attention of all institutional authorities (GOs, NGOs, INGOs) concerned to conserve it for future generation.

Reference

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