Improved Varieties in Fennel

Fennel (Foeniculum vulgare Mill) belongs to the family Apiaceae. It is originated in Southern Europe and Mediterranean region and widely cultivated in Romania, Russia, Germany, France, Italy, India, Argentina and USA. Fennel producing states in India are Gujarat, Rajasthan, Karnataka, Maharashtra, U.P., Punjab and Bihar. Gujarat and Rajasthan are the major fennel producing states. The essential oil in Fennel is in a range of 1.5 - 6.5 percent, yellowish green liquid, which having main constituents are 50-60 percent, anithole and 10-25 percent fenchone. The chromosome having 2n=22.

Seed replacement rate (SRR) is about 10-14% in fennel, and is very low. Therefore average productivity in fennel is found to be 17 q/ha where its potential yield is found to be 24-30 q/ha and there is a huge gap between exiting yield and potential yield. Suitability of variety for any agro ecological zones depends on its adaptability to the particular soil and climatic condition and should have resistance and tolerance against biotic and abiotic stresses prevailing in the respective region.

There are many varieties released for cultivation to different areas through AICRP on spices. A brief description of each variety is given as under:

1. Rajasthan
   a) Ajmer Fennel 1 (AF-1): This variety has been developed at NRCSS, Ajmer and is suitable for early sowing. It can also be cultivated as a rabi crop. The plants are erect and tall, bearing large size umbels. The seeds are attractive bold, medium sized, fragrant with volatile oil content up to 1.6%. The early sowing produce an average yield of 1950 kg/ha and 2510 kg/ha when grown as rabi crop. This variety is tolerant against Ramularia and Alternaria blight.

   b) Ajmer Fennel-2 (AF-2): This variety has been developed at NRCSS, Ajmer and identified for release at national level in 2016. It is suitable for both early sowing and as rabi crop. The plants are erect and tall, bearing large size umbels. Its seed contains 1.9 % essential oil. The variety produce average yield of 17.9 kg/ha during rabi crop and is tolerant against Ramularia blight.

   c) RF-101: It has been developed by SKN college of Agriculture (RAU), Jobner, through recurrent half sib-selection from a local collection Jobner and released in 2001. The plants are tall erect, with stout stem. It bears large umbel with long bold grain. It’s seed content is with 1.9 % essential oil.

26 September 2016
It matures in 150-160 days and gives an average yield of 1400 kg/ha.

d) RF-125: This selection is also from RAU, Jobner, through recurrent half sib selection from an exotic collection, EC-243380 from Italy and released in 2003. The plants are early, short statured with compact umbels and long bold 1700 kg seed yield per hectare. It matures in 110-130 days. Essential oil in seed is 2.78 %. Plants are short statured with compact umbels and long bold seeds.

e) RF-143: It has been developed by RAU, Jobner, through recurrent selection from individual plant progeny. It is medium tall and is recommended for loamy and black soil. It gives 1200 kg seed yield per hectare. Essential oil in seed is 1.87 %.

f) RF-205: It was developed by RAU, Jobner and released in 2009. It gives maximum 29.45 q/ha seed yield (AIRCPS, 2016).

g) RF-178: It was developed by RAU, Jobner. It gives 18-19 q/ha seed yield.

h) RF-281: It was developed by RAU, Jobner and released in 2012. It gives 18-19 q/ha seed yield.

AICRPS studies conducted at Jobner during 2015-16 reported that RF-143 recorded maximum seed yield of 29.29 q/ha followed by RF-101 (27.27 q/ha), RF-281(26.51 q/ha), RF-205 (26.37 q/ha), FNL-82 (26.07 q/ha) and FNL-80 (25.46 q/ha) and lowest yield of 5.74 in FNL-88.

2. Gujarat

a) PF-35: It was developed by Gujarot Agriculture University through selection from Pilwai local germ plasm in 1973. The plants are tall and spreading with medium sized hairless and green seeds. It is moderately tolerant to sugar diseases, leaf spot and leaf blight. The seed contains 1.9 % essential oil. It matures within 215-225 days and gives an average yield of 1289 kg/ha.

b) Gujarat Fennel-1: It was developed at Spice Research Centre, (Gujarat Agriculture University) Jagudan, through pure line selection from vijaypur local and was released in 1984. The plant is tall and bushy, shattering and lodging, oblong, medium bold and dark green seeds and is suitable for early sowing and rabi crop. It is reasonably tolerant to drought, moderately tolerant to sugary disease. The seed contains 2.2 % essential oil. It gives 1695 kg/ha seed yield and mature in 158 days.

c) Gujarat fennel-2: It is a high yielding variety developed at Spice Research Centre, Jagudan, Gujarat Agriculture University, Banaskantha, Gujarat and was released in 1997 through pedigree selection of local genotype. This variety is suitable for cultivation during rabi season under irrigated condition. It produces yield of 1940 kg/ha. The seed contains 2.4 % essential oil and the plant is matured within 159 days.

d) Gujarat fennel-11: It is a high yielding variety developed at Spice Research Centre, Jagudan, Gujarat Agriculture University, Banaskantha, Gujarat and was released in 2004 through recurrent selection based on individual plant progeny performance. This variety is suitable for cultivation during rabi season under irrigated condition. It produces a yield of 1940 kg/ha. The seed contains 2.4 % essential oil and the plant will be matured in 159 days.

The trial of AICRPS conducted in 2015-16 at Jagudan, reported that FNL-77 produced highest yield (15.42 q/ha) followed by RF-205 (13.62 q/ha), RF-201(12.64 q/ha) and GF-12 (13.38 q/ha) respectively.

3. Haryana

a) Hisar Swarup: It was developed at Haryana Agricultural University, Hisar. This is a mass selection from indigenous germplasm of Haryana and has a yield potential of 1600 kg/ha. The plant grows upright, and spreads around giving a bushy appearance. It is late in maturity taking about 175-
Pepper Cultivation: An Andaman Experience

Ajit Waman, Pooja Bohra, D. Basantia and B.L. Kashinath
Central Island Agricultural Research Institute (ICAR), Port Blair, Andaman and Nicobar Islands, Pin: 744101
email: ajit.hort593@gmail.com

Mr. K.R. Radhakrishnan Nair is a model farmer to the pepper cultivators of Andaman and Nicobar islands. In his plantations, he cultivates pepper as an intercrop among other several crops. His farm is a good example of intercropping and mixed cropping patterns of cultivation. His farms are located in the Dharmapuri village of North and Middle Andaman district of Andaman and Nicobar Islands.

Mr. Nair was born in Alappuzha district of Kerala and his family migrated to Andaman Islands during 1955. He has been successfully cultivating black pepper for as a dynamic farmer in the locality. His devotion for agriculture is such that he postponed the construction of his house for several years and instead, constructed a farm shed, which is being used for various pre and post-harvest operations. Initially he had only a few pepper plants. As per the advice of the officers of the Department of Agriculture, Andaman and Nicobar Administration, he established a well-developed intercropping plantation with more than one thousand plants. Later, area under cultivation was expanded and now has about more than two thousand plants in his farm.

185 days. The plant is resistant to lodging and shattering. Its grain fruits are long, bold and has oil content of 1.6%.

b) HF-143: It was developed at HAU Hisar, Haryana and was released in 2012. This variety surpassed all other varieties with an average yield of 1,779 kg/ha. It needs only 150 days for maturity. The trials of AICRPS (2015-16) at Hisar maximum yield recorded was 20.91 q/ha in FNL-84 followed by FNL-83 (20.33 q/ha)) and FNL-88 (19.22 q/ha).

4. Tamil Nadu

Co-1: It was developed by Tamil Nadu Agriculture University, through reselection from PF-35. It is medium stature, diffuse branching and is suitable for intercropping and border cropping with chilli and turmeric. This variety is drought prone, resistant to water logged, saline and alkaline conditions. It matures in 210-220 days and gives an average yield of 570 kg/ha.

5. Bihar

Rajendra Saurbha: It was developed by SKN College of Agriculture (RAU), Jobner and was released in 2000. It gives 18-19 q/ha seed yield.

Fennel is a major spice crop. Farmer can select high yielding varieties based on yield and disease resistance. More yields can fetch more profit from foreign exchange through export.
Andaman and Nicobar Islands are a group of 572 islands located in the Bay of Bengal. The soil and climatic condition of islands are well suited for cultivation of a number of perennial and rhizomatous spice crops. Black pepper is one of the important spice crops grown in the Andaman and Nicobar Islands and about 800 ha area is under its cultivation in the islands, which is 47.6 percent of the total area under spice crops. Coconut and arecanut are the major horticultural crops occupying 26,130 ha area i.e. more than half of the total agricultural land (NHB database, 2015). This provides ample scope for area expansion of pepper as an intercrop.

Instead of raising the nursery, he directly collects 3-4 node cuttings from the hyper productive old vines of pepper from his own plantation and directly plants these cuttings in the intended places. The plants are trailed on coconut, areca nut and gliricidia. Though it is a general practice to plant the gliricidia at the onset of monsoon, Mr. Nair does this during the months of December-January, which is a dry season in the Andaman and Nicobar Islands. The survival of such standards is about 80 percent.

He acclaims that his produces are of non-chemical origin, though he doesn’t possess any organic certification. For the organic cultivation a vermi-compost unit is established in the farm. He makes vermicompost using the agricultural residues from banana and arecanut. He applies four liters of vermi wash per month to each plant in two split doses, in addition to the application of vermicompost (1.5 to 2.0 kg/ plant) during rainy season.

For harvesting the pepper, he uses ladders of different heights made from locally available bamboos, which he cultivates in his farm. This generates an additional income of Rs. 15,000 per year by selling the bamboos to the neighbouring farmers. He harvested about 222 kg dried berries last year, which he sold at the rate of Rs. 650 per kg. The yield would increase in the coming years as many of his plants are of different age groups. He proudly exhibited a couple of vines, which produced 10 kg & 16 kg of fresh berries in the last year. He is also supplying the planting material to the nurseries of Department of Agriculture.

He is well aware of the importance of water conservation and has constructed check dams in his farms without waiting for the support from any external agency. Dropped fruits of pummelo, breadfruit, banana in addition to the banana leaves are used as the fish feed for rearing fishes in his pond, which he had constructed in the farm. This generated an additional income without any expense for fish feed.

Though the climatic conditions of the islands are well suited for the cultivation of black pepper and the islands receive about 3,100 mm rainfall each year, new improved varieties/hybrids have not been introduced for commercial cultivation in the pepper gardens. With the help of ICAR-CIARI, Port Blair, a few improved varieties have been introduced in his farm and he is waiting for the results. He is the center of attraction at the extension activities and other functions organized by ICAR-CIARI, Port Blair, Krishi Vigyan Kendra, Nimbudera and the State Agriculture Department.

He is willing to extend all the possible technical help for establishing commercial pepper gardens in the islands. He hopes that this would promote healthy competition among the growers and thereby boost up the productivity and quality of the pepper in the islands.

Spice India English

Spices Board participated in the 20th National Exhibition held at Surer Math, Dum Dum, Kolkata from 10th August to 14th August 2016. Mr. A.K. Paul, Daftry, & Mr. Susanta Halder, Sr. Clerk represented the Board in the stall. Due to torrential rains the number of visitors was less than expected.

30 September 2016