

*Documentation of Innovative Technologies &
Methodologies by
Farmers in Solapur District (M.S.)*



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KVK, Solapur (MS)
DETAILS OF INNOVATIVE FARMER

Details of Innovation / methodologies designed and developed by Innovative Farmers which are successfully benefited the system:

Solapur district of Maharashtra is well known for its drought prone nature with an average annual rainfall of less than 530 mm. Its geographical & climatic conditions deserve for a sturdy crop to cultivate Custard Apple, which is sturdy in nature and requires less water. Mr. N.M. Kaspate, a "Krushinista" award winner, is a Grape, Custard Apple & Ber grower from a Solapur district engaged in agriculture since last 25 years. He has also been awarded Late Vasant Naik Maha-Grape, Pune Exporter Award in 1997-98 for his excellent work in Grape export. While cultivating Grapes, he also planted Ber & Custard Apple on his farm. He started Custard Apple cultivation in the year 1988-99 with the "Balanagari" variety and he had collected other varieties from other states also.

While doing the farming, his curiosity for change and finding innovative things provided him a chance to select or to develop a new selection from his Custard Apple museum. He has some recommendations on the basis of his 22 year experience of Custard Apple cultivation as follows:

KVK Intervention:

Since 2001-02 the KVK, Solapur gave advisory and moral support to Mr. N.M. Kaspate for development of new selection and refinement of package of practices of Custard Apple production. Mr. Kaspate is a member of Technology Transfer Club of KVK since last 7 years. KVK, Solapur invited him many times in different programmes for giving the benefit of his experiences to other farmers about dry land fruit farming. Scientists of KVK, Solapur participated in number of programmes organized by Mr. N.M. Kaspate & Custard Apple growers association in the interest of farming community. KVK, Solapur felicitated Mr. Kaspate on many occasions for his tremendous efforts for development of innovation to minimize the pains of common farmers.

1. Brief description of the innovation by the farmer:

Mr. N.M. Kaspate has developed the selections from his Custard Apple museum as follows.

- a) Annona-2
- b) NMK-1
- c) NMK-2
- d) NMK-3
- e) Finger Prints

a) Annona-2: This is the selection on which he has been working since last ten years and having the characteristics of more weight, late maturity period (5-7 months), good keeping

quality, less losses due to over ripening (harvesting period can be increased up to 20-25 days without disturbing the quality & appearance of fruit) less number of seed (20-25) per fruit, Pulp percentage is more than other variety (70-75%), TSS percentage is 28-30%, soft & taste pulp, easy to eat (can be eaten with spoon), pulp is easily separated from the seed which reduces the uneasiness during eating, which is commonly observed in other varieties.

Leaf size of the annona-2 is more than other varieties. The average size of leaf is 7-9 inch in length which can be goes up to 12 to 13 inches.

b) He strongly recommended that the spacing for plantation should be 10 x 15 ft. rather than recommended 16 x 16ft. to develop microclimate & enhance the pollination by attracting insects. According to his experience hand pollination practice was found superior enhance fruit setting at early in the morning between 6 to 9 am.

c) '**Annona-2**' selection of Custard Apple has required the heading back practice at the height of 2 to 2.5 ft., which helps for speedy growth of side branches and alternatively it gives more number of fruits.

d) He recommends that thinning operation is must to keep proper number of fruits & also to get good quality fruits e.g. 100 to 125 fruits / plant should be kept on 'Annona-2' selection with 8 to 10 year old orchard.

e) His experience taught that, if water stress of 4-5 weeks during April-May for Annona-2 selection orchard is needed for getting good quality fruits in off season (late) as compared to traditional practice .

f) Mr. N.M. Kaspate had also developed 'NMK-1' selection. He is working on this selection for last 8 years i.e. since from 2002. This selection has special features, which are as follows:

- Very attractive colour, size and optimum number of fruits / plant.
- Excellent for export because of its uniform size i.e. 75 to 80% fruits of same size.
- Harvesting time can be adjusted according to market prize & cargo facilities because of the special characteristics of matured fruit. The fruit will remain in good condition (i.e. un-ripped) for at least 20-25 days on plant it self.
- Non rupturing quality of fruits kept the fruit in good condition for 4 days after harvesting. The fruit of NMK-1 get ruptured only when it forcefully ruptured or cut. Naturally this fruits cut or ruptured from petiole side only.
- The berry size is big & the colour of the fruit is golden yellow and as such it fetching good prize in the market.
- Pink colour between two berries attracts the customers quickly.
- The fruits of 'NMK-1' selection can be harvested at a time or 2 to 3 time within the period of 20-25 days as per the market convenience.
- Transportation losses in NMK-1 are very less.

Problems Addressed & Solved:

Problems Addressed:

- Low yield of quality Custard Apple in light to medium soils in drought prone area with the available cultivars.
- Low market rates, due to arrival of fruits in the market during glut (October-November).
- Un-availability of the cultivars with the characteristics of prolonged maturity period (un-ripped, un-ruptured, remain on tree till its harvesting).
- Un-availability of the cultivars with the characteristics of adjustable harvesting period.
- Low yield of Custard Apple due to post harvest losses.

- Un-easiness in eating of Custard Apple due to more number of seed, also pulp is sticky & less quantity.

Problems Solved:

1. Identified selection i.e. Annona-2 which yields up to 18 ton's / ha with good quality fruits leads to good market rates, another selection i.e. NMK-1 is also giving the yields up to of 15 ton's/ha.
2. The problem of lower market prices due to arrival of fruits in glut i.e. in the month of September, October can be solved with the introduction of Annona-2 & NMK-1 because of its nature of prolonged maturity period of 5 to 7 month which is normally 4 to 5 month. Generally the Custard Apple produce comes to the market in the month of September-October contributes 98% of total production. So that naturally the market price goes down. Here the Annona-2 & NMK-1 selection play an important role & the fruits fetches good price in the month of November-December or even in the month of January also because of its late maturity characteristics.
3. The problem of un-availability of the cultivars with the characteristics of remaining matured fruits in good condition has been solved with introduction of 'Annona-2' & 'NMK-1' matured fruits has the characteristics to remain in good condition i.e. un-ripped, un-ruptured, on the tree till the harvesting.

The problem of unavailability of cultivars with the characteristics of adjustable harvesting time also been solved because of the introduction of Annona-2 & NMK-1.

Generally the recommended & other varieties of Custard Apple matured in 4 to 5 month and after maturity the fruits get ripped within 4 to 5 days whether it is harvested or not, and if it is delayed in harvesting it get lost. So we cannot adjust the harvesting time, but in case of Annona-2 & NMK-1 if there is problem of low market are or any problem in transportation or cargo facilities farmer can delay the harvesting of this variety with the minimum losses.

The above said selection were also solves the problem of post harvest losses which is very severe in existing cultivars. The Annona-2 & NMK-1 fruits not ruptured even after ripening and hence proved better for transport also.

4. Custard Apple fruit is somewhat drudgery some in eating & hence their problem in its adaptability. The selection 'Annona-2' is having very few numbers of seeds even the average weight fruit is 700 to 800 gms. It means the pulp percentage is more i.e. 70 to 75% and seeds in the fruits were free from pulp. The pulp is not sticked to seed. When we shake the matured fruit we can listen the sound of seeds. So the pulp of ripped fruit can be eaten with the help of spoon. It is a very unique characteristic of that variety. So if this made available on large scale then no doubt it will be liked by the customers from the softness of pulp, style & easiness in eating point of view.

3) The relative advantages of the technology in terms of

i) Cost benefit / Profitability:

In the agricultural sector any technology / innovation has to prove its cost effectiveness, then & then people shows their interest in acceptance. Here the cost benefit / profitability were counted on the basis of its average yield, quality production, market rates & income received from it. Here the comparison made between the Balanagari variety with Annona-2 & NMK-1.

Table No. 1: Comparison of developed selections with existing cultivars in terms of production, quality and income

Variety	Avg. Productivity (tonn/ha.)	Parameters						Avg. income in lac/ha
		Quality Production (%)			Market Rates / kg (in Rs.)			
		Q1	Q2	Q3	Q1	Q2	Q3	
Balanagari	10 to 12	10 to 15	40 to 50	25 to 35	30	15	5 to 10	1.25
NMK-1	13 to 15	90 to 95	1 to 2	1 to 2	80 to 90	60 to 70	30 to 40	7 to 8
Annona-2	16 to 19	70 to 80	5 to 10	5 to 10	70 to 80	40 to 50	25 to 30	6 to 8

From the above table No.1 it is clear that the yield, quality and income per unit of evolved selection are quite superior than existing one.

ii) Labour & Time Saving:

The labour requirement for harvesting is 50% less in Annona-2 & 75% less in NMK-1 as compare to Balanagari variety due to the long harvesting period.

iii) Drudgery reduction:

As all of us know that the eating Custard Apple fruit is somewhat uneasy due to the nature of pulp, no. of seeds & size of berry. This is found very easy in the Annona-2 selection because of soft pulp, more amount of pulp percentage, less number of seed, non sticky pulp to seed. This Annona-2 fruit can be eaten like an ice cream with spoon.

iv) Adaptability across the system:

The adaptability of the Annona-2 & NMK-1 can be judged from the following points.

- MPKV, Rahuri has made memorandum of understanding with Maharashtra Custard Apple Producers Training & Research Board, Pune for work done by Mr. Navanath M. Kaspate in February, 2010 for giving adhoc recommendation.
- He has started Madhubhan nursery for supply of good quality saplings. Till date he has sold lakhs of seedlings to more than 7000 farmers since from 2005. In it almost all the district of Maharashtra has been covered with the cultivation of Annona-2, NMK-1, NMK-2 & NMK-3 etc. Not only Maharashtra, farmers from state of M.P., Karnataka, Gujarat, A.P. & U.P. has cultivated the above said varieties & earning lakhs of rupees.
- The Krishi Vigyan Kendra, Solapur gave technical & moral support to Mr. N.M. Kaspate for development of said selection and gave wider publicity of Mr. Kaspate's work during extension activities and took his intervention while planning the activities for farmers.
- The in charge of Custard Apple Research Station, Ambejogai had frequently visited to the Madhubhan farm & Nursery & appreciated the above said qualities of fruits & the efforts of Mr. N.M. Kaspate. Also this research station has purchased the seedlings for their references.
- Fruit Research Station, Himayatbagh, Aurangabad (MS) has also purchased seedlings of various varieties from the Madhubhan Nursery, Gormale, Tal: Barshi, Dist: Solapur (MS).
- Besides research station & individual farmers various Sugarcane factories, farmers organizations has showed their keen interest in Custard Apple farming & purchased the seedlings.
- Mr. N.M. Kaspate is the Chairman of Custard Apple Producers Training & Research Board, Pune. He & his all board members continuously passing on the message of Custard Apple cultivation with the help of Krushibhushan Mr. V.G. Raul, Barshi, Dist: Solapur Mr. N.M. Kaspate established the board of all Custard Apple producers for training & research. During the conference at Nanded he tried for funds of Rs. 8 crore from Hon'ble Union Minister of Agriculture, Govt. of India, Mr. Sharadchandraji Pawar for the research center on Custard Apple.

4) Photographs:



KVK, Solapur Chief Scientist & SDAO, Solapur interacting with Mr. N.M. Kaspate at his Custard Apple Orchard.



Innovative farmer & Krushinistha Award Winner Mr. N.M. Kaspate, with his innovation Custard Apple 'Annona-2' selection at his farm.



Mr. N.M. Kaspate receiving 'Late Vasantrao Naik Agril. Produce Exporter' award from then Chief Minister of Maharashtra (2004) .



Mr. Vilasraoji Deshmukh, Ex-Chief Minister of Maharashtra observing the Custard Apple's produced by Mr. N.M. Kaspate during exhibition.



The Innovative Farmer Mr. N.M. Kaspate, President, Maharashtra Custard Apple Growers Training & Research Board, Pune from Solapur district.



The "NMK-1 Selection" of Custard Apple developed by Mr. N.M. Kaspate, the special characteristics of this selection is big size berries, we can see in the picture.

5) Outcome:

The Solapur district is coming up as a fruit basket of Maharashtra specially in fruit like Pomegranate, Ber, Grape, Custard Apple, K.lime & Mango. With the cultivation & new innovation in the varieties of Custard Apple the farmers of Solapur district has got the new way in fruit production & to earn more. Besides Solapur district, farmers from other districts of Maharashtra & parts of MP, Karnataka, Gujarat, AP & UP has using the new selections i.e. Annona-2 & NMK-1 and earning lakhs of rupees. These farmers were spreading the message to other farmers also. The area under Custard Apple is increasing speedily in Solapur as well as adjoining districts. The area under Custard Apple in Solapur district is 791 ha due to continuous efforts of Hon'ble Mr. N.M. Kaspate & Extension agencies.

6) Any other Information :

Mr. N.M. Kaspate has established a social organization Madhuban Vikas Pratishthan at Gormale, Tal: Barshi, Dist: Solapur. The main objective of this organization is to provide a dias for innovative farmers. He has also started the website to popularize the potential of Custard Apple crop & to encourage farmers for its cultivation. As earlier mentioned he has curiosity of innovative things, he also trying for the introduction of Date palms crop for commercial cultivation. He has maintained the varieties from other states in his madhuban nursery and also prepared the seedlings & sold to the farmers of Barshi tahsil. Currently the 1.4 ha. area is under Date palm crop.

7) The details of the farmers / rural youth or the local firm / organization who have designed the technology / methodology:

Name of the Farmers	:	Mr. Navanath Mallhari Kaspate
Address	:	A/P: Gormale, Tal: Barshi Dist: Solapur, Pin: 413 404.
Mobile No.	:	9822669727
E-mail	:	nmkaspate@yahoo.com
Website	:	Custardapplekaspatefarm.com
Awards	:	1. Krushi-nishtha Award 1994 (ZP, Solapur) 2. Grape Exporter 1997-98 (Mahagrape, Pune) 3. Late Vasantnao Naik Agriculture Produce Export Award-2004.
Designations	:	Chairman, MCAPT & R Board, Pune Director, MSGP Board, Pune Director, Solapur Grape Growers Association, Nannaj