TRENDS IN AGRICULTURE SCIENCE
Popular Article
Vol.2 Issue 10 October 2023, Page: 818-820

Hand Pollination: A Key for Improving the Fruit Yield of Custard Apple *cv.* Arka Sahan

Anil Khinchi[1] and R.A Kaushik[2*]
[1]M.Sc. Research Scholar, Department of Horticulture, Rajasthan College of Agriculture, Maharana Pratap University of Agriculture and Technology, Udaipur (Rajasthan)
[2]Director of Extension Education and Professor, Maharana Pratap University of Agriculture and Technology, Udaipur (Rajasthan)
https://doi.org/10.5281/zenodo.10055408

Introduction

Custard apple (*Annona squamosa* L.) belongs to the family Annonaceae, originated in tropical America and it is a small shrub of the genus *Annona.* It is commonly known as sweet apple or soursop. Custard apple is an aggregate fruit that grows from a single flower with numerous pistils, each with one carpel. Each pistil gives rise to a fruitlet. The fruitlets are referred to collectively as an aggregate or an etaerio. Custard apple seedlings can be observed growing wild in India. It is a cross pollinated crop, a wide variation in fruit shapes, sizes as well as pulp colour are available. A large number of local varieties are available in custard apple. In several areas of the growing zone, seedling progeny observed growing in the wild. The Arka Sahan, Balanagar, Mammoth, British Guinea, African Pride, Washington P1-98797, APK-1, Barbados seedling, Israeli Selection, Brandy, Islander, Red Sitaphal, are the varieties of custard apple. Among all the varieties, out of these Arka Sahan and Balanagar are having major share in commercial farming.

Figure 1. Custard apple variety "Arka Sahan", developed from IIHR, Bangalore

The variety of Arka Sahan is a very famous interspecific hybrid that evolved by cross between Island gem (*Annona Atemoya* Hort.) x Mammoth (*Annona squamosa* L.). It is very famous variety and

Official Website: trendsinagriculturescience.com
Email Address: trendsinagriculturescience@gmail.com
Published: 30 Oct 2023

the pulp quality is very fine and pure and sweet and the fruits come to harvest in October-November, and mature fruits take about 6-7 days to ripen. The skin is a light green colour with large, flat eyes. The fruit pulp is creamy, pleasant fragrance and good for health. The leaves are used to treat several diseases, ulcers, and grain pests and have therapeutic value, while the root is a powerful purgative. Both seed oil and seed extract have insecticidal qualities. Arka Sahan fruit demand is very high, as it gets higher price than other varieties because of its excellent quality and flavour and fulfils all of the requirements besides this superior quality, the fruit production and quality could be affected by various factors. However, Pollination is a major drawback of this fruit due to self incompability. Hence, hand pollination is required to get optimum yield.

Why Hand Pollination Is Necessary in Arka Sahan

Hand pollination, also known as mechanical pollination, can be utilized to fertilize plants because natural or open pollination is simply undesired or not sufficient. The pollen from male flowers is transferred by hand pollination to the stigma of female flowers. In Arka Sahan variety, the major problem is observed that the flower is not fertilized due to self-incompatibility and poor pollination, so it shows poor fruit set, less yield, smaller sized fruits, and fruits of worst quality, Hence, hand pollination is an effective practice that not only promotes a healthy fruit set but also produces big size, attractive uniform shaped fruits that retain their culinary attributes. It intensely enhance the fruit yield. Fruits developing from hand pollination generally attract premium price in the market.

METHOD OF HAND POLLINATION

The pollen grains are collected, day before the opening of flowers from the variety of custard apple like Balanagar, APK-Ca 1, Raydurg, etc. These varieties serve as a donor for Arka Sahan. The procedure is followed as:

Fig 2: Collection of pollens from "Balanagar" variety

Fig 3: Hand pollination in "Arka Sahan

Official Website: trendsinagriculturescience.com
Email Address: trendsinagriculturescience@gmail.com
Published: 30 Oct 2023

1. First, shaking the flowers while they are turned upside down, pollen is collected in a paper cup.
2. After collecting adequate pollen grains, the cup is tightly inserted inside the worker's shirt pocket to make it simple to release the pollen and easily pollinate the stigma of female flower in Arka Sahan with the help of paint brush No. 2.

Advantages Of Hand Pollination

- It is easy and quick method that helps to improve the fruit set, fruit retention, uniform shape and size and yields with no loss of quality characters of custard apple.
- This also help to cross two different species to develop a new variety of a particular kind of plant.
- It is used for developing distinct colors, disease resistance or other genetic characteristics in a new variety.
- Hand pollination helps to improve the fruit set from 57% to 78%.
- Hand pollination helps to increases the yield and improved the fruit quality as compared to natural pollination.
- Hand pollination can dramatically enhance the fruit production and generate good income to farmers.

Conclusion

Natural pollination can also fail or be insufficient, which can lead to lower yields and poorer quality. Hence, Hand pollination is essential for agricultural production. This means alternative solutions are needed. Hand pollination is a practice in which pollen is applied manually or mechanically to the flower and it is an effective practice that not only promotes a fruit set and also produces attractive shape, uniform size and retain their culinary quality. It is enhancing the fruit yield and hand-pollinated fruits typically attract a premium price in the market.

References

Campbell and Phillips. 1994. *Indian Institute of Horticultural Research- ICAR*, Hassaraghatta, Bengaluru, Karnataka.

Jalikop, S.H. and Kumar, R. 2007. Pseudo xenic effect of allied *Annona* spp. pollen in hand pollination of *cv.* 'Arka Sahan' [(*A*-cherimola x *A-squamosa*) x *A-squamosa*]. *Journal of Horticultural Sciences,* **42**: 1534-1538.

Pareek, OP. and Sharma, S. 1993. Underutilized fruits. *Indian Journal of Horticulture*,

Official Website: trendsinagriculturescience.com
Email Address: trendsinagriculturescience@gmail.com
Published: 30 Oct 2023