AgriCos e-Newsletter
ISSN: 2582-7049
Volume: 02 Issue: 03 March 2021 Article No: 31

Phenology of Dragon Fruit (*Hylocereus* spp.)

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SUMMARY

Pitaya is well known to World for its fruits and beautiful night blooming flowers. Because of beautiful appearance of flowers, it is used as ornamental cacti in some regions of Europe as well as Asia. Its nocturnal showy white flowers which can be used in moon garden. The areoles on the old shoots may be induced to flower after the March equinox naturally, and the floral bud formation occurs in two to three waves from start of May. It has four to seven blooming cycles over an 8 months period. This article discuss about phenology of dragon fruit in brief.

INTRODUCTION

Dragon fruit commonly known as Pitaya is a horticultural crop. This drought-tolerant, tropical fruit crop originated in Mexico, (Bellec, *et al.,* 2006). Now a days it is widely cultivated throughout the globe because of multiple benefits and higher economical value. Presently Pitaya is cultivated in 20 countries for its fruit (Nobel and Barrera, 2004), which is widely available in European fresh fruit markets (Weiss, *et al.,* 1995). Vietnam and Israel share the market and Guatemala gets a few extra batches (Bellec, *et al.,* 2006). Dragon fruit can be grown in wide range of soil types (Karunakaran, *et. al.,* 2019). Its cultivation is possible even under marginal degraded land because of its low water requirement and epiphytic or xerophytic nature (Babar, *et. al.,* 2021). Soil pH ranges from 5.5 to 7.0 is well suited for the propagation and planting. Soil with higher water holding capacity is hazardous for the growth of crop as it leads to rotting of collar region (Jadhav *et. al.,* 2021). Dragon fruit is normally fast growing but nursery stage it can be grow slow as compare to vegetative and productive stage. It can be grown in tropical and subtropical climates. It is frost and chilling sensitive but tolerant of windy conditions and is largely produced in areas where temperatures less than 38 ^{0}C during flowering and fruiting. Optimum temperatures for growth are 18-30 ^{0}C, with good relative humidity. Semi-shaded condition and large canopies most suitable for these crops, it may be injured by extreme sunlight up to 40 ^{0}C. It requires low water, which is related to its crassulacean acid metabolism (CAM) mode of photosynthesis, it means uptake of CO_2 during the night when the stomata are open, which restricts water loss through transpiration during the day time. The all species of dragon fruit are not clearly identified to the researchers.

Botany:

Hylocereus spp. are diploid in nature having chromosome number 2n = 22 (Lichtenzveig, *et al.,* 2000). It is climbing vine plants having aerial roots that bear a glabrous berry with large scales. The dicotyledonous family comprises between 120 and 200 genera consisting of between 1500 and 2000 species found especially in the hot tropical, semi-desert regions of Latin America. Cactaceae family is mainly appreciated for their ornamental qualities, but they also include nearly 250 cultivated species of fruit-bearing and industrial crops.

Species:

Few species are of important such as *Hylocereus undatus*, *Hylocereus polyrhizus*, *Hylocereus costaricencis* and *Hylocereus (Selenicerus) megalanthus* (Jadhav *et. al.,* 2021).

Flowers:

Flowering starts from April to November and extending until December. It arises in four to six flushes, and often in seven flushes. It is a long day plant. Flowers are normally open from 6.30 pm and are closed on the same day at 10.00 pm. However, if they are not pollinated, they remain open until 12.00 noon the next day. The stigma is placed upright during flower opening and the receptive phase, while it turns downward after pollination. Synchronous observation of flowering among individuals can increase cross-pollination possibilities. The flowers

of the dragon fruit are 25-30 cm long, 15-17 cm wide, fragrant, nocturnal and hermaphrodite in nature; however, some cultivars are self-compatible (Badma *et. al.*, 2018).

Hylocereus undatus

Hylocereus polyrhizus

Hylocereus costaricencis

Hylocereus (Selenicerus) megalanthus

Flowers:

Fruits:

The dragon fruits are non-climacteric in nature and sensitive to chilling injury (Zee, *et. al.*, 2004). The fruit is a fleshy berry, oblong and up to 11 cm thick with scales of red or yellow peel. The fruit are with or without spines. Wide bracteoles are red or yellow and covered with several tiny black seeds embedded in white or pink flesh. (Jonathan and Carlos, 2005). Average fruit weight is 150-600 g (Mahorkar and Bahiram, 2019). Approximately 28 days after the flower closes, fruit can be harvested. The fruit must be completely expanded and have 85% pink colour in the skin. Fruit can be left on the stem from 10 to 15 days at this stage (Luders and McMahon, 2006).

Stages of Flower to Fruit Development

CONCLUSION

Phenology is the key aspect of each and every crop study. Yield of crop is always predicted by its phenological status and performance. Flowering of dragon fruit is very sensitive to rains, as the occurrence of rain during fruit development leads production of malformed fruits which are mostly undersized and of inferior quality. Such fruits are not expected in market. This sensitivity creates a great challenge to agriculture researchers. As dragon fruit is very much new crop to the world, frequent and well planned studies are needed to be done on this aspect for higher and better yield.

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