Production Technology of Hyacinth (Hyacinthus orientalis)

Krishna Kaushik[1]*

[1]Department of Horticulture, SHUATS, Prayagraj

Corresponding Author : koushikkrishnaram@gmail.com

Introduction

Hyacinthus orientalis L., the common hyacinth, garden hyacinth or Dutch hyacinth, is a species of flowering plant in the Family Asparagaceae/Hyacinthaceae, Sub family Scilloidiae, the genus is native to the eastern Mediterranean region (From the north of Bulgaria, southwestern Syria, Lebanon and northern Palestine). Ornamental flower bulbs exhibit great diversity in their growth, development biology, morphology and physiology response to environmental factors (Benschop *et al*. 2010). It was introduced to Europe in the 16th century. After a long period the Dutch, or common hyacinth of house and garden culture (*H. orientalis*, native to southwest Asia) was so popular in the 18th century that over 2,000 cultivars were grown in the Netherlands, its chief commercial producer. This hyacinth has a single dense spike of fragrant flowers in shades of red, blue, white, orange, pink, violet or yellow. A form of the common hyacinth is the less hardy and smaller blue- or white-petalled Roman hyacinth of florists. These flowers need indirect sunlight and should be watered moderately. It is widely cultivated everywhere in the temperate world for its strongly fragrant flowers which appear exceptionally early in the season, and frequently forced to flower at Christmas time. They are mainly grown for aesthetic purpose in gardens and as cut flower. They are also used industries related to perfumery for obtaining essential oil extracts and also used as indoor or outdoor plants.

Varieties

Hyacinth flowers have rich history that are as colorful as their blooms. They also have numerous health benefits but use them with proper precautions. So many varieties are their but in India few are grown widely.

Blue Jacket

With dense spikes of deep blue flowers and a dark purple stripe on every petal, Blue Jacket grows up to ten inches tall and will naturalize in the right spot. It is resistant to deep and rabbits and is very easy to grow.

Gipsy Queen

These cheerful flowers include petals in soft coral with bright green, lance- shape leaves. It, too, has a lovely aroma, and is resistant to both deer and rabbits. It will naturalize in the right spot, and grows up to ten inches in height.

Hollyhock

The award-Winning Hollyhock has double flower in a reddish-pink color and a sweet, very noticeable and pleasant aroma. It

grows best in well-drained spots with medium moisture, and has won several international flower awards.

Jan Bos

With starry, dark pink flower blooms for several weeks in mid-spring and has a very pleasing aroma.

Miss Saigon

The winner of several international flower awards, this type of hyacinth is highly fragrant and has star-shaped, violet petals and bright green leaves. Miss Saigon does best in full or part shade, and blooms for several weeks in the spring.

Woodstock

Blooming for several weeks in mid-spring, this flower has reddish-purple petals and bright green leaves. Their dark plum color makes them truly unique, and because they also are very fragrant, they do well when planted along pathways and near patios and decks.

Fondant

With the lovely single, sugary-pink flowers. It is an excellent variety for forcing in pots for early color and fragrance indoors, but are equally valuable as an outdoor plant for flowering in late spring.

Top White

With a sweet and rich fragrance, Top White has bright green leaves and snow-white petals, and prefers full to partial shade. As with other types of Hyacinths, Top White is perfect for planting along walkways or near patios and decks, and it will grow up to ten inches in height.

Ecological requirements

Soil

Hyacinth can be grown in loosened, moderately fertile soil that drains well. Avoid low area where water collects; hyacinths will rot in wet soil. Before planting, loosen the soil and work in 2 to 4 inches of compost or bone meal for fertility.

Climatic conditions

Most of the hyacinths grow in zone 3 to 9. They must have cold temperatures 40 to 45º (4 to 7º) for at least 12 to 14 weeks. If temperatures in your area do not get this cold, you will need to pre-chill the bulbs in a refrigerator before planting them outdoors.

Propagation

Hyacinths are commonly propagated by vegetative means through bulb. Micro-propagation has also been successful method for large scale multiplication. Propagation through seed is used by the breeder for evolving new varieties.

Seed

Seed are not preferred for commercial multiplication; however they are used for development of new cultivars. Their natural propagation rates are very slow and take 4-6 year to develop a bulb size capable of flowering and seed set under ideal conditions [Suleyman kizil *et al* 2016].

Bulb

Hyacinths are commonly grown by bulbs. Amano and Tsutsui [1980] suggests 43°C and 38°C temperature treatment for 4 and 30 day to induce offsets on 15 cm circumference bulblets. Commercial propagation of the plant is done by scoping or cross cutting by removing apical meristems on the cut surfaces or leaf cuttings and scales [Hartmann *et al*. 1990].

Micro propagation

Plant tissue culture studies use leaves, scales, inflorescence stalk, ovaries and perianths [Hussey 1975, Pua and Chong 1984, Lu *et al.* 1988] to achieve the objectives. The breeding and commercial method of propagation should be easy independent and efficient for propagation of plants year long.

Production technology

Selection of bulb

To obtain hyacinth flowers of good quality, it is important to use the right bulb size. Bulb sizes (the circumference of the bulb in centimetres) 15-20 will provide the best results.

Dormancy of bulb

Bulb do not sprout if sown immediately after harvest even under favorable growing conditions for a minimum of 45-60 days due to the rest period of the bulbs. The dormancy can be broken by storing the bulbs in the cold storage or shady area for 8 to 12 weeks with the temperature of 2-4°C (35-45°C).

Planting time and density

In the north Indian plains, Hyacinth is planted during winter in the month of November-December [Krishna kaushik *et al*. 2021]. It can be planted in flat beds, raised beds and also in pots. In light soils such as sandy and sandy loam. It is advisable to plant them in 1m wide raised beds to excess water drained out.

Planting density

Planting of Hyacinth bulbs is done for to purpose cut flower and bulb production. Above 16-17cm circumference of hyacinth bulb should be plant at a spacing of 40×40cm row to row and bulb to bulb.

Depth of planning

The depth of planting of bulbs in soil mainly depend upon the size of bulb, type of soil and time of planning. Normally, bulbs should be done in 3-5cm depth.

Nutritional requirement

Heavy fertilization has retarding influencing on root growth and flowering. After the three weeks of planting of bulbs, Calcium Ammonium Nitrate (CAN) @ 1 kg/100m^2 should be applied. When the plants are in active vegetative growth, the second dose of CAN should be applied @ 1kg/100m^2.

Irrigation

Drip irrigation system is suitable for hyacinth. Watering of the field should be done a few days prior to planting, in such a way, that the bulbs can be planted when the soil is moist but not excessively wet. Because of hyacinth bulbs are highly sensitive to water logging condition. In condition of excess water bulbs are start wilting. So that bulbs cannot be sown in deep area and water logged area.

Diseases and pest and their management

Diseases

The production of hyacinths for cut flowers usually runs smoothly. Many problems can be prevented by the proper choice of material and the proper treatment of the bulbs before and during production. This diagram shows the most important diseases and how to deal with them. Using preventive measures reduces the risk of major damage.

Bulb rot

In this plant displaying poor and uneven rooting. This disease always begins due to excessively moist conditions during storage and is frequently associated with mechanical injury or damage of mites. Infected bulbs have a dry, punky rot and the bulb scales are often covered with the characteristic blue-green (Penicillium) or pink (Fusarium) colored growth of the fungus.

Control

Do not damage the bulbs, and be sure to plant them immediately upon arrival. Store bulbs under the ventilated and dry conditions. Control is achieved through careful digging to avoid wounding.

Soft rot

It is a bacterial disease. Infected plants fail to flower or blossoms fall off before they open. Top may appear water-soaked and collapse. Infected bulbs have a strong odor and are soft and mushy. Wet, dark green spot on leaves and flower stem that start at the base of the bulbs and extend upward. The plants have an unpleasant odour.

Control

Bulbs do not panted under wet, warm conditions. All infected bulbs should be discarded.

Bulb fly

***Merodon equestris*. Pest:**

The maggot of this fly infests the bulbs and ruins them.

Control

Destroy all infested bulbs after digging. Three hours of hot-water treatment at 110º F will be helpful in control. Small, stunted and otherwise obviously infested plants may be dug up and burned, thus preventing the spread of the infestation.

Bulb mite : *Rhizoglyphus echinopus.*

This mite injures bulbs. The mites breed continuously in greenhouses or wherever the temperature and moisture are sufficiently high. It is possible for 10 or more generations to mature in a year.

Control

Burn all soft and decayed bulbs, if allowed; store bulbs at about 35º F. Heat treat bulbs before storage (see also bulb fly, above).

Harvesting and Storage

Hyacinths produced for cutting are harvested by pulling the plants, bulb and all, from the soil. The hyacinths are ready to harvest when the flower cluster is showing definite colour and at least one of the bells has separated from the cluster. The next step is to cut the plant out of the bulb and leave the base of the bulb attached. With the base of the bulb still attached, the plant develops better flowers. This also improves keeping quality. There are

several kinds of bulb removing machines that can be used to more or less mechanisze this process. In the Netherlands, hyacinths used as cut flowers are bunched five to a bunch and held together with tape or rubber bands. Before packaging, it would be advisable to rinse off any soil residue with clean water. The bunches can then be placed either dry or in a container with a few millimeters of water for up to three days in a refrigerated storage maintained at around 2 to 5°C. Hyacinths with bulbs attached can also be placed in refrigerated storage in an upright position (to prevent crooked growth). Consumers should also be advised not to trim the stems from these hyacinths but to leave the base of the bulb attached.

Conclusion

Hyacinth has wide color ranges of flowers and also high fragrance. It is popular in International flower market or in European counties and has a high value. So that, If farmers grown hyacinth plant with better management practices then they should get high profit from it.

Reference

- Amano, M., Tsutsui, K. (1980). Propagation of hyacinth by hot temperature treatment. *Acta Hortic.*, 279–287.
- Benschop, M., Kamenetsky, R., Le Nard, M., Okubo, H., De Hertogh, A. (2010). **The Global Flower Bulb Industry: Production, Utilization, Research**. Horticultural Reviews, Vol. 36 Edited by Jules Janick, Wiley-Blackwell.
- Hartmann, H.T., Kester, D.E., Davies, F.T., Geneve, R.L. (1990). Plant propagation: principles and practices. *Prentice Hall, Englewood Cliffs, NJ.*
- Hussey, G. (1975). Propagation of hyacinths by tissue culture. *Sci. Hort*., 3, 21–28.
- Kizil, S., Sesiz, U., Khawar, K.M. (2016). Improved in vitro propagation of Hyacinthus orientalis L. using fruits containing immature zygotic embryos and tender leaf sheath as explants. *Acta Sci. Pol. Hortorum Cultus,* 15(5), 15–30.
- Kaushik Krishna, Topno E. Samir, Vijay Bahadur, Prashad Vipin M., 2021 Leaf chlorophyll, nitrogen concentration, plant growth, flower yield and quality of hyacinth (H. orientalis). *Green farming* Vol. 12 (1&2): Jan- Feb. & March-April 2021.
- Lu, W., Enomoto, K., Fukunaga, Y., Kuo, C. (1988). Regeneration of tepals, stamens and ovules in explants from perianth of Hyacinthus orientalis L. importance of explant age and exogenous hormones. *Planta*, 175, 478–484.
- Pua, E.C., Chong, C. (1984). Requirement for sorbitol (D-glucitol) as carbon source for in vitro propagation of Malus robusta No. 5. *Can. J. Bot.,* 62, 1545–1549.

❖❖