

ORNITHOGALUMS

an impressive bulbous ornamental

1. Devarai Lava Kumar

Division of Floriculture and Landscaping, ICAR-IARI, New Delhi

2. M. K. Singh

Division of Floriculture and Landscaping, ICAR-IARI, New Delhi

3. Ritu Jain

Division of Floriculture and Landscaping, ICAR-IARI, New Delhi

4. Babita Singh

Division of Floriculture and Landscaping, ICAR-IARI, New Delhi

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Ornithogalum are the perennial bulbous geophytes belongs to the family Asparagaceae. The genus *Ornithogalum* is commonly referred as **chincerinchee** or **star-of-Bethlehem**, based on its attractive star-shaped flowers and other names like Sun Star, Cape Hyacinth, Spire Lily and Summer Hyacinth. The botanical name of the genus is derived from a combination of two Greek words '*ornithos*' meaning 'bird' and '*gala*' meaning 'milk'. This name is believed to refer to the white color of its flowers. These are native

to Eurasia and Africa and includes various 100 species of bulbous herbs. Among them the species, *Ornithogalum thyrsoides*, *O. umbellatum* and *O. arabicum* are the common garden *ornamentals*. It is used to symbolize attributes like innocence, purity, integrity, optimism, and absolution. The very name of this flower conveys its significance during the holiday season as, this flower starts its availability from the time of Christmas.



Star shaped flowers of *Ornithogalum*

Botany

Star-of-Bethlehem is a winter monocotyledonous bulbous crop, belongs to Asparagaceae family. *Ornithogalum* species vary in size and growth habit. Some are low-growing and suitable for ground cover, while others are taller and more upright. It consists of the narrow or straplike leaves, that are grouped at the base of the plant and emerge from the underground bulb. The shades of yellow, orange, or green bell or star-shaped flowers are borne in clusters at the top of a leafless stalk. Each flower is borne on a short stem, with a bract (leaflike structure) below

it. The plant blooms on a 10-inch long, multi-flowered spike and each spike bears about 12 to 30 star-like blooms with six petals each. The backside of the petals sport a broad band of green. These flowers open in the morning and close every evening. Some species can spread aggressively by bulbils and readily naturalize. Fruits are 3 angled capsules that are obovate or oblong having black and shiny seeds. Seeds are usually globose with a prominently reticulate (net like pattern) testa having firm endosperm.

Ornamental species diversity

The genus *Ornithogalum* encompasses a wide range of species, and the characteristics of individual species can vary considerably. Some popular species include

- ***Ornithogalum umbellatum***: It is popular as common star-of-Bethlehem, the garden star-of-Bethlehem, grass lily, nap-at-noon or eleven-o'clock lady. It is a relatively short plant, occurring in tufts of basal linear leaves, producing conspicuous white flowers, in a stellate pattern, in mid to late spring. The flowers open late in the day.

- ***Ornithogalum thyrsoides***: commonly referred as chinkerinchee or chincerinchee, star-of-Bethlehem or wonder-flower. It yields enduring flowers highly valued for use as cut flowers.
- ***Ornithogalum arabicum***: It is native to northern Africa and southern Europe. Common names include Arab's eye, lesser cape-lily and Arabian starflower.



Ornithogalum umbellatum



Ornithogalum thyrsoides



Ornithogalum arabicum

Inflorescences of various ornamental species of *Ornithogalum*

Ornamental Uses

Ornithogalums can fit as good winter bulbous ornamental in the gardens.

These have several ornamental uses in horticulture and landscaping:

Garden Plants: Many *Ornithogalum* species are cultivated as garden plants for their attractive star-shaped flowers. They can be grown in flower beds, borders, or rock gardens, tubs and in ornamental urns to add visual interest and colour.

Container Plants: Some smaller *Ornithogalum* varieties are well-suited for container gardening. They make lovely additions to pots, window boxes, or hanging baskets.

Indoor Plants: Certain *Ornithogalum* species, like *Ornithogalum arabicum*, are grown as indoor houseplants. They thrive in containers and can be brought indoors to enjoy their blooms.

Cut Flowers: *Ornithogalum* flowers are prized for their longevity with long stem which make them ideal for cut flowers in floral arrangements, like flower bouquets, button holes, in vases and

in table decoration Their star-like appearance adds an elegant touch to bouquets and centre pieces.

Naturalizing: Some species, such as *Ornithogalum umbellatum*, are used for naturalizing in grasses, meadows, shrubby borders, woodland margins, and other wild areas where they do not become a problem. They can create a beautiful carpet of flowers when allowed to spread.

Forcing: *Ornithogalum* bulbs can be forced to bloom indoors, making them popular choices for winter and early spring floral displays.

Overall, *Ornithogalum*s offer versatility in landscaping and floral arrangements, making them valuable additions to gardens and floral design.



Boarders



In pots



Flower beds



In Vases



Flower bouquet



Button hole

Various ornamental uses of *Ornithogalum*s

Cultivation aspects

Soil and Climate: *Ornithogalum* thrives well in loamy or sandy loamy soils that are rich in humus and organic matter. These plants have a preference for moderately moist, well-draining soil blends, and tend to thrive particularly well in soils with a pH range between 5.5 and 6.0.

It grows best with exposure to full to partial sunlight, which promotes robust vegetative growth and abundant flower production. It's essential to ensure adequate air circulation around the plants. In warm regions where early autumn planting is preferred, it's advisable to provide at least 50% shading to encourage taller plant growth. These plants flourish in areas that receive moderate to high rainfall and experience temperatures ranging from 14°C to 24°C. Early flowering in this crop is induced by warm daytime and nighttime temperatures of 27°C and 22°C, respectively, along with extended daylight conditions.

Propagation: As this is a bulbous crop, mostly propagated by the means of bulbs having 3- 4 cm size for production of best vegetative and floral growth as well as the bulbs. These plants can also be propagated by the means of seeds, leaf cuttings and micro propagation also.

Time of planting: The ideal planting time can vary based on geographical location, but the preferred method of production involves dividing offsets or bulbs typically in September or October. The larger bulbs are directly planted in their permanent positions, whereas the smaller bulbs are initially placed in pots or propagation blocks, allowing them to establish themselves for a year. They are then transplanted in late spring or early summer.

Planting Depth and Density: The recommended planting density varies depending on the species and bulb size. For *O. arabicum*, a planting density of 80 bulbs per square meter is advised. For *O. saundersiae*, it is recommended to plant approximately 60 bulbs per square meter. As for *O. thyrsoides*, a planting density of around 110-

80 bulbs per square meter is recommended with a wider spacing of 20 x 30 cm or 20 x 40 cm on the prepared beds at a height of 30 cm. Bulbs should be planted at a depth of 7 to 15 cm.

Fertilization: *Ornithogalum*s are considered light feeders, and excessive feeding can lead to the browning of foliage tips. It is a long season crop and hence requires a good nutrient supply spread over a longer period for better vegetative and bulb growth. Use of fertilizer N:P:K in the ratio of 5:2:4 in a well-drained potting mixture is recommended. Providing a nutrient supply over an extended duration is crucial for enhancing both vegetative and bulb growth. While the demand for phosphorus (P) and potassium (K) isn't particularly high, it's important to ensure adequate potassium levels, especially during the early growth stages, due to the bulbs' naturally low potassium content. When growing *Ornithogalum*s in pots within greenhouse settings, it is recommended to use a complete liquid fertilizer mixture with a formulation of 17-10-27. About 75- 100 ppm nitrogen fertilizer solution is sufficient.

Irrigation: These plants have a moderate water requirement, and they thrive when consistently watered throughout the growing season, which spans from early spring to early summer. It is essential to maintain the planting medium consistently moist during this period for optimal growth and performance.

Plant growth regulators: Soaking of *O. thyrsoides* bulbs in GA @ 150 ppm for 24 hours produced best results in terms of plant growth and longer flowering duration. Spraying of Benzyl adenine @ 100 ppm improved growth, flowering and bulb production.

Diseases and Pests: The plants are mostly free of serious insect and pest problems. Bulb rot and root rot may be a problem in plants where the soil does not have good drainage and gets too soggy. Bacterial soft rot is one of the most destructive diseases affecting *Ornithogalum*. There is no

effective treatment for soft rot, prevention or discarding the plant is the ultimate solution.

Flowering and Yield: Flowers are available from November to January and 12 to 14 stems can be harvested from each plant.

Harvesting and Postharvest Management: Once the first floret is fully colored and open, it is ready for harvesting. These flowers can be stored at a temperature of 2°C for more than a week. Bulbs should be dug up from the soil during their first two growth years. After the blooms have faded, it's advisable to trim off the spent flowers to prevent self-seeding and excessive spreading.

For bulbs storage, they should be in a plump condition and devoid of any mold or signs of disease. These bulbs should be stored in a well-ventilated area and shielded from direct sunlight. Maintaining a moderate relative humidity level, ranging from 30 to 60 percent, is important, as excessive humidity can encourage issues like bacterial soft rot (*Erwinia carotovora*) and blue mold. At the time of harvest, the shoot apex of the bulb is in a vegetative state, and bulbs should be stored dry at 28-30°C for 6 weeks for rapid inflorescence development.

