



CONTROL OF SOME ENVIRONMENTAL CONDITIONS AND THEIR EFFECTS ON THE *NARCISSUS* SPP.: A SUBJECT REVIEW

Kareema Abed I. AL-Fatlawi¹ Mateen Yilmaz I. AL-Bayati² Mohammed Abdulaziz Lateef³

¹ Department of Horticulture, College of Agriculture, University of Baghdad, Iraq

^{2,3} Department of Horticulture, College of Agriculture, University of Kirkuk, Iraq

e-mail: uk_mateen@uokirkuk.edu.iq

Article history:	Abstract:
Received: 10 th November 2021 Accepted: 13 th December 2021 Published: 30 ^h January 2022	Narcissus belongs to the Narcissistic family (Amaryllidaceae), and it is a winter annual bulbs, the name of the genus Narcissus is taken from the Greek word Narkêin, which means in the Arabic language it numbs or dilutes, referring to the smell of its flowers, they are <i>N. pseudonarcissus</i> , <i>N. poeticus</i> . Light is one of the main environmental factors that affect the plant, dry mass and yield, and the duration of exposure to light is the main and controlling factor in the flowering process. Al-Tikriti (2020) showed that the treatment of night break for 120 minutes on <i>Dendranthema grandiflora</i> cultivar Rosanna caused significant differences in a number of vegetative growth characteristics such as plant height (east - west) and plant diameter (north - south), as well as in the percentage of dry matter and total chlorophyll. Mulching is one of the simplest and most beneficial practices that can be used in various horticultural applications. It is added by adding a layer of material that is spread over the soil, mulching can be either organic, such as field crop residues such as maize residues, grass clippings, straw, bark chips, fallen leaves and other materials. Similar inorganic such as plastics, stones, and brick chips. Thakur et al. (2019) showed in a study they conducted on <i>Rosa damascena</i> Mill using two types of organic covering (poplar leaves) and industry (black polyethylene), the plant reached (139.1 cm, 24.6 and 146.7 cm), respectively, compared to the control and organic coverage treatment.

Keywords: Narcissus, Day length, Mulching,

INTRODUCTION

The word geophytes refers to all plants that have storage organs for nutrients under the surface of the soil, whether they are bulbs, corms, tubercles, or other storage organs, many of which are considered ornamental plants, as they are used for the purposes of producing cut flowers or as pot plants or for planting in gardens, and the main function of these storage organs is to store food and water and use them during unsuitable environmental conditions, these plants are within one of two climatic cycles: the first cycle climate Warm - cool for temperate zone plants and the second cycle wet - dry climate for plants of tropical and subtropical zones (Hartmann et al., 2002). On this basis, Narcissus is considered one of the members of that group, Narcissus belongs to the Narcissistic family (Amaryllidaceae), and it is a winter annual bulbs, the name of the genus Narcissus is taken from the Greek word Narkêin, which means in the Arabic language it numbs or dilutes, referring to the smell of its flowers, they are *N. pseudonarcissus*, *N. poeticus*, the first type originated in an area extending from Portugal and Spain to England and Sweden, The second type is native to the Mediterranean region, The types of tazetta and tazetta jonquilla were used in the crosses for the production of several varieties, The importance of daffodils is due to the fact that the flowers of some of its varieties are suitable for commercial picking, it is also planted in front of shrubs or evergreen plants or in green spaces (Khatab and Descriptive, 1988). As for its use in landscaping, its cultivation is usually appropriate in natural-style gardens more than engineering, and it is grown in basins and flower circles with a group of herbal flowers, and essential oils are extracted from its flowers on a commercial scale, A number of chemical compounds have been isolated, including Eugenol, Cinnamyl Alcohol, Benzaldehyde and Benzoic Acid (Guenther, 1975). In addition to its medical uses, it was found that it has an effect against some types of cancer because it contains the compound Benzaldehyde, which is converted in the human body into Laetrile-like or Lycorine, which in turn turns into a Lycobetaine-like compound known for its effect in limiting the growth of cancer cells (Morris, 2000). Narcissus flowers have a floral cover, in which the calyx is colored in the color of the petals and grows in appendages perpendicular to the level of the flower cover and unite with each other forming what looks like a cup or crown. It is not easy to separate them when uprooted from the ground, and they are covered with dry scaly leaves that protect them from drying out or rotting during storage (Betushi, 2011). The importance of the narcissus plant comes in its

early flowers, which are suitable for picking, the shape of the beautiful cluster flowers and their pleasant smell, in addition to its use in arrangements (Crop-Sp, 2002). Ornamental plants are often not well adapted for production as potted plants or planted in the soil of greenhouses, and for the production of different plant species it is necessary to use some treatments to control growth and flowering, which include lengthening or shortening the day, controlling temperatures during production stages, pinching, or using programs Feeding or treatment with growth regulators (Whipker et al., 2003).

DAY LENGTH

Light is one of the main environmental factors that affect the plant, dry mass and yield, and the duration of exposure to light is the main and controlling factor in the flowering process (Zoratti et al. 2014). Supplementary lighting is exposing the plant to moderate intensity lighting at night and on cloudy days to increase the quality of plant growth, and high pressure sodium is one of the most common lamps in supplementary lighting, but on the other hand it is preferable to use LED lamps for its economic advantage (Runkle, 2018). When the duration of illumination is short, it is necessary to cut the darkness or extend the length of the day to encourage flowering of long-day plants or prevent flowering in short-day plants (Kwon, 2014). Light plays a major role in improving the characteristics of vegetative and flowering growth, as Kanellos (2000) showed a significant decrease in the height of *Cosmos atrosanguineus*, which reached double under the conditions of the short day compared to the day treatment. Legnani and Mille (2000) also found that the total dry weight of the *Dahlia hybrid* bulbs was not affected by any effect of the photoperiod between 9 and 14 hours, and it was found that the length of day 14 hours is suitable for increasing the percentage of dry weight, number of leaves, length of branches and leaf area compared to plants grown in The length of the day is 9 hours. Al-Alawi (2003) mentioned in a research he conducted on *Dendranthema grandiflorum Kitam*, which plants were treated with two treatments for the length of the day (long day 14 hours of illumination and short day 8 hours of illumination using black polyethylene coverage, starting from the beginning of August and for a period of 3 months from 6 p.m. Until 8 a.m. on the next day, a noticeable increase in plant height appeared when treating with long day and for both seasons, and the plants treated with natural long day significantly outperformed short day plants, as for the second season, the diameter of the stem was not affected by day length, and the treatment of length of day outweighed the treatment of short day, the treatment of the length of the day was superior to the treatment of the short day in both seasons in the characteristics of the number of branches of the plant and the number of leaves. Kazaz et al. (2010) found in an experiment conducted in India on *Dendranthema grandiflorum* using (long day and short day), where significant differences appeared between treatments such as plant height when treated with natural day compared with short day, while the diameter of the stem exceeded when treated with short day compared to Treated with a long day. Runkle et al. (2012) showed that prolonging the day for *Dendranthema grandiflorum* for four hours gave better results than treatment with the long day for a period of six hours in most of the vegetative growth characteristics. Naing et al. (2016) showed in a study on two cultivars of *Rosa hybrida* L., namely Loving Heart and Top Grace, using high pressure sodium lamps (400 watts) for a period of 6 hours and at a distance of 1.5 meters above the plants, which begins immediately after sunset, the characteristic of plant height and it gave (40.1 and 48.2 cm) for the two cultivars, as for the characteristic of plant stem diameter, the cultivar Top Grace significantly outperformed it by giving the largest diameter of the stem when exposed to illumination, which amounted to (4.2) mm. Whereas Kumar and Singh (2017) explained when exposing *Chrysanthemum morifolium* Ramat. Zembra cultivar to the duration of illumination (15) hours / day and gave the highest average plant height 46.25 cm and number of leaves 32.75 compared with the control treatment. Park et al. (2017) when treating *Geranium Pelargonium × hortorum* L.H. with LED lights at two levels (long day consists of 16 hours during the day and 8 hours at night) and (short day consists of 10 hours during the day and 14 hours at night), as the treatment of the short day was superior in the plant height in comparison with the treatment of the long day. Eva (2018) showed in a research conducted on *Lantana camara* L. using three levels of illumination (45.400, 73.400, 101.300) Lux, the research showed significant differences, as 45.400 Lux surpassed it by giving it the highest plant height, number of leaves and leaf area compared to The rest of the lighting levels are high. Al-Tikriti (2020) showed that the treatment of night break for 120 minutes on *Dendranthema grandiflora* cultivar Rosanna caused significant differences in a number of vegetative growth characteristics such as plant height (east - west) and plant diameter (north - south), as well as in the percentage of dry matter and total chlorophyll.

MULCHING

Mulching is one of the simplest and most beneficial practices that can be used in various horticultural applications. It is added by adding a layer of material that is spread over the soil, mulching can be either organic, such as field crop residues such as maize residues, grass clippings, straw, bark chips, fallen leaves and other materials. Similar inorganic such as plastics, stones, and brick chips (Bell et al., 2009). The benefits of mulching in general lie in protecting the soil from erosion, reducing pressure from the effect of heavy rain, maintaining moisture, reducing the need for frequent watering, and maintaining an even temperature of the soil, in addition to preventing the growth of weeds, organic mulching also improves the condition of the soil as it decomposes slowly, it provides organic matter that helps maintain soil aeration which improves root growth and increases water intrusion and also improves the soil's water-holding capacity, organic matter is a source of plant nutrients and provides an ideal environment for earthworms and other beneficial soil organisms, while inorganic mulching does not, it decomposes in the soil and is unable to add

nutrients to the soil in which it is added (Pfeiffer, 2019). Soil mulching is an important process used in landscaping as well as in garden engineering to reduce soil water evaporation and weed competition (Donk et al., 2011). Field crop residues such as maize broom, straw, rice husks, wood chips or plastic covering can be used as an artificial covering in ornamental crops (Stowell, 2000). Donk et al. (2011) conducted to investigate the effect of sawdust thickness (0, 2.5, 5, 10) cm on soil water content, weed germination, and soil temperature in the soil in which Penstemon (Husker Red) was planted, and proved that adding mulching at all levels Conserves soil water when compared to no mulching, bush growth was significantly higher at (0 and 2.5) cm thick as compared to (5 and 10) cm thick, in general, and midday soil temperatures were highest at shallow soil depths, in the uncovered plots, while there were no significant differences in the number of flower stems.plant⁻¹, although there was a tendency for fewer stems than the mulching treatment, these results indicated that sawdust helped conserve soil water, which In turn, it had some effect on plant growth. In a study by Younis et al. (2012) about the types of covering represented by white plastic, black plastic and rice straw on *Freesia* spp. Aurora cultivar, the results showed a decrease in the time required for germination and a significant improvement in the germination rate using black plastic compared to the control treatment, while the treatment of rice straw was superior in plant height 37.11 cm compared to the rest of the experimental factors. While the researcher Muttaleb (2018) found that when covering *Zinnia elegans* with wheat straw and *Miscanthus* (*M. x giganteus*) shredded and un-grated, he found that silver weed was the most suitable because it inhibits the growth of bushes and weeds by depriving them of the required sunlight in Seed germination and growth, and silver weed, untreated, led to an increase in plant growth by increasing the length and diameter of the stem. While Thakur et al. (2019) showed in a study they conducted on *Rosa damascena* Mill using two types of organic covering (poplar leaves) and industry (black polyethylene), the plant reached (139.1 cm, 24.6 and 146.7 cm), respectively, compared to the control and organic coverage treatment.

REFERENCE

1. **Al-Alawi, Rasha Hashem Abdel-Aziz (2003)**. Effect of photoperiod and licorice extract on vegetative and flowering growth characteristics of three cultivars of grandiflorum Kitam *Dendranthema*. Master Thesis, College of Agriculture, University of Baghdad, Ministry of Higher Education and Scientific Research, Republic of Iraq.
2. **Al-Tikriti, Ahmad Nazir Hussain (2020)**. Effect of dark break treatment and spraying with pacloprazol on growth, flowering and coordination value of *Dendranthema grandiflora*, Master Thesis, College of Agriculture, Tikrit University, Ministry of Higher Education and Scientific Research, Republic of Iraq. Bell, N., D.M. Sullivan, and T. Cook. (2009). Mulching Woody Ornamentals with Organic Materials. Oregon State University.
3. **Bitushi, Taher Najm Rasoul (2011)**. Al-Absal Al-Zeina, General Directorate of Scientific Libraries. Erbil. Iraq .
4. **Crop-Specific Guidelines For Growers (2002)**. [http:// www.crop-specific guidelinesfor narcissus.htm](http://www.crop-specific-guidelinesfor narcissus.htm).
5. **Donk , Simon J. van, Dale T. Lindgren , Daniel M. Schaaf , James L. Petersen and David D. Tarkalson (2011)**. Wood chip mulch thickness effects on soil water, soil temperature, weed growth and landscape plant growth. *Journal of Applied Horticulture*, 13(2): 91-95.
6. **Eva, Muthahara (2018)**. THE EFFECT OF LIGHT INTENSITY AND PACLOBUTRAZOL ON FLOWERING OF LANTANA PLANTS (LANTANA CAMARA L.). Master's Program in Agronomy, Faculty of Agriculture, University of Brawijaya, Indonesia. DOI <https://doi.org/10.18551/rjoas>. RJOAS, 8(80).
7. **Guenther, E. (1975)**. The essential oils. vol.v. r.e. kriegler publishing company, huntington, new york. pp. 350.
8. **Hartmann, H.T., D.E. Kester, F.T. Davies And R.L. Genev (2002)**. Plant propagation, principles and practices 7thedition ,prentice hall, upper saddle river, new jersey.
9. **Kanellos , S. P. (2000)**. Environmental regulation of flowering and growth of *Cosmos atosanguineus* (Hook.) Voss. *Scientia Horticulture* .,83: 265-274.
10. **Kazaz, S. Askin, M. A. and Kilic, S. E. N. (2010)** Effects of day length and daminozide on the flowering, some quality parameters and chlorophyll content of *Chrysanthemum morifolium* Ramat. *Scientific Res Essays* 5(21):3281-88.
11. **Khattab, Mahmoud and Imad El Din Wasfi (1988)**. Ornamental bulbs and their diseases, pests and methods of resistance - Knowledge facility in Alexandria - second edition.
12. **Kumar, Sunil and M. C. Singh. (2017)**. Effect of photoperiod on growth characteristics in *Chrysanthemum morifolium* Ramat. cv. Zembra using high pressure sodium light. *Division of Floriculture and Landscape Architecture*. 18 (1) : 110-115.
13. **Kwon, O Hyeon, Won Hee Kim, Su Young Lee, Hye Jin Lee, Kyeong Seong Cheon, and Wan Soon Kim (2014)**. Effect of Supplemental Lighting on Temperature and Humidity in Greenhouse and the Growth of Cut Roses. 22(3):167-171.
14. **Legnani, G. and W.B. Miller (2000)**. Night interruption lighting is beneficial in the production of plug of Dahlia 'Sunny Rose'. *Hort Science*. 35 (7): 1244-1246.
15. **Morris, R. (2000)**. Plant for a future. <http://www.comp.leeds.ac.uk>. n and p2o5 fertilizers. *sarhad j. agric. vol.27, no.2*.

16. **Muttaleb, Anmar. (2018).** The Effect of Three Different Mulches on Weed Presence, Soil Characteristics, and Zinnia Growth. Murray State Theses and Dissertations. 77.
17. **Naing, Aung Htay, Su Min Jeon, Jun Seong Park, and Chang Kil Kim (2016).** Combined effects of supplementary light and CO₂ on rose growth and the production of good quality cut flowers. *Can. J. Plant Sci.* 96: 503–510.
18. **Park, Y. G. Sowbiya, M. Prabhakaran, S. Abinaya, M. and Byoung, R. J. (2017).** Light Quality During Night Interruption Affects Morphogenesis and Flowering in Geranium Division of Applied Life Science (BK21 Plus), Graduate School, Gyeongsang National University, Jinju 52828, Korea .
19. **Pfeiffer , Christina A. (2019).** Mulch Matters. Horticulture Consultant & Educator. University of Washington. Botanic Garden.
20. **Runkle E S, Padhye S R, Oh W and Getter K (2012).** Replacing incandescent lamps with compact fluorescent lamps may delay flowering. *Scientia Hort* 143:56–61.
21. **Runkle, Erik (2018).** Horticultural Lighting Applications. department of horticulture, Michigan State University.
22. **Stowell, B. (2000).** Organic kiwifruit production—maintaining soil fertility and yields. *Kiwifruit* 139:18-21.
23. **Thakur, Meenakshi, Vinod Bhatt, Rakesh Kumar. (2019).** Effect of shade level and mulch type on growth, yield and essential oil composition of damask rose (*Rosa damascena* Mill.) under mid hill conditions of Western Himalayas. Manuel Joaquín Reigosa, University of Vigo, SPAIN.
24. **Whipker, Brian E. (2013).** Plant growth regulator guide. north carolina state university. grower talks.
25. **Younis, Adnan, Muhammad Zahid Mukhtar Bhatti, Atif Riaz, Usman Tariq, Muhammad Arfan, Muhammad Nadeem, and Muhammad Ahsan. (2012).** EFFECT OF DIFFERENT TYPES OF MULCHING ON GROWTH AND FLOWERING OF *Freesia alba* CV. AURORA. *Pak. J. Agri. Sci.*, Vol. 49(4), 429-433.
26. **Zoratti L. , Karppinen K, Escobar AL, Häggman H, Jaakola L (2014).** Light controlled flavonoid biosynthesis in fruits. *Front Plant Sci* 5:1–16.