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Effect of foliar nutrition on flowering parameters of spider lily (*Hymenocallis littoralis* L.) grown as intercrop in coconut garden under coastal littoral sandy soil

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Abstract

The present investigation entitled “Effect of nutrient management on flowering parameters of spider lily (*Hymenocallis littoralis* L.) grown as intercrop in coconut garden under coastal littoral sandy soil.” was carried out in 30 years old coconut plantation of AICRP on palms at Regional Coconut Research Station, Bhatye, Ratnagiri under Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli (M.S.) during the year 2023 to 2025. The experiment was laid out in randomized block design, comprising seven treatments, each replicated thrice, resulting in a total of 21 plots. The first season of the field trial was conducted from May, 2023 to March, 2024 and the second season was carried out from May, 2024 to March, 2025. Seven treatments were tried T₁-15 t FYM + NPK dose @ 300:100:50 kg /ha), T₂- RDF + 19:19:19 (N:P: K 1% Foliar spray), T₃- RDF + 19:19:19 (N:P: K 2% Foliar spray), T₄-RDF +13:0:45 (Potassium nitrate 1% Foliar spray), T₅- RDF +13:0:45 (Potassium nitrate 2% Foliar spray), T₆-RDF + 0:52:34 (Monoammonium phosphate 1% Foliar spray) and T₇- RDF + 0:52:34 (Monoammonium phosphate 1% Foliar spray). Minimum number of days (62.33 days after planting) taken to first spike emergence, minimum number of days to first flower emergence (72.50 days after planting) and minimum number of days (83.33 days after planting) required to reach 50% flowering was recorded in treatment T₇ RDF + 0:52:34 (Monoammonium phosphate 1% Foliar spray), while the delayed spike emergence (74.17 days after planting), maximum days taken to first flower emergence (83.17 days after planting) and maximum duration to 50% flowering (93.17 days after planting) was observed in treatment T₁ (15 t FYM + NPK @ 300:100:50 kg ha⁻¹).

Keywords: Spider lily, flowering and foliar nutrition

Introduction

Spider lily (*Hymenocallis littoralis* L.), is a bulbous ornamental plant belongs to the Amaryllidaceae family which is cultivated for its white mild sweet fragrant and spidery shaped flowers utilized in different ornamental preparation like *venies*, *gajras*, garlands etc. The flowers are in great demand during marriages and social ceremonies. Therefore, it has year-round market and has gained common importance. The name ‘spider lily’ comes from the shape of the petals, which resemble legs of spider. The plant is hardy, free of serious pests, diseases and other physiological disorders and it has earned a place among the traditional flowers in everyday life. The continuous and imbalanced use of fertilizer is leading to decrease in nutrient uptake efficiency of plants resulting in decrease in crop yield. It also causes problems like soil health, deterioration, ground water and atmospheric pollution etc. The problems like leaching, volatilization, denitrification of nitrogen and deposition of non-available phosphorous of soil are also the resultant of heavy use of chemical fertilizers (Maurya and Beniwal, 2003) [6]. Climatic conditions and soils of Konkan region are good for spider lily cultivation. Hence our goal is to increase quality, uniformity, speed of flowering determining best foliar spray and its foliar concentration for spider lily. Considering the economic importance of the crop, the present work is designed to study the “effect of foliar nutrition on flowering parameters of spider lily grown as intercrop in coconut garden under coastal littoral sandy soil.

Materials and Methods

The present investigation entitled “Effect of foliar nutrition on flowering parameters of spider lily (*Hymenocallis littoralis* L.) grown as intercrop in coconut garden under coastal littoral sandy soil.” was carried out in 30 years old coconut plantation of AICRP on palms at Regional Coconut Research Station, Bhatye, Ratnagiri under Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli (M.S.) during the year 2023 to 2025. The experiment was laid out in Randomized Block Design (RBD) with 7 treatments and 3 replications. Seven treatments were tried T₁-15 t FYM + NPK dose @ 300:100:50 kg /ha), T₂- RDF + 19:19:19 (N:P: K 1% Foliar spray), T₃- RDF + 19:19:19 (N:P: K 2% Foliar spray), T₄-RDF +13:0:45 (Potassium nitrate 1% Foliar spray), T₅- RDF +13:0:45 (Potassium nitrate 2% Foliar spray), T₆-RDF + 0:52:34 (Monoammonium phosphate 1% Foliar spray) and T₇- RDF + 0:52:34 (Monoammonium phosphate 1% Foliar spray). Spider lily (*Hymenocallis littoralis* L.) bulbs (5–10 cm) were planted at 60 × 60 cm spacing in a coconut garden (var. Banawali) spaced at 7.5 × 7.5 m. Interspaces were prepared by ploughing and harrowing, and plots (4.2 m × 3.6 m) were laid between palms. Planting was done at 2 m distance from the base of coconut trees. Foliar fertilizers (19:19:19, 13:0:45, and 0:52:34) were applied at 1% and 2% concentrations using a knapsack sprayer. Sprays were initiated at 60 days after planting (DAP) and repeated at 60-day intervals up to 300 DAP. Flowering parameters, namely days to first spike emergence, days to first flower emergence, and days to 50% flowering, were recorded from five randomly selected plants per treatment. The pooled data of two years were statistically analyzed using analysis of variance as per the method of Panse and Sukhatme (1995) [7].

Results and Discussion

The data on flowering parameters viz., days taken to first spike emergence, days taken to first flower emergence and days taken to 50% flowering was influenced by and inorganic fertilizers with RDF treatments are presented in Table1 and depicted in Figure 1.

Days required for first spike emergence (days after planting)

Pooled data on days taken to first spike emergence showed that minimum days (62.33 days after planting) taken to first spike emergence was found in treatment T₇ - RDF + 0:52:34 (2% foliar spray) followed by T₆ (64.83 days after planting), T₅ (67.67 days after planting) and maximum days (74.17 days) taken to first spike emergence was noticed in treatment T₁ (15 t FYM + NPK dose @ 300:100:50 kg /ha). Phosphorus and potassium play a key role in early flowering and reproductive development in bulbous ornamentals Marschner (2012) [5].

Foliar application of P and K reduced days to flowering and enhanced spike initiation in horticultural crops Yadav *et al.* (2013) [12]. Arancon *et al.* (2004) [1] also noted that organic amendments combined with balanced nutrients improved vegetative and reproductive growth, but direct foliar P application had a more pronounced effect on early spike emergence.

Days taken to first flower emergence (days after planting)

Data on the number of days taken to first flower emergence varied significantly among the treatments involving different inorganic fertilizers spraying with RDF, presented in Table 1 and depicted Figure1. Minimum days taken to first spike emergence (72.50 days after planting) was noted in treatment T₇ followed by T₆ (75.50 days after planting) and T₅ (78.50 days after planting) and maximum days taken to first flower emergence (83.17 days after planting) was observed in T₁ -15 t FYM + NPK dose @ 300:100:50 kg /ha. Earlier flowering due to phosphorus enrichment is supported by findings in bulbous and flowering crops where high phosphorus enhances floral primordia initiation (Salisbury and Ross, 1992) [11]. Foliar spraying of 0:52:34 supplied nutrients directly to actively growing meristems, rapidly stimulating metabolic processes and flowering hormones, resulting in earlier spike emergence (Raghunath and Shinde, 2015) [10]. Similar findings have been reported in gladiolus and China aster where higher P and K nutrition significantly reduced days to bud initiation and flowering compared to balanced NPK fertilizers (Kumar *et al.*, 2010; Patel *et al.*, 2020) [4, 9] and Patankar *et al.* (2023) [8] in China aster.

Days taken to 50% flowering (days after planting)

Minimum days (83.33 days after planting) taken to 50% flowering was observed in treatment T₃ i.e. (RDF + 0:52:34 2% foliar spray) followed by T₆ (84.83 days after planting) and T₅ (88.67 days after planting), and maximum days (93.17 days after planting) taken to 50% flowering was observed in T₁ (15 t FYM + NPK dose @ 300:100:50 kg /ha). The 0:52:34 foliar spray is rich in phosphorus (52%), a critical macronutrient involved in energy transfer (ATP, ADP), nucleic acid synthesis, and cell division. Phosphorus availability is directly linked to the initiation and development of floral meristems. Studies have shown that foliar sprays rich in phosphorus and potassium significantly reduce days to flowering by enhancing nutrient use efficiency in challenging soil environments (Fernández and Eichert, 2009; Kumar *et al.*, 2010) [4]. These findings aligned with previous reports noted by, Patankar *et al.* (2023) [8] in China aster and Kumar *et al.* (2025) [3] in strawberry (*Fragaria x ananassa* Duch.) cv. Camarosa in Kymore Plateau.

Table 1: Effect of nutrient management on days taken to first spike emergence (days after planting), days taken to first flower emergence (days after planting) and days taken to 50% flowering (days after planting) of spider lily (*Hymenocallis littoralis* L.) grown as intercrop in coconut garden under coastal littoral sandy soil

Treatments	Days taken to first spike emergence*	Days taken to first flower emergence*	Days taken to 50% flowering*
T ₁	74.17	83.17	93.17
T ₂	71.50	81.83	91.17
T ₃	70.50	81.50	91.50
T ₄	69.50	80.17	90.00
T ₅	67.67	78.50	88.67
T ₆	64.83	75.50	84.83
T ₇	62.33	72.50	83.33
Mean	68.64	79.02	88.95
F – Test	Sig	Sig	Sig
SE (m)±	0.38	0.72	0.54
CD at 5%	1.11	1.49	1.57

* -Days after planting

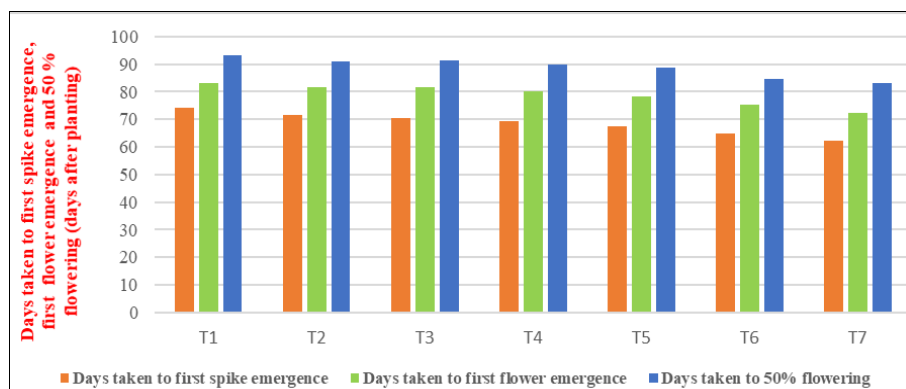


Fig 1: Effect of foliar nutrition on days taken to first spike emergence (days after planting), days taken to first flower emergence (days after planting) and days taken to 50% flowering (days after planting) of spider lily (*Hymenocallis littoralis* L.) grown as intercrop in coconut garden under coastal littoral sandy soil

Treatment Details

- T₁ – 15 t FYM + NPK dose @ 300: 100:50 NPK kg/ha)
 T₂ – RDF + 19: 19: 19 (1% foliar spray)
 T₃ – RDF + 19: 19: 19 (2% foliar spray)
 T₄ – RDF + 13: 0: 45 (1% foliar spray)
 T₅ – RDF + 13: 0: 45 (2% foliar spray)
 T₆ – RDF + 0: 52: 34 (1% foliar spray)
 T₇ – RDF + 0: 52: 34 (2% foliar spray)

Conclusion

The results of the present investigation clearly indicated that application of - RDF + 0: 52: 34 (2% foliar spray) recorded the minimum number of days to first spike emergence, first flower emergence and 50% flowering in spider lily.

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