

International Research Journal of Management Science & Technology



ISSN 2250 – 1959(Online)
2348 – 9367 (Print)

An Internationally Indexed Peer Reviewed & Refereed Journal

www.IRJ MST.com
www.isarasolutions.com

Published by iSaRa Solutions

EFFECT OF AZOTOBACTER ON GROWTH AND YIELD ON CHINA ASTER UNDER REDUCED NITROGEN LEVELS

Arvind Kumar

Deptt of Botany

S.M.P Govt. Girls P.G. College Meerut

Email- arvindkm031@gmail.com

An investigation was carried out to study the "effect of Azotobacter on growth and yield of china aster under reduced nitrogen levels" at Floriculture Unit, Department of Horticulture CCS University campus meerut, during the year 2002-2003. Results indicated that plant growth parameters i.e., plant height, stem girth, branches per plant, leaves per plant and leaf area per plant and flower yield were recorded maximum in soil application of Azotobacter along with 75% nitrogen.

INTRODUCTION

China aster (*Callistephus chinensis* L. (Nees)) is one of the important commercial flower used in landscape gardening as it has a spectrum of colours and long vase life which make them popular cut flowers. In modern agriculture, use of chemical fertilizers are essential for increasing yield but these are not ecofriendly. It is therefore, necessary to restrict their use to certain limit. The current trend is to explore the possibility of supplementing chemical fertilizers with organic fertilizers specially biofertilizers of microbial origin. Azotobacter is found to secrete growth promoting substances like auxins, gibberelins and cytokinins. (Rossario and Boser, 1975). Information on use of Azotobacter in china aster is scanty. Hence, in view of this, the present experiment was conducted to assess the effect of Azotobacter on growth and yield of china aster under reduced nitrogen levels.

MATERIALS AND METHODS

transplanting half dose of nitrogen was given from each level as per treatments along with full dose of P_2O_5 and K_2O and remaining half nitrogen was applied at 30 days after transplanting.

Observations on plant height, stem girth, number of branches, leaf area, number of flowers and flower yield per plant were recorded and analyzed statistically.

Table 1. Effect of Azotobacter on growth and yield of china aster under reduced nitrogen levels.

Treatments	Plant height (cm)	Stem girth (cm)	Branches per plant	Leaves per plant	Leaf area per plant (cm ²)	Number of flower		Flower yield	
						Per plant	Per hectare (lakh)	Per plant (g)	Per hectare (t)
T ₁ = A+100% N (Soil application)	50.75	1.59	22.10	87.50	49.02	36.90	40.99	96.86	10.74
T ₂ = A+75% N (Soil application)	58.72	1.74	26.45	92.15	51.72	39.60	43.99	107.20	11.62
T ₃ = A+50% N (Soil application)	36.20	1.31	20.05	73.75	42.17	30.55	33.93	60.63	6.73
T ₄ = A alone (Soil application)	30.85	1.16	19.60	54.40	36.47	18.95	21.05	36.55	4.05
T ₅ = A+100% N (Seedling application)	46.89	1.50	20.25	82.10	46.57	35.85	39.82	85.21	9.56
T ₆ = A+75% N (Seedling application)	47.72	1.61	20.95	84.45	47.09	36.60	40.66	94.59	10.50
T ₇ = A+50% N (seedling application)	37.17	1.29	20.75	72.45	40.33	26.45	29.38	44.64	4.95
T ₈ = A alone (Soil application)	30.53	1.21	16.37	54.80	33.17	18.90	20.99	34.53	3.83
T ₉ = Recommended fertilizer dose (150 : 50 : 50 kg NPK / ha)	43.35	1.37	19.43	79.55	45.11	35.15	39.71	87.51	9.71
T ₁₀ = Control	27.55	0.89	13.25	47.70	30.09	15.75	17.49	24.93	2.76
SE (m) ±	0.62	0.038	0.90	3.53	0.69	0.73	0.84	1.61	0.17
CD at 5%	1.75	0.10	2.53	9.91	1.95	2.06	2.38	4.53	0.49

Growth: Persual of Table 1 exhibited significant differenced among the treatments in respect of growth parameters. Treatment T₂, where Azotobacter was applied in soil along with 75% Nitrogen recorded maximum plant height (58.72 cm), stem girth (1.74 cm), number of branches per plant (26.45), leaves per plant (92.15) and leaf area per plant (81.72 cm²) followed by treatment T₁, where Azotobacter was applied in soil along with 100% nitrogen (50.75 cm, 1.59 cm, 22.10 cm, 87.50 cm and 49.02 cm respectively.) However, these were recorded minimum in control.

The increases in growth may be due to favourable action of biofertilizers which resulted in more availability of nitrogen and certain growth substances like auxines, gibberelins, vitamins and organic acids secreted by bionoculants as reported by Gupta et al., (1999) in marigold, Kulkarni (1990) in aster, Wange and Patil (1994) and Wange et al., (1995) in tuberose.

Yield: The maximum number of flowers (39.60/plant and 43.99 lakh/ hectare) and weight of flowers (107.20 g/plant and 11.62 t/ha) were produced by the plants where soil application of Azotobacter along with 75% Nitrogen was applied, followed by treatment T₁, where soil application of Azotobacter along with 100% Nitrogen was applied. However, minimum number of flowers (15.75/

plant and 17.49 lakh/ha) and weight of flowers (24.93g/plant and 2.76 t/hectare) were recorded in control. The Increase in the number and weight of flowers might be due to the favourable action of Azotobacter which helped in overall development of plant leading to produce better yield. These results are congruent with the results of Gupta et al., (1990) in marigold, Kulkarni (1990) in aster and Wange et al., (1995) in tuberose

REFERENCES

Gupta; N.S.; K.T. Sadawarte, V.K. Mohorkar, B.J. Jadhav and S.V. Dorak. (1999). Effect of graded levels of nitrogen and bioinoculants on growth and yield of marigold (*Tagetes erecta*). *J. Soils and Crops.*, 9: 80-83.

Kulkarni; R.G. (1990). Studies on effect of Azotobacter and Azospirillum alone and in combination under graded levels of nitrogen on growth and yield of aster. M.Sc. thesis (unpub.) MPKV, Rahuri.

Rossario, A and J.M. Boserá. (1975). Synthesis of auxins, gibberelin and cytokinins by *Azotobacter vinelandi* and *Azotobacter beijrenckii* related to effects produced on tomato plants. *Plant and Soil.* 19: 304-314.

Wange, S.S.; and P.L Patil. (1994). Response of tuberose to biofertilizers and nitrogen. *J. Maharashtra agric. Univ.*, 19:484-486.

Wange, S.S.; P.L. Patil and J.S. Patil. (1995). Effects of biofertilizers alone and with nitrogen levels on tuberose cv. Single petaled. *J. Soils and Crops.*, 5: 97-99



EARN YOUR MBA

WWW.IIMPS.IN



Accreditation & Ranking



UGC / NCTE Approved.

INFO@IIMPS.IN

☎ 011-41005174

R
S
E
A
R
C
H
G
A
T
E
W
A
Y

STOP PLAGIARISM



Arogyam Ayurveda
Holistic Healing through herbs



A
R
O
G
Y
A
M
O
N
L
I
N
E

PARIVARTAN PSYCHOLOGY CENTER



COLOR PSYCHOLOGY : HOW COLOR AFFECT YOUR CHILD



- BLUE** Calms your Child's Mind & Body
- YELLOW** Promotes Concentration, Stimulates the Memory
- PINK** Evokes Empathy, makes your Child Calm
- RED** Excites and energizes your Child's body
- GREEN** Improves Reading speed and Comprehension

www.parivartan4u.com



Confuse about your children's future?

भारतीय भाषा, शिक्षा, साहित्य एवं शोध

ISSN 2321 – 9726

WWW.BHARTIYASHODH.COM



**INTERNATIONAL RESEARCH JOURNAL OF
MANAGEMENT SCIENCE & TECHNOLOGY**

ISSN – 2250 – 1959 (O) 2348 – 9367 (P)

WWW.IRJMST.COM



**INTERNATIONAL RESEARCH JOURNAL OF
COMMERCE, ARTS AND SCIENCE**

ISSN 2319 – 9202

WWW.CASIRJ.COM



**INTERNATIONAL RESEARCH JOURNAL OF
MANAGEMENT SOCIOLOGY & HUMANITIES**

ISSN 2277 – 9809 (O) 2348 - 9359 (P)

WWW.IRJMSSH.COM



**INTERNATIONAL RESEARCH JOURNAL OF SCIENCE
ENGINEERING AND TECHNOLOGY**

ISSN 2454-3195 (online)

WWW.RJSET.COM



**INTEGRATED RESEARCH JOURNAL OF
MANAGEMENT, SCIENCE AND INNOVATION**

ISSN 2582-5445

WWW.IRJMSSI.COM



**JOURNAL OF LEGAL STUDIES, POLITICS
AND ECONOMICS RESEARCH**

WWW.JLPER.COM

JLPE