

DEDICATION

To my mother, father  
Husband  
Brothers, sisters  
And kids  
With my love and  
sincere thanks

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## **ABSTRACT**

This study was carried out at the Demonstration Farm of pomology, Department of Horticulture, College of Agricultural Studies, Sudan University of Science and Technology during the summer and winter seasons of the years 2006-2011. The objectives of the study were to identify the response of annuals flowering ornamental plants to plant spacing and nitrogen. Also the aim of the study was to assess the ability of annual flowering ornamental plants to produce seeds under Sudan condition.

The Plants included in this study were 1/Summer annuals: celosia (*Celosia cristata*) and zinnia (*Zinnia elegans*). 2/Winter annuals: snapdragon (*Antirrhinum majus*) and carnation (*Dianthus caryophyllus*). The F<sub>1</sub> seed for mentioned plants were imported from Holland, Denmark, Japan and Egypt.

Two experiments were carried out for each plant species. The experimental design was complete randomized block design. Computer program has been used for data analysis and Duncan multiple range test was used for comparison between the means. Experiment one: nitrogen (as urea) at level of 0, 25 and 50 kgN/fed fifteen days after transplanting of seedlings. Experiment two: Manure added at the rate of 0, 150 and 300 kgN/fed during land preparation. The plants were spaced at 20, 30 and 40cm. Data recorded and evaluated include vegetative growth (plant height, number of branches/plant and number of leaves/plant), flowers yield and quality and seeds yield and quality.

The results revealed that, application of different sources of nitrogen (urea or manure) promoted growth of both summer and winter annuals. It gave the highest values of growth. Addition (50KgN) of urea or 300 kg/fed manure gave the best vegetative growth of all tested plants in both seasons compared to 25 kgN/fedof urea and 150Kgs manure. High doses of both urea and manure delayed flowering in carnation and snapdragon. Moreover, flowers yield and quality, seed yield and quality were affected positively by addition of nitrogen.

The results showed that, increasing of plant spacing decreased plant height but increased number of branches/plant in all tested plants in both seasons. However, there were no significant effects on flower initiation of celosia and snapdragon. However, closer spacing delayed flowering of carnation. Maximum flowers yield and quality (number of flowers/plant or inflorescences, flower diameter and flower age) of celosia, zinnia, snapdragon, and carnation were recorded at spacing of 30 and 40cm. Maximum number of seeds, germination rate and uniformity of snapdragon were recorded at the wider spacing (40cm). Maximum number of seeds, germination rate and uniformity of celosia and carnation were recorded at closer spacing (20, 30cm).

## ARABIC ABSTRACT

### ملخص البحث

أجريت هذه الدراسة بمزرعة الفاكهة، قسم البساتين، كلية الدراسات الزراعية (شبات) جامعة السودان للعلوم والتكنولوجيا في الموسمين الشتوي والصيفي للأعوام 2006 - 2011 أجريت تجربتان في هذه الدراسة وكان الهدف منهما هو دراسة أثر مسافات الزراعة وسماد اليوريا والسماد العضوي على إنتاج نباتات الزينة وجودتها وإنتاج البذور وجودتها، حيث أجريت الدراسة على أربعة من نباتات الزينة الحولية المزهرة والتي شملت:  
1/الصيفية وهي: (1) السيلوزيا (2) الزينيا.  
2/ الشتوية هي: (1) حنك السبع (2) القرنفل  
والبذور المستخدمة في هاتين التجربتين هي  $F_1$  (هجين) تم استيرادها من كل من: الدنمارك، هولندا، اليابان. أما البذور مفتوحة التلقيح من معهد البحوث المصرية بجمهورية مصر العربية.

التصميم الاحصائي المستخدم في هاتان التجربتان هو التصميم العشوائي البسيط. وقد تم جمع البيانات وتحليلها إحصائياً واستخدم (Duncan Multiple Range test) D.M.R.T. للفصل بين المتوسطات.

المعايير المستخدمة شملت: قياسات النمو (طول النبات، عدد الأفرع وعدد الأوراق) وإنتاج الأزهار وجودتها (عدد الأزهار بالنبات، قطر الزهرة، لون الزهرة وعمر الزهرة) وإنتاج البذور واختبارات جودة البذور. أظهرت تلك المعايير المستخدمة في هذه الدراسة أن النيتروجين أياً كان مصدره (اليوريا والسماد العضوي) قد أعطي قيمة معنوية في كل من قياسات النمو وإنتاج البذور وجودتها، كما ظهر أثر المسافات المختلفة على القياسات أنفة الذكر تأثيراً معنوياً، فالمسافة 20سم أعطت قيمة أعلى في طول النبات في حين ازداد عدد الأفرع والأوراق، قطر الزهرة بازدياد المسافة (30 و 40سم).