

ABSTRACT

Two field experiments were carried out during the two successive winter seasons of 2000-2001 and 2001-2002 at EL-Khattara Experimental Farm, Fac. Agric., Zagazig University, to study the effect of water quantity (600, 1100, 1600, 2100 and 2600 m³/fed), farmyard manure (0, 15, 30 and 45 m³/fed), N and P (100, 75 and 50% of the recommended levels), nitroben (1.5, 3.0 and 4.5 kg/fed) and phosphorein (0.9, 1.8 and 2.7 kg/fed).

Irrigation of garlic at 2600 m³/fed and fertilization with 45 m³ FYM /fed gave the highest values of total dry weight /plant, total uptake of N, P and K by plant, yield of grade 1, 2 and 3, exportable, marketable and total yield. Water quantity at 600 m³/fed gave the lowest values of emaciation, sprouting and weight loss percentage in bulbs during storage period.

The interaction between water quantity at the rate of 2600 m³/fed and 30 or 45 m³/fed FYM recorded maximum values of total dry weight /plant, yield of grade 1, total, exportable and marketable yield.

Application of 120 kg N +90 kg P₂O₅+ 3 kg nitroben +1.8 kg phosphorein /fed recorded maximum values of total dry weight /plant, N, P and K total uptake by plant, yield of grade 1, grade 2, total, exportable and marketable yield, emaciation, sprouting and weight loss percentage in bulbs during storage, while biofertilizer only gave the lowest values of these characters.

Key words: Garlic, water quantity, farmyard manure and biofertilizers.

الموجز العربي

أجريت تجربتان حقليتان خلال موسمی شتاء ٢٠٠٠-٢٠٠١ و ٢٠٠١-٢٠٠٢ فی مزرعة الخطارة - التابعة لكلية الزراعة - جامعة الزقازيق . وذلك بهدف دراسة تأثير كميات مياه الري (٦٠٠، ١١٠٠، ١٦٠٠، ٢١٠٠ و ٢٦٠٠ م^٣/فدان) ، و كمية السماد البلدي (بدون ، ١٥ ، ٣٠ و ٤٥ م^٣ للفدان) ، والنيتروجين والفوسفور (١٠٠ ، ٧٥ و ٥٠ % من الموصى به) والنيتروجين (١،٥ ، ٣ و ٤،٥ كجم للفدان) والفوسفورين (١،٨ ، ٠،٩ و ٢،٧ كجم للفدان) منفردا أو فی توليفات على النمو ، والمحصول، والقدرة التخزينية لأبصال الثوم تحت ظروف الاراضی الرملية و كانت أهم النتائج المتحصل عليها كالتالی :

سجل ري الثوم بمعدل ٢٦٠٠ م^٣/ فدان وكذلك التسميد بمعدل ٤٥ م^٣ سماد بلدي للفدان أعلى القيم للوزن الجاف الكلي للنبات، والممتص الكلي من النيتروجين والفوسفور والبوتاسيوم بواسطة النبات، ومحصول الدرجة الأولى، والدرجة الثانية، والكلي، والقابل للتصدير، والقابل للتسويق وسجل ري الثوم بمعدل ٦٠٠ م^٣/فدان أقل القيم لكل من التفرغ والتزريع، والفقد فی الوزن لأبصال أثناء مدة التخزين.

سجلت معاملة التفاعل بين ري نباتات الثوم بمعدل ٢٦٠٠ م^٣ والسماد البلدي بمعدل ٣٠ أو ٤٥ م^٣ للفدان أعلى القيم لكل من الوزن الجاف الكلي للنبات ، وكذلك محصول الدرجة الأولى، والمحصول الكلي ، والقابل للتسويق ، والقابل للتصدير .

سجلت معاملة نباتات الثوم بمعدل ١٢٠ كجم نيتروجين + ٩٠ كجم فوسفور + ٣ كجم نيتروجين + ١،٨ كجم فوسفورين للفدان أعلى القيم لكل من الوزن الجاف الكلي للنبات ، والممتص الكلي من النيتروجين والفوسفور والبوتاسيوم بواسطة النبات ، ومحصول الدرجة الأولى والثانية، والمحصول الكلي ، والقابل للتسويق ، والتفرغ والتزريع ، والفقد فی الوزن لأبصال أثناء التخزين ، بينما سجلت معاملة الثوم بالسماد الحيوي فقط (النيتروجين + الفوسفورين) أقل القيم لهذه الصفات.

CONTENTS

	page
I. INTRODUCTION	1
II. REVIEW OF LITERATURE	3
III. MATERIALS AND METHODS	23
IV. RESULTS AND DISCUSSION	35
4.1 FIRST EXPERIMENT: EFFECT OF IRRIGATION WATER QUANTITY AND FARMYARD MANURE ON GROWTH, YIELD AND STORAGEABILITY OF GARLIC UNDER SANDY SOIL CONDITIONS	35
4.1.1 Plant Growth	35
4.1.1.1 Morphological characters	35
a. Effect of irrigation water quantity	35
b. Effect of farmyard manure	38
c. Effect of the interaction between irrigation water quantity and farmyard manure	41
4.1.1.2 Dry weight	41
a. Effect of irrigation water quantity	41
b. Effect of farmyard manure	47
c. Effect of the interaction between irrigation water quantity and farmyard manure	50
4.1.2 Leaf Pigments	53
a. Effect of irrigation water quantity	53
b. Effect of farmyard manure	55
c. Effect of the interaction between irrigation water quantity and farmyard manure	57
4.1.3 Plant Water Relations	60
a. Effect of irrigation water quantity	60
b. Effect of farmyard manure	63
c. Effect of the interaction between irrigation water quantity and farmyard manure	65

4.1.4 Plant Chemical Composition	68
4.1.4.1 Nitrogen , Phosphorus and Potassium contents	68
a. Effect of irrigation water quantity	68
b. Effect of farmyard manure	68
c. Effect of the interaction between irrigation water quantity and farmyard manure	71
4.1.4.2 Uptake and total uptake	71
a. Effect of irrigation water quantity	71
b. Effect of farmyard manure	74
c. Effect of the interaction between irrigation water quantity and farmyard manure	74
4.1.5 Yield and Its Components	77
a. Effect of irrigation water quantity	77
b. Effect of farmyard manure	82
c. Effect of the interaction between irrigation water quantity and farmyard manure	86
4.1.6 Bulb Quality	89
a. Effect of irrigation water quantity	89
b. Effect of farmyard manure	91
c. Effect of the interaction between irrigation water quantity and farmyard manure	93
4.1.7 Storageability	93
4.1.7.1 Emaciation percentage	93
a. Effect of irrigation water quantity	93
b. Effect of farmyard manure	97
c. Effect of the interaction between irrigation water quantity and farmyard manure	97
4.1.7.2 Sprouting percentage	101
a. Effect of irrigation water quantity	101
b. Effect of farmyard manure	104
c. Effect of the interaction between irrigation water quantity and farmyard manure	104
4.1.7.3 Weight loss percentage	104
a. Effect of irrigation water quantity	104
b. Effect of farmyard manure	109
c. Effect of the interaction between irrigation water quantity and farmyard manure	111

4.2 SECOND EXPERIMENT : EFFECT OF MINERAL AND BIOFERTILIZERS ON GROWTH ,YIELD AND STORAGEABILITY UNDER SANDY SOIL CONDITIONS --	114
4.2.1 Plant Growth -----	114
4.2.1.1 Morphological characters -----	114
4.2.1.2 Dry weight -----	118
4.2.2 Leaf Pigments -----	121
4.2.3 Plant Chemical Composition -----	124
4.2.3.1 Nitrogen , Phosphorus and Potassium contents -----	124
4.2.3.2 Uptake and total uptake -----	126
4.2.4 Yield and Its Components -----	128
4.2.5 Bulb Quality -----	132
4.2.6 Storageability -----	134
4.2.6.1 Emaciation percentage -----	134
4.2.6.2 Sprouting percentage -----	136
4.2.6.3 Weight loss percentage -----	136
V. SUMMARY AND CONCLUSION -----	141
VI. LITERATURE CITED -----	150
ARABIC SUMMARY -----	1-7

ABBREVIATIONS

DW	: Dry weight
EC	: Electric conductivity
<i>fed</i>	: Feddan (4200 m ²)
Fig	: Figure
FYM	: farmyard manure
FW	: Fresh weight
ha	: Hectar (10000 m ²)
p ^H	: Minus logarithm 10 , of H concentration
ton	: 1000 kg