

# بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ





# شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



# جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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# بالرسالة صفحات لم ترد بالأصل



**STUDIES ON SOME ENVIRONMENTAL FACTORS AFFECTING GROWTH  
AND YIELD PRODUCTION  
OF SWEET BASIL IN EGYPT**

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A Thesis Submitted in Partial Fulfillment  
Of  
The Requirement for the Doctor of Philosophy Degree  
In  
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Department of Environmental Agricultural Sciences  
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## ABSTRACT

Two experiments were performed in order to study the susceptibility of sweet basil to infection and production under organic and bio-fertilizer application. In the first experiment, the natural infection of *Ocimum basilicum* L. (sweet basil) by *Fusarium oxysporum* f.sp. *basilici* was assessed in three Governorates (Assuit, Beni-Suif and Fayoum); the highest infection was found in Beni-Suif Governorate. There are four different materials applied for the control of basil wilt disease, the fungicide (Topsin M-70 at 1.5 and 3 g/L), the bioagent ((Bio-Arc at 2.5 and 5 g/L), silicon (potassium silicate 2 & 4 g/L) and nano emulsion essential oils (lemon grass 8 ml/L & Citronella 8 ml/L). Topsin M-70 (3 g/L) resulted in the highest increase in plant height infected with *Fusarium* in both seasons recorded (1<sup>st</sup> season 39.00 cm and 2<sup>nd</sup> season 39.75 cm), while the nano citronella 8 ml/L gave the lowest plant height (34.23 & 34.82 cm) in both seasons (34.23 & 34.82 cm) for 1<sup>st</sup> and 2<sup>nd</sup> seasons, respectively. Bio-Arc at 5 g/L considered the most significant treatment in increasing the branches fresh weight (40.53 & 41.32 g) for 1<sup>st</sup> and 2<sup>nd</sup> seasons respectively, while the highest effect of bioagent for branches dry weight (12.65 & 13.20 g) for 1<sup>st</sup> and 2<sup>nd</sup> seasons. Bioagent ((Bio-Arc 5 g/L) gave the highest effect on root length (12.43 & 12.98 cm) root fresh weight (15.48 and 16.01 g) and root dry weight (6.68 and 6.94 g) for first and second season respectively. As well as, essential oil content in sweet basil tissues infected with *Fusarium* gave highest value using (Bio-Arc at 5 g/L treatment into two seasons (0.07%) both seasons.

In the second experiment, a pot experiment was performed using recommended doses of N and P fertilization, Azospirillum (10 cm<sup>3</sup> suspension), Azotobacter (10 cm<sup>3</sup> suspension), Azospirillum + Azotobacter

(10 cm<sup>3</sup> suspension), Compost at 80, 160, 240, 320 and 400 g/ pot, Compost at 80, 160, 240, 320 and 400 g/ pot + Azospirillum, Compost at 80, 160, 240, 320 and 400 g/ pot + Azospirillum and Compost at 80, 160, 240, 320 and 400 g/ pot + Azospirillum + Azotobacter. The obtained results could be summarized as: the treatment using compost 400 g with 10 cm<sup>3</sup> bacterial suspension (Azotobacter and Azospirillum) both seasons recorded the highest values of plant height, number of branches/plant, fresh and dry weight of basil as well as N and P concentration, essential oil and its components. The highest values of the volatile oil of basil the linalool 53.32% in 400 g with 10 cm<sup>3</sup> bacterial suspension (Azotobacter and Azospirillum). Eugenol was 22.178% in mean time, when potts were treated 80 g with 10 cm<sup>3</sup> bacterial suspension (Azotobacter), Camphor was 11.12% at 320 g with 10 cm<sup>3</sup> bacterial suspension (Azotobacter and Azospirillum). Methely chavicol was 9.51% in 10 cm<sup>3</sup> bacterial suspension (Azotobacter and Azospirillum) and B-pinane was 8.6 % in 320 g with 10 cm<sup>3</sup> bacterial suspension (Azotobacter and Azospirillum) concerning of count of Azotobacter and Azospirillum in soil which recorded the highest values with the addition of 400 g compost with the mixture of Azotobacter and Azospirillum.

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