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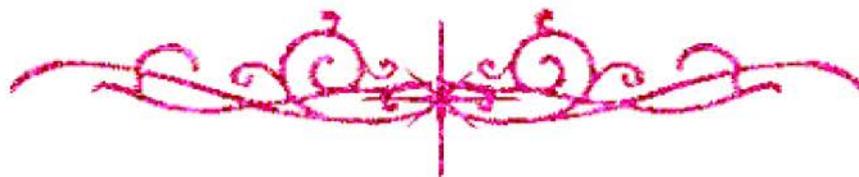
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**MANAGEMENT OF POTATO BACTERIAL WILT
DISEASE USING BIOTIC AND ABIOTIC
TREATMENTS**

By

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B.Sc. Sc. (Biology), Omar Al-Mukhtar Univ., Libya, 1995

M.Sc. Agric. Sc. (Plant Pathology), Omar Al-Mukhtar Univ., Libya, 2008

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ABSTRACT

Hanan, Saleh Abd Rabbo Mostafa; Management of Potato Bacteria Wilt Disease Using Biotic and Abiotic Treatments, unpublished Ph.D. Thesis, Department of Plant Pathology, Faculty of Agriculture, Ain Shams University, 2019.

Potato bacterial wilt disease caused by *Ralstonia solanacearum* is one of the most important bacterial diseases over the world. This study was planned to isolate and identified of potato the causal organism using traditional and modern techniques and control the disease using some biotic and abiotic agents individually and / or in combination. Isolation of the pathogen was made from samples of infected potato tubers on the modified Semi Selective South Africa (SMSA) medium selective for the pathogen. Pathogenicity test was carried out on tomato seedlings and tobacco plants (3-leaves). The symptoms were recorded wilting, stunting and yellowing of foliage compared with non-inoculated seedlings as control treatment. five pathogenic isolates were identified according to morphological, cultural, Physiological and biochemical characteristic. Also, Serological (IFAs) and molecular (PCR) tests were applied to confirm the identification of the pathogen. Accordingly, isolates were identified as *R. solanacearum*. *In vitro*, tested bactericides (cefalexin, gentamycin and copper sulphate) inhibit the growth of *R. solanacerum* compared with control treatment. Copper sulphate was the most effective compared with cefalexin and gentamycin, but cefalexin was moderately effective and gentamycin was less effective against the pathogen. Inhibition zone diameter was increased with increasing concentrations of tested bactericides Application of different bio-agent isolates (*Pseudomonas fluorescense*, *Bacillus subtilis*, *Bacillus megaterium* and *Serratia marcescens*) reduced the growth of the pathogen compared with control treatment. *B. subtilis* isolate was the most effective, but isolates of *Ps. fluorescens* and *B. megaterium* were moderately effective and *S. marcescens* isolate was less effective against the pathogen. *In planta*

experiments, bactericides, resistance inducers and bio-agents reduced the severity of potato bacterial wilt disease and increased potato yield compared with control treatment. Cefalexin and gentamycin as bactericides, salicylic acid and jasmonic acid as resistance inducers and isolate of *B. subtilis* as bio-agent were the most effective compared with other treatments. Application of tested bactericides as soil drench treatment was more effective than tuber treatment, but application of Resistance inducers as foliar treatment were more effective than tuber treatment and Application of *B. subtilis* and *B. megaterium* isolates as soil drench treatment were more effective than tuber, but application of *Ps. fluorescence* isolate as tuber treatment was more effective than soil drench treatment against the disease and the yield. Disease severity were decreased and potato yield were increased with integration between resistance inducers factors (Salicylic acid and Jasmonic acid) and bio-agents (*Bacillus subtilis*, and *Pseudomonas fluorescence* isolates) or resistance inducers factors and Antibiotics (cefalexin and gentamycin) or Antibiotics and bio-agents compared with control treatment However, integration between bactericides as soil drench treatment and Resistance inducers as foliar treatment were the most effective against the disease and the yield. or integration between bio-agents as tuber treatment and Bactericides as soil drench treatment. But, integrations between bio-agents as soil drench treatment and resistance inducers as foliar treatment were moderately effective to control the disease and increased the yield. But, integration between cefalexin as bactericides and *Ps. fluorescence* isolate as bio-agent or Salicylic acid as resistance inducer were the most effective on disease severity and the yield in compared with other treatments, but the integration between *B. subtilis* isolate as bio-agent and jasmonic acid as Resistance inducer were less effective compared with other treatment.

Key words: Bacterial wilt; Potato; biotic agents; abiotic agents; *Ralstonia solanacearum*; control; bio-agents; resistance inducers.

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