

**PEANUT CERCOSPORA LEAF SPOT  
DISEASE MANAGEMENT**

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## ABSTRACT

Cercospora leaf spot disease was surveyed in six different peanut regions grown under three different irrigation systems in five Governorates of Egypt during 2014 and 2015 growing seasons. El- Menofia Governorate (El- Khatatba Region) showed the lowest Cercospora leaf spot disease parameters. Ismailia-1 cultivar, followed by R92 were the most resistant cultivars to Cercospora leaf spot disease (CLS) and recorded the highest peanut pod yield in both seasons (2016&2017). However, Gregory, followed by Virginia were the most susceptible ones recording the lowest peanut pod yield in both seasons (2016&2017). The genetic diversity among six peanut cultivars, *i.e.* Giza 5, Giza 6, R92, Ismailia 1, Gregory and Virginia using RAPD and ISSR techniques revealed a total of 27 major scorable bands ranging from 282 to 1871 bp generated from five RAPD primers showing 14.26% polymorphism. While, a total of 37 scorable bands ranging from 255 to 2900 bp were produced from five ISSR primers detecting 26.53 % polymorphism. Unique bands were produced by both ISSRs and RAPDs. Genetic similarity values were ranged between 91.7- 100 % and 85.7- 98.4 % for RAPD and ISSR, respectively. The lowest similarity using ISSR primers was observed between Gregory and Virginia cultivars. While, the lowest similarity using RAPD primers were found between cultivars Virginia and Giza 6. The dendrogram based on RAPD, ISSR and combined data of RAPD and ISSR separated the six peanut cultivars into two main clusters at a similarity coefficient of 0.25. Also, the dendrogram based on the

combined data of both ISSR and RAPD displayed considerably similar results to those obtained from individual ISSR analysis.

Effect of different agricultural practices on CLS disease criteria and pod yield of peanut and different disease control ways were investigated during two growing seasons (2016 and 2017). Drip irrigation system, was the best for decreasing *Cercospora* leaf spot and increasing pod yield. First May was the best sowing date for decreasing CLS disease resulting the highest pod yield. Irrigation every two and three weeks exhibited the best irrigation treatment in this regard. Sowing distance between peanut plants at 20 & 25cm and planting peanut at two rows in plot were the best criteria in reducing *Cercospora* leaf spot showing the highest peanut pod yield. Thirty unit of nitrogen fertilizer (Urea 46%) was the best treatment for minimizing *Cercospora* leaf spot and maximizing peanut pod yield. Peanut cultivated after wheat, peanut plus maize intercropping system and less weed intensity recorded the lowest CLS disease and the highest peanut pod yield. Effectiveness of different materials used for induction of peanut CLS disease resistance was investigated. Bion and salicylic acid both at 8mM were the most effective chemical inducers for decreasing peanut CLS and increasing peanut pod yield. Also, naphthalene acetic acid (NAA) and indole butyric acid (IBA) at 200ppm were the most effective growth regulators to obtain promising disease control and consequently increased peanut pod yield production. Copper sulphate ( $\text{CuSO}_4$ ) revealed the least CLS disease criteria and the highest peanut pod yield. On the other hand, calcium silicate ( $\text{CaSiO}_3$ ) and potassium silicate ( $\text{K}_2\text{SiO}_3$ ) were the most

silicate minerals for decreasing CLS and increasing peanut pod yield. The activity of oxidative- reductive enzymes *i.e.* peroxidase and polyphenol oxidase as well as the amount of phenol contents were obviously higher in tissues of peanut leaves that were treated with any of the tested inducers than those untreated (control). Garlic and cumin plant extracts and oils at 2% were the most effective treatments for minimizing Cercospora leaf spot and consequently maximizing peanut pod yield production. *Pseudomonas fluorescense* and *Trichoderma harzianum* were the best antagonistic bio- agents in controlling CLS disease and exhibiting the highest pod yield. Bio-Zied proved to be the best commercial bio products for decreasing CLS disease criteria and increasing pod yield. Score and rush up were the most effective fungicides for minimizing CLS and increased pod yield.

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