

**EFFECT OF SOME AGRICULTURAL PRACTICES  
ON GROWTH AND YIELD OF CANOLA UNDER  
SALINE CONDITIONS**

**BY**

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## **Approval sheet**

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## ABSTRACT

**Essam Mohamed Mohamed El-Sadany, Effect of some agricultural practices on growth and yield of canola under saline conditions. Unpublished Doctor of Philosophy Dissertation, Agronomy Department, Faculty of Agriculture, Ain Shams University (2005).**

Three field trials were carried out in the agricultural experimental station of Desert Research Center at Ras Sudr, South Sinai Governorate, Egypt during 2001/2002 and 2002/2003 growing seasons. These trials were conducted to study the effect of canola transplanting at different ages (4, 6 and direct seeding in the 1<sup>st</sup> growing season, 4, 6, 8 and direct seeding in the 2<sup>nd</sup> one) and plant density (20, 30 and 40 plants/m<sup>2</sup>) on some growth characters, chlorophyll and proline contents in leaves, yield and yield attributes of two canola varieties (Pactol and Serw 4) under calcareous soil conditions ( $> 50\% \text{ Ca CO}_3$ ) using saline water irrigation (3500-4000 ppm in the 1<sup>st</sup> growing season, 3900-4400 ppm as low levels and 7100-7900 ppm as high level in the 2<sup>nd</sup> one).

Results exhibited that transplanting canola seedlings at any ages, as compared with the direct seeding, as a common practice under low or high saline water irrigations significantly improved all growth characters, except the 1<sup>st</sup> branch height, yield and yield attributes, except harvest index. This enhancement was more obvious with increasing ages of transplants up to 6 and, to some extent, 8 weeks. The 1<sup>st</sup> branch height was reduced significantly by increasing canola transplant ages. In most cases, chlorophyll content of canola leaves, seed weight and number of seeds/silique and oil percentage was not affected significantly by planting method. However, transplanting canola seedlings at 4 weeks had a significant reduction in leaf proline content either under low or high saline water irrigations.

Pactol canola variety surpassed significantly Serw 4 variety in plant height, 1<sup>st</sup> branch height, fresh and dry weight/plant and leaf area index. Also, this was true for plant height at harvest, seed yield/plant, seed yield/fed., biological yield, oil yield and oil percentage. Whereas, canola varieties (Pactol and Serw 4) did not

differ significantly in some growth characters (number of branches/plant, specific leaf weight and chlorophyll content). Moreover, number of branches/plant, seed weight/silique, number of seeds/silique, 1000-seed weight and harvest index were not affected significantly by canola varieties under low or high saline water irrigations.

Regarding the effect of plant density on growth characters, plant height, 1<sup>st</sup> branch height and leaf area index as well as proline content in canola leaves were increased significantly by increasing plant density from 20 to 40 plants/m<sup>2</sup>. Whereas, number of branches/plant, fresh and dry weight/plant as well as specific leaf weight reduced significantly by increasing plant density, although chlorophyll content did not reach to a significant level of 5% under both saline water irrigations. The most yield attributes, i.e. number of branches/plant, seed weight/silique, 1000-seed weight and seed yield/plant were reduced significantly by increasing plant density. The reverse was true for plant height at harvest. While, number of seeds/silique, harvest index and oil percentage, in most cases, did not affected significantly by plant density particularly under high saline water irrigation. However, the middle plant density (30 plants/m<sup>2</sup>) gave the highest values of seed, biological and oil yields/fed. under both saline water irrigations with tended to in Pactol canola variety than that of Serw 4 canola variety. Transplanting canola Pactol variety at 6 and, to some extent, 8 weeks had a positive effect on the most of growth characters and yield attributes either under low or high saline water irrigations. Moreover, transplanting at 6 weeks at 30 plants/m<sup>2</sup> had the highest values of seed, biological and oil yields/fed.. These increments may be due the higher values of the most yield attributes.

It is concluded that transplanting canola plants at 6 weeks is a surer technique for improving salt tolerance of canola plants under salinity and calcareous soil conditions at south Sinai Governorate, Egypt.

**Key Words:**

Saline water irrigation, Canola varieties, Transplanting, Plant density.

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