ISSN 1110-0419

*Annals Of Agric. Sc., Moshtohor,*
*Vol. 46(4): Bo. 55-69, (2008).*

# EFFECT OF NITROGEN FERTILIZER RATES AND DATE OF SOWING ON RUST DISEASE OF SUGAR BEET

BY

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## ABSTRACT

***This*** study was carried out during 2004/2005, 2005/2006, 2006/2007 and 2007/2008 seasons, at Sakha Agricultural Research Station, Kafr El-Sheikh, Egypt, to study the effect of nitrogen levels and date of sowing of sugar beet on disease incidence of rust disease caused by *Uromyces betae*. A general survey of sugar beet rust disease was carried out during 2004/2005 season in the four major sugar beet growing governorates, i.e. Kafr El-Sheikh, Gharbia, El-Dakahlia and Damietta. Data showed that Kafr El-Sheikh Governorate ranked the first for disease incidence followed by El-Dakahlia. Top cv. recorded the highest disease severity. Ten sugar beet cvs. were artificially inoculated in screenhouse during 2005/2006 season using urediospores suspension when the plants were 90 days old, compared with protected plants using Sumi-8 (35 $cm^3$/100 L). Disease severity %, chlorophyll content, root weight/plant, TSS%, sucrose %, and purity % were significantly increase under protected conditions for most of the cvs. Top cv. showed the lowest infection, while Pleno cv. was the highly infected one Top and Fareda cvs. gave good results for all the studied characters. In addition two experiments were conducted in the field to study the effect of nitrogen fertilizer levels (0, 90 and 120 kg urea/fed.) and date of sowing (Sept., 15, Oct. 15 and Nov. 15) on rust infection and some other related characters for sugar beet cvs. (Pleno, Ras Poly, Fareda and Top) during 2006/2007 and 2007/2008 seasons. The level of 90 kg urea/fed. gave good results for all studied characters followed by the protected plots. Regarding date of sowing and its relation to disease incidence of rust under three dates of sowing i.e. September 15$^{th}$, October 15$^{th}$, and November 15$^{th}$, by using four sugar beet cvs. in the previous experiments. Split plot design was used also in this experiment. Data showed that there were significant differences between date of sowing and incidence of rust disease severity for the tested cvs. the least disease severity was obtained from the first date of sowing; September 15$^{th}$ for all cvs., while high disease severity values were obtained for the plants grown on November 15$^{th}$. Under both protected or non-protected conditions. Significant differences were obtained for root weight and TSS% for the three dates of sowing and the four cvs. sucrose (%) was high when grown on September 15$^{th}$ for all cvs. tested, while it recorded the least when sown on November 15$^{th}$. Purity % was affected also by dates of sowing. In general loss % either in sucrose or in root were less when sown on September 15$^{th}$, while, it recorded the highest when sown on November 15$^{th}$, AUDPC behaved the same as loss% of sucrose and root yield, increased by delaying the date of sowing.

## INTRODUCTION

Symptoms of rust disease caused by *Uromyces betae* consists of small rust orange-yellow pustules surrounded by chlorotic haloes scattered over both leaf surfaces, sometimes, occurring in clusters. Late summer symptoms consist of darker brown, more eventually spread pustules. The disease usually occurs too late in the season and