Optimization of yield and quality of sugar beet in clay and sand soil in Egypt

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Abstract

Lack of appropriate weather conditions for flowering sugar beet under Egyptian condition led to import its seeds annually or at most every two years from aboard. So, we need to optimize its production by selecting the appropriate cultural treatment periodically. Three experiments with three replications were conducted at a Private Farm, Ferrmon Village, Dessok Province, Kafer El-Sheikh Governorate and at a Privet Farm, El Emam Mallek Village, El Nubaria Province, El Behera Governorate during 2007/08 and 2008/09 seasons to study the effect of (i) three sowing dates (29/8, 12/9 and 2/10/2008), (ii) plant density (38400, 57600 and 76800, 86400 and 96000 plants ha⁻¹) with two methods of cultivation (growing in lines and terraces) (iii) sources of nitrogen fertilizers (urea (46% N), ammonium nitrate (33.3% N) and ammonium sulphate (20.6 %N)) with three levels (360, 480 and 600 kg N ha⁻¹) on yield and quality of sugar beet plants grown on clay soil. We can summarize the obtained results as follow:

Growing sugar beet in clay soil at the late date of planting (first October) gave the highest root yield and highest sucrose % compared with the early dates of planting (first and 15 September).

Growing sugar beet in clay soil at plant density of 86 400 plants ha⁻¹ increased the crop yield (roots) by 41% compared to 38 400 and 57 600 plants ha⁻¹, while increasing the density to 96 000 plants ha⁻¹ decreased sugar beet yield.

Application of different sources and rates of nitrogen fertilizer had the same effect on root–knot nematode infestation and root yield (t ha⁻¹) either it grown in clay soil irrigated by flooding or grown in sand soil irrigated by sprinkler system.

The different rates of application from nitrogen fertilizers, 240, 360 and 480 kg ha⁻¹ in the clay soil and 360, 480 and 600 kg N/ha in the sand soil had the same effect on the sugar beet crop.

Key words: sugar beet, N-fertilizers, plant density, sowing date, root and sucrose yield

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