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Summary

Two field experiments were carried out the Agriculture Research and Services Center, Sohag Faculty of Agriculture, South Valley University, during two growing seasons 2002/2003 and 2003/2004. This work aimed to fined out the effect of varieties, weed control, plant spaces and their interactions on growth, yield and yield components as well as quality of sugar beet (*Beta vulgaris* L.) in newly reclaimed lands of Sohag Governorate.

The experiments were laid out in a split-split plot design with four replications. The main plots were assigned to varieties (Recolta-poly, Pamela and KWS-9422), The sub-plots were allocated with three weed control treatments (hand weeding, hand hoeing and herbicide) and the sub-sub plots were occupied with four planting spaces (10 cm, 15 cm, 20 cm and 25 cm).

The most important results obtained from this investigation can be summarized as follows :

I- Weed characters :

- 1- Varieties significantly differed in all studied weed characters, i.e. dry weight of narrow leaves weed, dry weight of broad-weeds and dry weight of total weeds at 90 and 120 days age in both seasons. Pamela variety resulted the greatest reduction in the mentioned traits at 90 and 120 days in both seasons, while KWS-9422 variety gave highest increment.
- 2- Weed control treatments gave significant effect on dry weight of narrow and broad weeds as well as total weeds at 90 and 120 days in both seasons. Application of Select Super + one hand hoeing

resulted significant reduction in dry weight of narrow-leaved weeds, while hand hoeing three times gave significant reduction in dry weight of broad-leaved and total weeds, this was true at 90 and 120 days in the two seasons.

- 3- Planting spaces gave significant effect on all studied weed traits at 90 and 120 days in the two seasons. 10 cm planting space recorded significant decrease in narrow, broad and total weeds at 90 and 120 days in both seasons. On the other hand, planting space of 25 cm resulted the highest increase.

II- Sugar beet characters :

A- Growth characters :

- 1- The effect of varieties on growth characters, i.e. length and diameter of root, leaves number/plant, LAI, root and leaves weight/plant and T.S.S % at most ages in both seasons. Pamela variety produced the highest values of all mentioned traits, except root/top ratio, which produced the highest value from KWS-9422 variety at most ages in both seasons.
- 2- Hoeing treatments gave the highest values of all growth characters at all sampling periods in both seasons. The differences were significant.
- 3- All growth characters affected significantly by planting spaces in both seasons. The tallest root resulted from 10 cm apart, root/top ratio and T.S.S% recorded the highest values from 20 cm between hills. Planting space of 25 cm gave the greatest values of root diameter, leaves number/plant as well as fresh root and leaves weight/plant. 15 cm between hills gave the highest LAI with significant differences.

B- Yield and yield components :

- 1- The influence of varieties on length and diameter of root, fresh weight of root and leaves/plant and yields of root, top and sugar/fed was significant. Pamela variety produced the greatest value for all mentioned traits in both seasons, while KWS-9422 variety gave the lowest ones.
- 2- Using hoeing treatment had significant effect on all studied traits of yield and yield components. Using hoeing treatment achieved the maximum values in both seasons.
- 3- Using 10 cm as space between hills gave the tallest roots. The highest value of fresh leaves weight resulted by 25 cm apart, while 20 cm recorded the highest values of root diameter, fresh root weight and yields of root, top in the first and sugar yield.

C- Juice quality :

- 1- Sugar beet varieties under study significantly differed in T.S.S%. sucrose% and purity%. Sugar beet variety KWS-9422 recorded the highest T.S.S% in both seasons, while Pamela variety gave the greatest values of sucrose% and purity% in both seasons.
- 2- The highest value of T.S.S% obtained by applying herbicide as weed control in both seasons, while the hoeing treatment was associated with the maximum values of sucrose percentage and purity percentage in both seasons.
- 3- The effect planting spaces on juice quality traits, it was significant in both seasons. The highest values obtained from 20 cm between hills in two seasons.

Conclusion :

In general, planting Pamela variety at 20 cm between hills and using hoeing treatment at 20, 40 and 60 days from planting under gave the greatest sugar yield/fed.