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SOME MORPHOLOGICAL PROPERTIES OF DIRECT SOWED SWEET CORN

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Abstract

In our trial we compared the effect of propagation time and floating cover on the growing season on some valuable properties of sweet corn. The following technological variations were compared with the help of the variety Spirit (normal sweet, very early ripening): 1. direct seeded plants with floating cover (with 2 sowing dates); 2. direct seeded plants without cover (with 2 sowing dates). The covering by earlier sowing time had favourable influence on plants highness, ear weight, ear length and no influence on tassels length, and dept of seeds. The covering by later sowing time had favourable influence on tassels length, ear weight, ear length and dept of seeds and no influence on plants highness.

Key words: *sowing time, plants covering.*

INTRODUCTION

Based on its present growing area, the sweet corn is the vegetable which is grown on the greatest area in Hungary. After dates of Hungarian Fruit & Vegetable Interprofessional Organization in 2003 the growing area was about 38,000 hectares. After 2003 followed a sudden and sharp decline, so in 2005 the growing area was "just" 24,000 hectares. After diminishing, the plant returned in rise, in 2006 against over 30,000 hectares.

As early as in the beginning of the 20th century some researchers (Cserháti, 1901) highlighted the importance of the sowing date. Ripening can occur earlier when sowing earlier and using high quality seeds as compared to normal or late sowing. I'só (1969) and Pásztor (1966), after their multi-year sowing date trial, concluded the following: in the case of an earlier sowing seed germination will be more protracted, but from the point of view of fruit maturing it was more favourable than late sowing.

Also I'só and Szalay (1966, 1969), studied occur of maize generative phenophases. They concluded, that by earlier sowing germination will be more protracted, but silking and harvesting occur sooner than by lately sowing time.

After multi-year trial Berzsenyi et al. (1998) have studied the effect of different sowing times on maize development. Direct seeded sweet corn under vlies cover showed earlier ripening and gave better yields in the experiments of Kassel (1990).

In case of direct seeding, as propagation method, another earliness increasing solution is the temporary covering with plastic or vlies, used in different combinations (Hodossi and Kovács, 1996).

About the covered early sowing as a technological variation (Aylswirth, 1986) mentioned, that from an early sowed crop, made in first week of April, arranged in twin rows (42 cm) and covered by plastic, we could harvested marketable cobs.

MATERIALS AND METHODS

The experiment was set up in 2008 on an area equipped for irrigation at the Experimental Farm of the Faculty of Horticulture of the Corvinus University of Budapest.

The results of the analysis of the soil sample collected at the beginning of 2006 from the trial area prior to direct seeding are contained in Table 1.

Table 1. Soil analysis results

pH_{H2O}	Salt %	Humus %	K_A	P_2O_5 mg/kg	K_2O mg/kg	$CaCO_3$ %
8,03	0,035	1,31	<30	293	205	<1

The pH of soil was considered calcarous. The nutrient content of soil in nitrogen was low, in phosphorus very good and in potash good.
The test variety was Spirit, a normal sweet corn with a very early growing period (85 days). Average plant height is 159 cm, ear height is 37 cm. Average ear length was 19.6 cm in the variety comparison trials carried out by the Central Agricultural Office and average ear weight was 245 g (Kovács, 2002).
The following treatments were applied during the experiment:
P1 = uncovered direct seeded (April 8th), P2 = covered direct seeded (April 8th), P3 = covered direct seeded (April 21th), P4 = the control, uncovered direct seeded (April 21th).
By both sowing times (April 8th and April 21th) a part of the stand was covered with Novagryl floating row cover having a weight of 19 g/m^2 at the two propagation times in order to enhance earliness. The floating row cover was removed on May 13th. The stand was created to contain 60,607 plants per hectare, according to the recommendations of the owner of the variety, at a spacing of 110+40x22 cm in twin rows. Each plot had an area of 6x7m (8 parallel rows and 30 seeds sown in each row). The edge was the outer two rows of the 8 rows of the plot, respectively. All treatments were set up in four replications.
Fertilization was done by top dressing with N. No farmyard manure was applied.
During the experiment, we studied some plant morphological properties according to the following:
highness of plants (cm), length of tassels (cm),
Ears, together with the husks, were collected from the four central (two twin) rows. After that 20 ears of average appearance were selected from each row and the following measurements were carried out: unhusked ear weight (gram), total ear length (cm), depth of seeds (mm).
The statistical analysis of the results was carried out by using the programme RopStat 1.1. When the standard deviations were identical the mean values were compared by pairs using the Tukey-Kramer test, while in the case of the non identical standard deviations the means were compared using the Games-Howell test (Vargha, 2007).

RESULTS AND DISCUSSIONS

The highness of plants (cm) is represented in the figure 1.

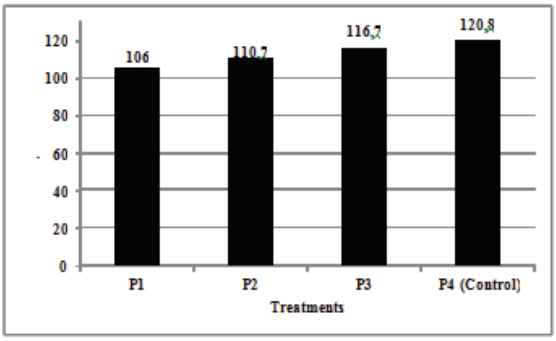

Figure 1. Highness of plants

The effect of covering (P2) was favourable on plant high compared to uncovered (P1) treatment by earlier sowing time. The highest value of plant highness was registered by plants of (P4 control) treatment, difference was significantly (at $p<0.01$ level), compared to earlier sowed (P1) uncovered and P2 (covered) treatments. Among other treatments plant highness no significantly difference.
Evolution of tassels length (cm) is summarised on figure 2:

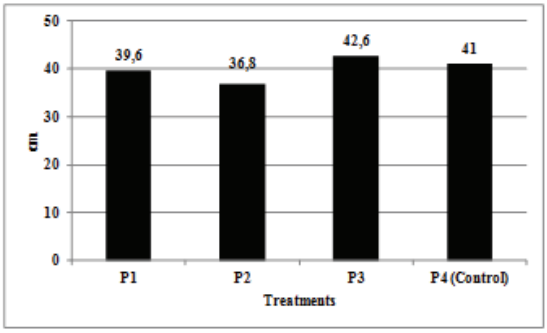

Figure 2. Tassels length

In case of tassels length the time of later sowing has greater influence. Plants from later sowed covered (P3) and uncovered, control (P4) treatments had significantly (at $p<0.01$ level) longer tassels compared to earlier sowed covered (P2) treatment and longer, but not significantly, compared to earlier sowed uncovered (P1) treatment.

The unhusked ear weight (g), one of the major yield parameters, is illustrated in figure 3.

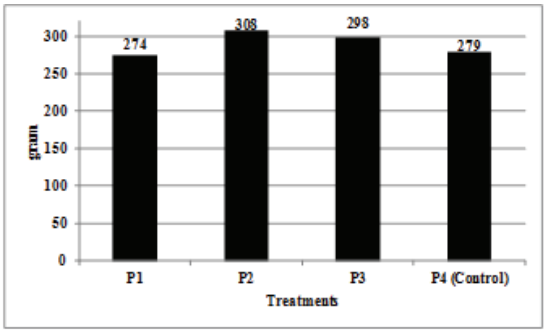

Figure 3. Unhusked ear weight

Analysing the measured data for unhusked ear yield, we saw that the average weight of the ears of the treatment P2 (earlier seeded, covered plants) was significantly (at $p<0.01$ level) higher as compared to the other treatments.

The average unhusked ear weight of the P3 treatment (later seeded, covered plants) was significantly higher (at $p<0.01$ level) compared to the uncovered treatment P1 and higher, but not significantly, compared to P4 treatment.

The data concerning, an important characteristics for market appeal, total ear length (cm) are contained in figure 4.

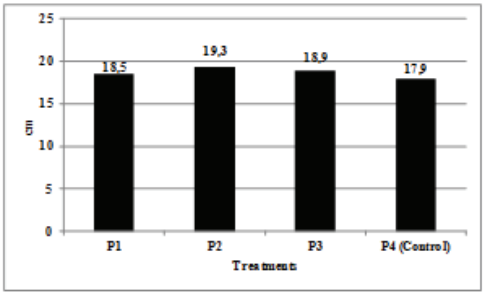

Figure 4. Total ear length

Studying the data of total ear length, we found that the lengths of later seeded, uncovered (control) treatment P4 were also statistically significantly (at p<0.01 level) lower to the sizes of the other treatments (P1, P2 and P3).
The average total ear length of the P2 treatment (earlier seeded, covered plants) was significantly higher (at p<0.01 level) compared to the other treatments. No statistically demonstrable difference was found between the ear length of the treatments P1 and P3.
From customer viewpoint depth of seeds (mm) is an important parameter and the measured average results are presented on figure 5.

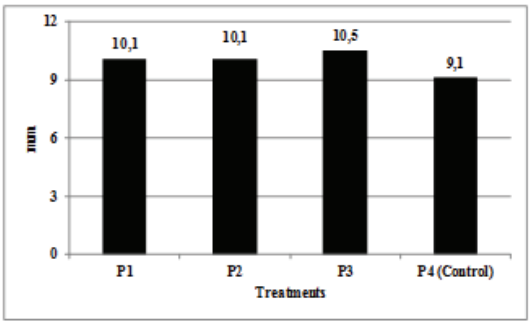

Figure 5. Depth of seeds

Analyzing the size (depth) of seeds we observed a statistically demonstrable (at p<0.01 level) difference among control treatment (P4) and other treatments. Seeds depth of later seeded, covered treatment (P3) was bigger, sustained statistically (at p<0.01 level), compared to the other treatments.

CONCLUSIONS

Effect of covering has favourable effect on highness of plants by earlier sowing time, in 2008.
Covering had also positive effect on evolution of tassels length by later sowing time.
The unhusked ear weight presented the highest results in case of treatment P2 (earlier seeded, covered). In case of later seeded treatments (P3, P4) the results were quite square.
Measuring ear length, we observed the same tendency as in case of ear weight. P2 treatment's ear produced the highest values.
From customer viewpoint important parameter, depth of seeds, the later seeded, covered treatment P3 presented the better results, in 2008.

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ORNAMENTAL PLANTS, DESIGN AND LANDSCAPE ARCHITECTURE


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