

## INVESTIGATION OF YELLOW CORN SEEDLINGS SELECTED ACCORDING TO THEIR ROOTS

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### Introduction

One of the main determinants of the productivity of yellow corn is the rate of development of its roots. The duration of the active functioning of roots is determined by the properties of the species and by environmental factors. In the early period of the development of the plant, the seed roots and primary roots take part in the nutriment supply (BERKE, 1963). Investigating the seedlings, the observable differences give information on the physiological and cultural delimitation of a single species. It was established that there is a connection between the underground parts and those above the surface. The root system of yellow corn species of moderately late and late ripening is stronger. The formation of roots is influenced by the state of development of leaves (PORTSANKO, 1959). According to other authors the state of development of the primary and secondary seed roots of grain crops is not always in proportion with the parts above the earth surface. The part of the plant above the surface may be weakly developed, having nonetheless a strong root system, but the reversed case is also possible (MUSCİK, 1965). Comparative root phenomenological investigations were carried out in inbred yellow corn lines, with considerable differences between the single lines (ANDREW, 1966). We have earlier started our experiments with seedlings of inbred lines A 111 and Ia 153, selected according to their roots.

### Materials and Methods

We have grown the three-day seedlings in hydroculture in light-thermostat. The investigations were performed on the sixth and tenth days. We have selected the six- and ten-day old plants, according the length of their roots, into long, medium and short groups. We have observed the augmentation of dry-matter content in roots and leaves, as well as the formation of the amount of total pigment content (HORVÁTH, 1965) in leaves of the seedlings with long, medium and short roots.

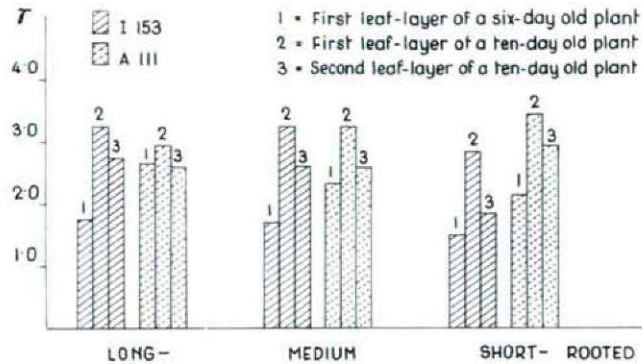
### Evaluation and discussion of results

In the graph we demonstrate the development of the total pigment content in the six- and ten-day old seedlings of lines Ia 153 and A 111. In case of the six-day old seedlings of line Ia 153 in the short-rooted ones, the pigment is

somewhat less than in those with long and medium roots. At the ten-day old plants, in the leaves of the short-rooted ones the pigment is less than in the long- and medium types. It is in the second leaf of the short-rooted ones already considerably less than in those with long and medium roots. Until the ten-day old age an increase can be observed in the pigment amount of all the three types.

In the six-day old short-rooted seedlings of line A 111 the pigment is less. In the ten-day old seedlings, in the first leaf the amount of pigment increases. And in the plants of line A 111 the augmentation is more intensive.

The pigment content of the first and second leaves shows an increase in both lines.



In Table 1 we demonstrate the formation of the dry-matter content of the two lines selected according to the root-length in the percentage of 1 g fresh weight. In both lines, the dry-matter accumulation in the first and second leaves is demonstrating the increase by cell-division and extension. The dry-matter content of the long, medium and short roots is lower than that of leaves. In the short roots the accumulation of dry matter is greater than in the case of both lines of the types with medium and long roots.

Table 1  
Formation of the percentage of dry-matter content in the seedlings of lines I 153 and A 111

Lines	Age of the plants in days	Long-			Medium-			Short-rooted		
		Root	Leaf		Root	Leaf		Root	Leaf	
			1	2		1	2		1	2
I 153	6	7,17	10,68	—	8,28	11,13	—	8,38	11,18	—
	10	7,12	10,32	11,39	7,85	10,30	11,45	8,15	10,42	11,43
A 111	6	7,99	10,91	—	8,85	11,33	—	8,24	11,53	—
	10	7,19	10,32	11,14	7,68	10,22	10,94	8,01	10,41	11,37

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