RESEARCH ABOUT ASSIMILATION SURFACE FOR SOME MAIZE HYBRIDS

CERCETĂRI PRIVIND SUPRAFAŢA DE ASIMILAŢIE A UNOR HIBRIZI DE PORUMB

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Abstract. *In 3 years of study we had in view behaviors of 10 maize hybrids for assimilation surface in soil-climatic conditions for north zone of Romanian Plain. We observed an evolution for maize leaf surface with a sigmoid curved shape. At the beginning of vegetation, leaf surface is reduced then it grow breathtaking at 35 days from risen, by forming new leaves and increasing of leaves with maximum after blossoming. After this phase of vegetation surface of leaves decreasing because leaves from inferior third of maize stem are out order.*

Rezumat. *Pe parcursul a trei ani de studiu s-a urmărit comportarea a 10 hibrizi de porumb în ceea ce priveşte suprafaţa de asimilaţie, în condiţiile pedoclimatice ale zonei de nord a Cîmpiei Române. S-a observat o evoluţie a suprafeţei foliare a porumbului de forma unei curbe sigmoide adică, suprafaţa foliară la începutul vegetaţiei este redusă, apoi aceasta creşte vertiginos la circa 35 zile de la răsărit prin formarea de noi frunze şi dezvoltarea acestora, atingând un maximum după înflorire. După această fază de vegetaţie urmează descreşterea suprafeţei foliare prin ieşirea din funcţiune a frunzelor din treimea inferioară a tulpinii de porumb.*

In agriculture, all plants must have for a long period, a big and sound assimilation surface for obtaining high yields per hectare.

There are differences at maize about the size of assimilation surface in accordance with culture conditions and with hybrids.

MATERIALS AND METHOD

We made experiments in years 2003, 2005 and 2006 in experimental field from Testing Centre for varieties Targoviste.

We made study in ten variants each of them was sowed in 4 repetitions, each repetition with 4 rows.

The 10 variants were represented by next hybrids of maize: Olt, Olimp, Campion, Milcov, Fundulea 376,Turda 165, Turda Mold 188, Turda Super, Turda 201, Turda Favorit .

The length of row was 7,5 m, distance between rows was 0.7 m resulting a plot of laud with 21 m^2 surface.

The hybrids: Olt, Olimp, Campion, Milcov, Fundulea 376 were sowed at 28 cm distance between plants on row with 50000 plants/he density, hybrids Turda 165, Turda Mold 188, Turda Super, Turda 201, Turda Favorit at 23 cm between plants an row with 60000 plants/he density.

The experiment was situated in field by method of randomized blocks with 4 repetitions.

Establishing of assimilation was made in 2 phases of vegetation for maize:

- the first in phase of 8 complete formed leave, when maize pass from vegetative stage to generative stage;
- the second in ear stage when surface of leaves is maximum without new leaves (without irrigation).

We had measure the length and breadth for all green leaves from one plant in these phases of vegetation. Determinations were made for three plants from each variant, all these were selected for represent the average for all plants from plot of land, situated in interior of rows.

The assimilations surface was established by formula:

Assimilation surface = $\frac{3xLxl}{4}$ (by Montgomery)

L = length of leaf
l = breadth of leaf

RESULTS OBTAINED

From number 1 table we observe that in year 2003 (a droughty year) were not favorable conditions for leaves growing and increasing and maximum value for ISF was at F 376 hybrid (1,88 m^2/m^2) and minimum value for ISF was at Turda 201 and Turda Favorit (0,88 m^2/m^2) at ear complete.

Table 1

Assimilation surface in the year 2003

Nr. Crt.	Hybrids	Assimilation surface (m^2), 8 leaves, 8 phase	ISF (Adequate index of leaves surface)	Assimilation surface ear phase	ISF (Adequate index of leaves surface)
1	Olt	0,172	0,86	0,331	1,65
2	Olimp	0,271	1,35	0,325	1,62
3	Campion	0,238	1,19	0,305	1,52
4	Milcov	0,248	1,24	0,286	1,43
5	F 376	0,279	1,39	0,377	1,88
6	Turda 165	0,08	0,48	0,127	1,3
7	Turda Mold 188	0,125	0,75	0,167	1,07
8	Turda super	0,125	0,75	0,22	1,3
9	Turda 201	0,145	0,87	0,146	0,88
10	Turda favorit	0,120	0,71	0,148	0,88

En 2005 the highest value for ISF was at Olimp hybrid (2,7 m^2/m^2) and the minimum value for Turda 201 hybrid (1,94 m^2/m^2).

Table 2

Assimilation surface in the year 2005

Nr. Crt.	Hybrids	Assimilation surface (m^2), 8 leaves, 8 phase	ISF (Adequate index of leaves surface)	Assimilation surface ear phase	ISF (Adequate index of leaves surface)
1	Olt	0,274	1,37	0,481	2,4
2	Olimp	0,257	1,28	0,540	2,7
3	Campion	0,229	1,14	0,509	2,54
4	Milcov	0,288	1,44	0,528	2,64
5	F 376	0,267	1,33	0,477	2,4
6	Turda 165	0,216	1,3	0,377	2,3
7	Turda Mold 188	0,167	1,0	0,412	2,47
8	Turda super	0,156	0,93	0,345	2,07
9	Turda 201	0,169	1,01	0,324	1,94
10	Turda favorit	0,144	0,86	0,410	2,46

Table 3

Assimilation surface in the year 2006

Nr. Crt.	Hybrids	Assimilation surface (m^2), 8 leaves, 8 phase	ISF (Adequate index of leaves surface)	Assimilation surface ear phase	ISF (Adequate index of leaves surface)
1	Olt	0,255	1,28	0,498	2,49
2	Olimp	0,270	1,35	0,550	2,75
3	Campion	0,222	1,11	0,500	2,5
4	Milcov	0,299	1,5	0,586	2,93
5	F 376	0,298	1,49	0,577	2,89
6	Turda 165	0,200	1,2	0,417	2,51
7	Turda Mold 188	0,177	1,07	0,445	2,67
8	Turda super	0,166	1,0	0,344	2,07
9	Turda 201	0,188	1,13	0,339	2,04
10	Turda favorit	0,144	0,86	0,422	2,54

From table 3 we observed a great uniformity for ISF values in 2006 year, exceeding in each case 2 value.

The maximum value was at Milcov hybrid (2,93 m^2/m^2) and the minimum value at Turda 201 hybrid (20,4 m^2/m^2).

From phase of 8 leaves, the rhythm of growing for leaves surface was increases by appearance of new leaves and increasing of them.

CONCLUSIONS

1. Assimilation surface shows very well the effect of all environmental factors on plant in all vegetation period.
2. Leaves surface in ear phase has an important role in forming of grains production. If this production reach an optimum level (about 3 – 4 value) maize obtain very big yields per hectare.
3. None of 3 years experiments index of leaves surface hasn't an optimum value, this one was varied in accordance with climatic conditions from studied years of study.
4. In studied conditions of culture (north zone of Romanian Plain, unirrigated, plane surface) without other intervention for adjusting of light conditions of plants, assimilation surface is dependent on environmental factors. Olimp hybrid has an amply and a relative constant leaves from one year to another, and this thing is an important premise for obtaining reach harvest.
5. In three years of study, Turda 201 hybrid presented the smallest values for index of leaves surface comparatively with others hybrids.
6. Maintaining of assimilation surface in activity for a long period is a sure way for touching of high performances at maize culture.

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