

EVALUATION OF GROWTH CHARACTERISTIC And PRODUCTION
POTENTIAL FOR EARLY MATURE OILSEED SUNFLOW

LIANG GUO ZHAN Cui Liang Ji

Liaoning Academy of Agricultural Science

Institute of Crop Breeding, 110161 Dongling Shen yang

SUMMARY

Testing results at Dong ling Shen Yang in 1990-1991 show, leaf area of early mature variety from budding to beginning flower stage grow faster than that of middle mature variety. Its growth rate and dry matter accumulation in the beginning flower stage to the physiological mature went up fast. Net assimilations rate for early mature variety (from fourth leaf to budding and budding to beginning flower) was 1.76 times and 0.71 times respectively more than that of middle mature variety. Economic coefficient was 0.34 for early mature variety, but the middle mature variety was 0.22 only. Yield difference between early mature variety and middle mature variety was not significant. Early mature variety can be taken a second crop in summer seeding and it increased economic effect at man region of China. It is necessary to research the early mature variety.

MATERIALS AND METHODS

Plot trials were conducted on the experimental field of Academy of Agricultural science in Dong Ling Shen Yang in 1990-1991. Test fields with sandy loam were broadcasted distribution by organ fertilizer in fall. The test plots that consisted of 5 rows which 10 meter long and 0.6m apart were 30 m^2 . Field experiment design used the orthogonalization trial ($L_{18} (6 \times 3^6)$). 6 oilseed varieties were used in the trial. It was 8011-10-4, 75-1, B8789, V86229, P86225 and Lz1. 3 kind of fertilization types were applied.

1. treatment was the fertilizer (120 kg/h) that was placed with seeds in the seeding time, fertilizer was not applied all growth period.
2. treatment was fertilizer (60kg/h) that was placed with seeds in the seeding time, the residual fertilizer (60kg/h) was applied one week before budding time.
3. treatment was fertilizer (120kg/h) that was applied one week before budding time, growing other period didn't fertilized.

There were three planting population in the trial:

1. 60cm x 50cm, 33,300 plant/h
2. 60cm x 40cm, 41,525 plant/h
3. 60cm x 30cm, 55,500 plant/h

phenophase was observed and recorded for all varieties during growth. Leaf area, dry matter and plot yield were measured by 10 plant among a variety at fourth leaves stage, budding, beginning flower and physiological maturity stage. The leaf area was calculated by dry leaf weight. Net assimilation rate, economic index and growth rate was calculated by basic data of mean each variety in the three treatment. the plot yield was conducted variance analysis. The other variety was normal maturity except P86225 and D8789 that was infected by disease.

RESULT

Results show that 8011-10-4, 75-1, and LK₁ belonged to a middle mature group, V86229, D8789 was a early mature group. The phenophase observed indicated that growth and development stage for the early mature group was shorter than that of the middle mature group. A daynumber of each growth and development stage was difference between the early and middle mature varieties

Table 2

→ The days of growth and development stage every variety

	emergence to budding (days)	budding to flower (days)	flower to physiological (days)	days of growth (days)
8011-10-4	42	20	29	91
75-1	41	22	28	91
LK ₁	45	20	27	92
D8789	37	22	28	87
V86229	33	21	31	85

The day number of budding to beginning flower and beginning flower to physiologic maturity was similar between the early mature group and the middle mature group, however the growth days of emergence to budding were difference. This stage determined a day number of growth variation between the early mature group and the middle mature group.

leaf number, plant height, leaf area and dry matter weight which was found that basic level of the middle mature group was higher than the early mature group. The leaf number was 30 for the middle mature group, but it was about 24 for the early mature group. The plant height was 2m for the middle mature group and it was 1.4-1.6m

Net assimilation rate was $4.03g/m^2.d.$ from the fourth leaves to the budding and it was $3.53g/m^2.d.$ from the budding to the beginning flower for the early mature group. Net assimilation rate was $1.46g/m^2.d.$ from the fourth leaf to the budding, it was $2.07g/m^2.d.$ from the budding to the beginning flower for the middle mature group. This shows that use of light energy is more effective in the early mature variety than in the middle mature variety. Economic coefficient was 0.34 for the early mature group and it was 0.24 for the middle mature group. It was higher in the early mature variety than in the middle mature variety.

The yield was conducted a variance analysis. Results show that variation of yield between the early mature variety and the middle mature variety was not significant.

Table 6 compare with yield variation every variety

	unit:kg					
k4 (V86229)	3.33					
k1 (8011-10-4)	4.75	0.58				
k2 (75-1)	4.74	0.59	0.01			
k6 (LK1)	4.60	0.73	0.15	0.94		
k5 (p86225)	2.99	2.34**	1.76**	1.75**	1.61**	
k3 (D8789)	2.61	2.72**	2.14**	2.13**	1.99**	0.38

* 5% significant level
 * 1% significant level

CONCLUSIONS

There are great difference at characteristic of growth for the different variety of mature phase in sunflower. Basic level at plant height, leaf area size, leaf number was lower in the early mature variety than in middle mature variety, but net assimilation rate and economic coefficient in the early mature variety was higher than that in the middle mature variety. The yield difference between the early mature variety and the middle mature variety was not significant. The early mature varieties may be take a second crop and was planted in summer. It can increase an oil content of seeds and economic effect at the planting region.