EFFECT OF VEGETATIVE ORGANS REMOVAL ON GROWTH AND YIELD OF DIFFERENT WINTER RAPE TYPES

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Rape overwintering in the climate of Poland is one of the most important factors affecting a successful crop. After a severe winter, part of the plantation must be ploughed down for most of the plants being destroyed by frost. There are sometimes winters, however, during which the plants are not frozen to death, but their lateral leaves and growing point are destroyed. Such plants are considerably weakened, they take time to regenerate their leaves or even form their new stems from lateral buds, which hampers their growth and decreases the yield.

In order to find out how the growth and yield of different rape varieties may respond to a removal of their vegetative organs, eight field experiments were carried out in the years 1985-86 in three regions of Poland: the north-eastern / Agricultural Technical Academy, Olsztyn /, the central / Experimental Stations of the Institute of Soil Science and Plant Cultivation, Wielichowo-Zielęcin and Błonie Topola / and the south-western / Agricultural Academy, Wrocław /. The experimentas are being carried on.

The scheme of the experiments was as follows:

I factor - removal of vegetative organs

a/ controls

b/lateral leaves removed
c/ lateral leaves and growing points removed

II factor - varieties

1/ Górczański	high erucic
2/ Tomek	high erucic
3/ Jet Neuf	low erucic
4/ G-22	low erucic
5/ Beryl	low erucic
6/ Jantar	double low

Experiment design was split plots in four replications. The leaves removed just before the onset of spring vegetation, that is when the mean day temperature was above $5^{\circ}C$ for five successive days.

To evaluate the regenerative ability of the rape varieties studied, every 10 days for 40 successive days
- dry mass of the above ground parts of the plants was weighed
- height of the plants was measured
- number of leaves on a plant was counted

The last evaluation was made at the onset of flowering. On harvesting the ripe plants
- seed yield
- 1000 seed weight
- oil and protein contents in seeds

were determined.

The results obtained were similar in all the experiments. Nor were any essential differences observed in the reaction of varieties studied to the removal of their vegetative organs. Therefore the mean data from 8 experiments with only 3 out of 6 varieties under study will be presented, namely:
- Jet Neuf - having the highest yield
- G-22 - having the smallest decrease in yield due to the removal of vegetative organs
- Jantar - as double low being now put into production.

The tables show the differences in per cent, as compared

to the controls, for the 3 above varieties and for the mean data of all the 6 varieties.

As the time proceeded, the differences in dry mass between the controls and the plants experimentally damaged decreased. In G-22 they were less significant than in the other varieties, especially at the first two determinations / Table 1 /.

Dry mass
/ in %% of control/ Table 1

Number of days after treatment	Variety	Removal of	
		lateral leaves	all leaves and growing point
10	Jet Neuf	37	19
	G-22	39	19
	Jantar	29	22
	M e a n	35	19
20	Jet Neuf	45	23
	G-22	56	24
	Jantar	49	22
	M e a n	50	22
30	Jet Neuf	64	31
	G-22	66	36
	Jantar	67	31
	M e a n	64	30
40	Jet Neuf	74	46
	G-22	71	41
	Jantar	84	48
	M e a n	76	40

At the first determination the plants with lateral leaves removed had 86-90% and at the last one 87-91% of the heigh of controls. The plants with lateral leaves and growing points removed were much lower and had, respectively, 32-36% and 48-64% of the height of controls / Table 2 /.

Plant height Table 2
/ in % of control /

Number of days after treatment	Variety	Removal of	
		lateral leaves	all leaves and growing point
10	Jet Neuf	80	32
	G-22	91	36
	Jantar	84	34
	M e a n	82	33
20	Jet Neuf	74	26
	G-22	81	32
	Jantar	99	27
	M e a n	80	27
30	Jet Neuf	82	39
	G-22	89	40
	Jantar	84	39
	M e a n	82	38
40	Jet Neuf	91	65
	G-22	87	59
	Jantar	89	48
	M e a n	87	57

The plants restored the removed leaves quickly. As early as at the first determination, comparing to the controls, the number of lateral leaves restored was in Jet Neuf 80%, G-22 - 74% and Jantar - 82% and after removal of lateral leaves and growing points, 59%, 51% and 58%, respectively. With time those differences decreased and at last determination at the onset of flowering they were 5-9% in the case of lateral leaves and 14-21% in the case of lateral leaves and growing points removed / Table 3 /.

Number of leaves
/ in % of control /

Table 3

Number of days after treatment	Variety	Removal of	
		lateral leaves	all leaves and growing point
10	Jet Neuf	80	59
	G-22	74	51
	Jantar	82	58
	M e a n	74	54
20	Jet Neuf	78	69
	G-22	78	71
	Jantar	79	72
	M e a n	77	70
30	Jet Neuf	92	71
	G-22	86	74
	Jantar	87	74
	M e a n	86	74
40	Jet Neuf	92	86
	G-22	91	81
	Jantar	95	79
	M e a n	92	80

The year of 1986 was more favourable for the growth and yield of rape than of 1985. Control yields in 1985 were 3.28-4.07 t/ha and in 1986 - 3.60-4.87 t/ha. The decrease in yield due to lateral leaves being removes was 3-9% in 1986 and 8-17% in 1985 and that due to lateral leaves and growing points being removed were 17-30% in 1985 and 14-24% in 1986. The yield of G-22 was the lowest in either year and that of Jet Neuf in 1985 and of Górczański and Tomek in 1986 was highest. The lesser decrease in the yield of G-22 due to the removal of ve-

getative organs resulted in that the difference in yields between Jet Neuf and G-22 controls was 19% in 1985 and 16% in 1986. In plants with lateral leaves and growing points removed that difference was only 4% in 1986 and 10% in 1985 / Table 4 /.

Seed yield in 1985 and 1986 / in %% of control / Table 4

Variety	Removal of			
	lateral leaves		all leaves and growing point	
	1985	1986	1985	1986
Górczański	87	93	76	76
Tomek	90	91	80	77
Jet Neuf	83	94	70	80
Beryl	90	96	75	83
G-22	92	97	83	86
Jantar	90	93	75	83