THE COMPARISON OF SPRING AND WINTER OIL-SEED RAPE PHOTOSYNTHESIS RATE AGAINST A BACKGROUND OF THE INCREASE OF DRY MATTER IN THE PLANT

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Photosynthesis is one of the major factors of plant biomass production. The proper course of this fundamental process during the vegetation period, conditioned by many environment factors secures high yield. For this reason the knowledge of the course of photosynthesis intensity during the plant growth is necessary. Specific climate of north-west part of the country, witch is the seedrape basin was the additional argument for undertaking this study.

Spring seedrape has one photosyntheticaly active period i.e. spring-summer and winter seedrape has two periods: autumn and spring-summer. One can suppose that the condition of plants enterning the winter pau. depends considerably on the intensity of photosynthesis in the autumn and the yield of plant on the intensity of photosynthesis during spring-summer period.

This subject was studied by Brar at all /1978/; Brar, Thies /1977/; Dhalival, Malik /1982/; Clarke, McCaig /1982/; Inanaga, Kumura /1974/; Inanaga at all /1980/ and Dmochow-

ski, Duczmal /1965/; Gwizdek, Seidler /1979/ with corn.

In this paper are presented results of field experiments with spring seedrape cultivar Mazowiecki and winter seedrape cultivar Górczański from the years 1981-85. The data concern spring-summer vegetation.

Methodes of the experiment

Plants were sampled randomly from the field and photosynthesis rate was estimated on the gas analizer Infralyt--4 in the open system with three-duct swich. Ear speed in the chambers and analizer was 40l/h.

Petioles of sampeld leaves of seedrape as well as stems and pods were put with the lower and into the small containers with water and then into cylindric assymilation chamber with water jacet at 20°C and lighted with 400W mercury-mirrored lamp. Light intensity outside the chamber was about 40 000 lux's. This intensity was estimated according to light curve as best for the seedrape.

Photosynthesis rate was determined for all present above-ground parts of plant in the following growth stages:

1. rossete
2. stem formation
3. inflorescens
4. flowering
5. early pods development
6. pods filling

At the same time the weight of dry mass was determined.

Results

Obtaind results are shown on figures 1 and 2. Comparing

the data one can say that the photosynthesis in term of unit of whole above-ground part has different values and direction of changes for winter and spring seedrape.

For spring seedrape the intensity of this process decrease with vegetation, but for winter form stays at close level and drops in values not until pods filling.

As figures show spring seedrape assymilates more intensly in the early growth stages /I-III/ than winter form and it equals for both form at pods filling stage.

The accumulation of above-ground biomass was also different for spring and winter seedrape. It was similar for both forms up to flowering and beginning from early pod development up to the end of vegetation this process was more intens for winter seedrape and for spring seedrape the biomass development was poorer and finished in the pods filling stage.

Abstract

Measurements of the photosynthesis intensity in succeeding growth stages during spring and summer vegetation have shown that spring and winter oil-seed rape have different direction of changes in this process expressed per dry weight unit of the all above-ground part of the plant.

When the spring form has revealed continuous decline of this process the winter form has shown similar photosynthesis intensity beginning from the stem forming through flowering up to the early pod development.

The intensity of photosynthesis during the vegetation was mainly affected by leaves and after their falling off, stems and pods. The rate of the dry mass increase was

higher for winter then spring oil-seed rape and constant to the end of the vegetation.

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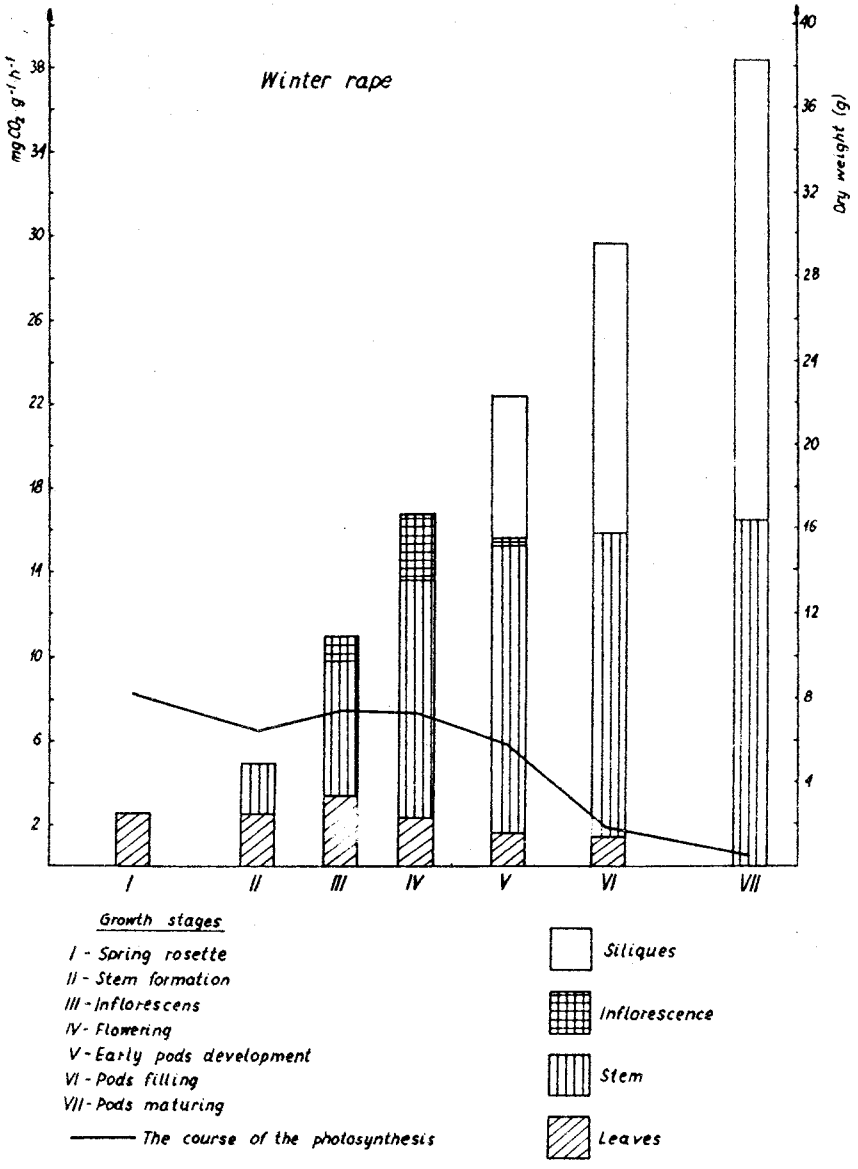

Fig. 1 Photosynthesis rate of plant against a background of accumulation of dry matter in the particular organs

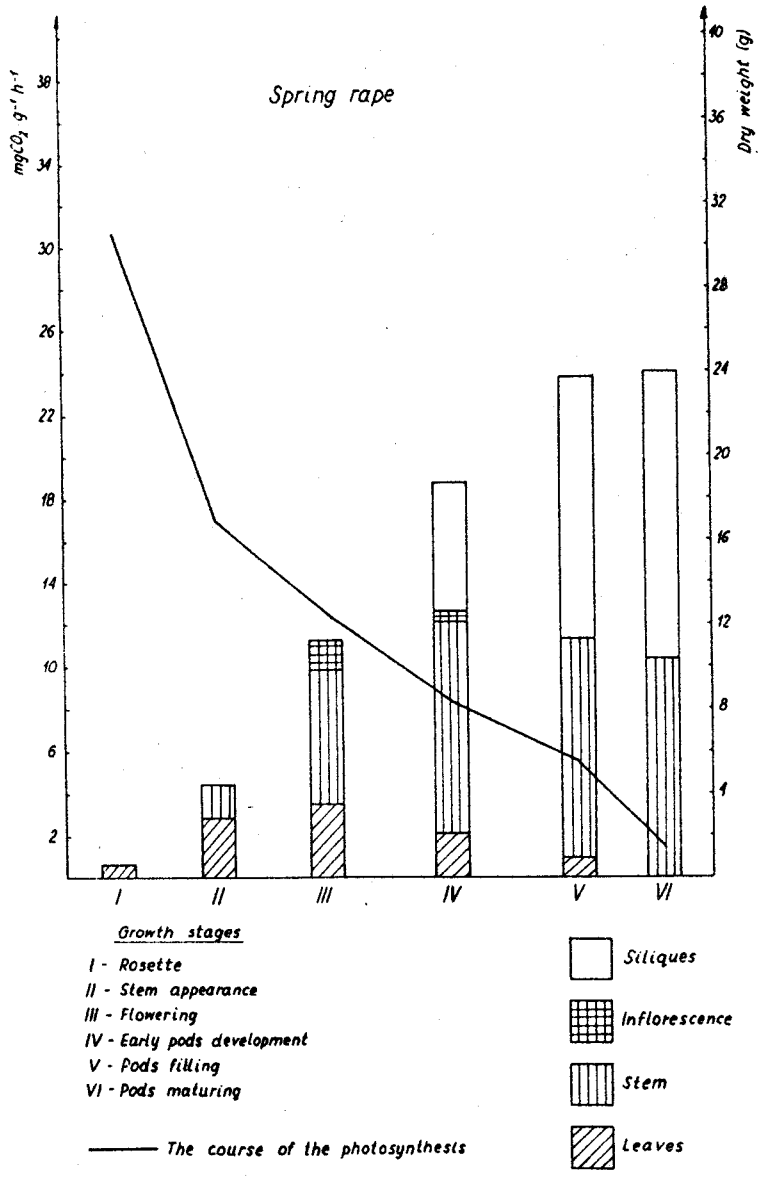

Fig.2 Photosynthesis rate of plant against a background of accumulation of dry matter in the particular organs