RESEARCH REGARDING THE INFLUENCE OF DIFFERENT FUNGICIDE TREATMENTS UPON THE FOLIAR SUFACE INTEX (LAI) TO THE OILSEED RAPE

Daniel GROSZ, Valeriu TABARA, Dacian LALESCU

Banat's University of Agricultural Sciences and Veterinary Medicine, Faculty of Agricultural Sciences, Timisoara, Aradului Street, no. 119, RO-300645, Romania,
Corresponding author: dadrtm_grosz_daniel@yahoo.com

Abstract: *The paper aims to identify the main fungal substances used to combat canola diseases and the influence of those on metabolism, generative processes, physiological actions that bring production increases of canola. There have been realized studies regarding fungal active substances, the moment of applying and the way that these influence the productions nature and the percentage of oil in canola seeds. Were carried out researches in the field, being realized biometric measurements, index of leaf surface measurements (LAI - Leaf Area Index) with device LI 3000C Portable Area Meter, laboratory tests regarding (MMB (g), humidity (%) and the percentage of oil (were realized with FOSS Infratec device 124). In the experimental field were made test towards the plants height variation, the ramification degree variation, the variation of the siliqua on plant number, the variation of the seeds in siliqua number, the seeds production. The observations realised in the experimental field brought at surface an uniform bloom inside of the variants in which have been applicated fungual treatments with strobilurine, plants with a present foliage and on the inferior levels of the plant that participate at the photosynthesis process through the increase of the plant photosynthetic capacity.The treatments with strobilurin were applied in stage 51-59 BBCH, being observed increases of the leafs surface resulting a bigger photosynthetic capacity, what does influence directly the process of assimilation and grains filling. The researches have been realised in the West side of Romania, Timis county, through experiences in strips established in the field, being realised observations at level of plant with three plant protection. The calculation of the harvest data were made according to the arrangement method of the experiments in the field, and the results of the tests from vegetation regarding the plants height, the ramification degree and the number of siliqua/plant were calculated through the analyse of the statistic variations line. From seeds production point of view were obtained production increases on average with 973 kg/he in the variants in that were used two fungicides in plant protection, one with strobilurin, compared with untreated variant. That confirms the direct influence of those substances on metabolism, vegetative and generative processes of canola.*

Key words: *strobilurins, Leaf Area Index, production, canola.*

INTRODUCTION

There have been realised studies regarding fungual active substances, the moment of applying and the way that these influence the productions nature and the percentage of oil in canola seeds. The researches had as purpose the fungual treatments influence on production and canola oil quality for biodiesel.

The researches have been realised in the West side of Romania, Timis county, through experiences in strips established in the field, being realised observations at level of plant with two plant protection, one with single application of tebuconazol ingredient active and the second with two applications (tebuconazol and fungicides with strobilurin,).

Have been established optimised fungual treatments for canola culture protection, being used and strobilurin in the treatments like: picoxistrobin, azoxistrobin and dimoxistrobin, active substances homologated in Romania, for canola culture protection.

MATERIAL AND METHOD

The used breed in the researches was: Extorm, seed treated with Cruiser OSR, assuring a density at seedling of 500000 pl/he. The settlement method of the experience during the experimental cycle was in strips with three repetitions. The basic fertilisation: complex fertilisers 250kg/ha 20:20:0, was realised before the soil preparation, and nitrogen fertilisation-200 kg/he ammonium nitrate, and then Kelpac+Brasitrel foliar fertilisation application in the spring.

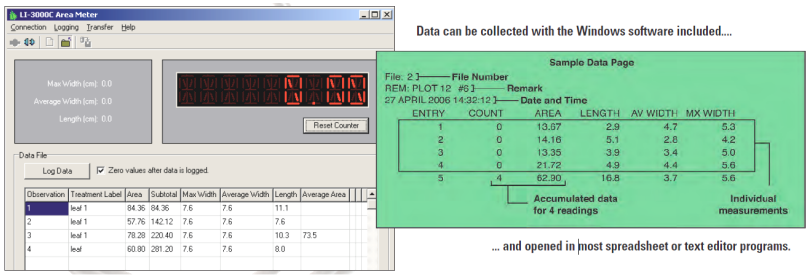
The soil base work was plowing on 1.08. – at 25 cm depth, then discussion, roller the soil.

Pest control was realised by applying insecticides treatments with tiacloprid 240 g/l - 0,3l/he - (Meligethes aeneus) and tiacloprid 100 g/l +deltametrin 10 g/l - 0,6 l/he - (Brevicoryne brassicae, Meligethes aeneus, Psylliodes chrysocephala).

Diseases control was realised in the spring applying tebuconazol 250 g/l- 0,5 l/he for Phoma lingam, having even growth regulator role, and then four variant with protioconazol 80 g/l+tebuconazol 160 g/l - 1l/he, treatment fungual products with strobilurin for Sclerotinium sclerotiorum, Botrytis cinerea, Alternaria brassicae and Erysiphe communis plus green leaf effect.

In the experimental field was realised biometrical measurements regarding the plants height variation, ramification degree variation, the variation of the number of pods, seeds production and the foliar surface index (LAI-Leaf Area Index) with device LI-3000C Portable Area Meter.

The interface software allows the user to monitor data on a computer and store readings in a log file. Real time Capture Mode, initiated from the LI-3000C console, transmits data directly to the computer.



Determinations are realised on variants, the samples have been recolted from all 3 repetitions at each variant level. We studied four variants with fungual treatment plan.

A length encoding cord, with one end held against a stationary object, is drawn out of the scanning head as the head is moved over the leaf. The LEDs are sequentially pulsed once for each 1 mm of cord travel. For example, if a 20 mm width x 100 mm length object is measured, 20 LEDs will be masked for 100 scanning cycles, resulting in a display of 20.00 cm2. Accuracy is unaffected by the scanning speed (1 meter s-1 maximum rate).

The research methodology have been realised according to standards (EPPO) European and Mediterranean Plant Protection Organization, recognised at intern and international level.

Statistical analyses have been performed by STATISTICA 8 package. Duncan's procedure is one of the most popular of the post hoc procedures. Complex comparisons involve contrasts of more than two means at a time.

RESULTS AND DISCUSSION

We know the fact that LAI is a measure of the upper surface area of leaves per unit of ground surface. An LAI of 4 is 4 m^2 of leaf surface area per m^2 of ground surface. B. napus plants usually develop more and larger leaves and have a higher LAI. An LAI of about four is required for the crop canopy to intercept about 90% of the incoming solar radiation. The larger the leaf area the crop can expose to the sun, the more dry matter the crop can produce per day). The more dry matter, the higher the potential yield.

Researchers report that the maximum LAI for B. napus is between 3 and 6 while B. rapa averages 3.5. Leaves initially are the most important photosynthetic plant structure for fixing food for plant growth. The LAI of canola starts to decrease shortly after first flower. (Freyman, S at all. 1973; Morrison at all. 1992). (fig. 1.)

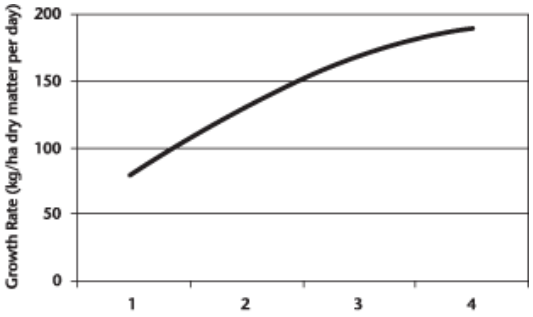


Figure 1. Relationship Between LAI and Crop Growth Rate
(Freyman, S at all. 1973; Morrison at all. 1992).

After the researches and determinations realised on foliar surface index (LAI – Leaf Area Index), according to experimental variants can be seen the fact that experimental variants in which have been applicated fungual tratments with strobilurine LAI have registered values between 3.5 and 4, assuring like this a photosynthetic capacity that is superior to standard variant in which LAI was equal to 1,6 (Table 1/fig.2.).

The Duncan's test for the post-hoc comparisons was performed for Leaf Area Index in order to find the statistical differences between the studied fungual tratments (See tab.1.).

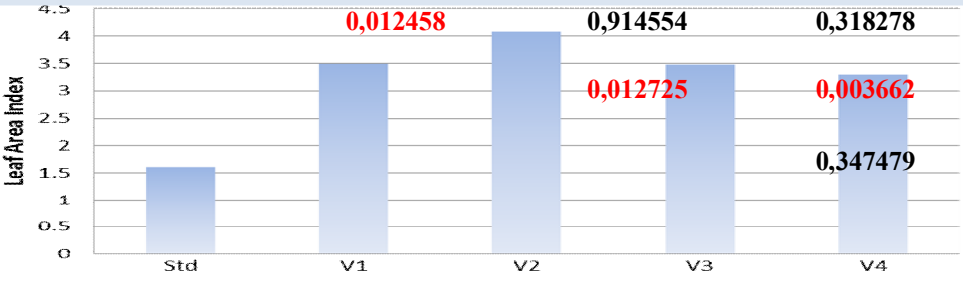
The observations realised in the experimental field brought at surface an uniform bloom inside of the variants in which have been applicated fungual treatments with strobilurine, plants with a present foliage and on the inferior levels of the plant that participate at the photosynthesis process through the increase of the plant photosynthetic capacity.

To compare the leaf area index of oil seed rapes under different fungicides treatments in conditions of year 2012, we used Duncan test for multiple comparations (ANOVA).

Figure nr. 2./*Table 1.*

Duncan test for multiple comparations between the fungicides treatments variants for the total leaf area obtained in year 2012.

Var1	{1} - 3,5000	{2} - 4,0800	{3} - 3,4800	{4} - 3,3000
V1		0,012458	0,914554	0,318278
V2			0,012725	0,003662
V3				0,347479
V4				



From tabel 1 we can observe that we have significant statistic differences ($p<0,05$) between variant 1 (T1- tebuconazol 250 g/l – 0,5l/ha/BBCH 14-18; T2- picoxistrobin 200 g/l + ciproconazol 80 g/l -0,6 l/ha/BBCH 51-52) and variant 2 (T1- tebuconazol 250 g/l – 0,5l/ha/BBCH 14-18; T2- dimoxistrobin 200 g/l + boscalid 200 g/l) -0,5 l/ha/BBCH 51-52).

Significant statistic differences ($p<0,05$) was obtained also between variant 2 (T1- tebuconazol 250 g/l – 0,5l/ha/BBCH 14-18; T2- dimoxistrobin 200 g/l + boscalid 200 g/l) -0,5 l/ha/BBCH 51-52) and variant 3 ((T1- tebuconazol 250 g/l – 0,5l/ha/BBCH 14-18; T2- (azoxistrobin 200 g/l +ciproconazol 80 g/l)- 0,75l/ha/BBCH 51-52).

Distinct significant statistic differences ($p<0,01$) was obtained between variant 2 (T1- tebuconazol 250 g/l – 0,5l/ha/BBCH 14-18; T2- dimoxistrobin 200 g/l + boscalid 200 g/l) -0,5 l/ha/BBCH 51-52) and variant 4 (T1- tebuconazol 250 g/l – 0,5l/ha/BBCH 14-18; T2- (protioconazol 80 g/l +tebuconazol 160 g/l)- 1l/ha/BBCH 51-52).

To compare the oil percentage of oil seed rapes under different fungicides treatments in conditions of year 2012, we used Duncan test for multiple comparations (ANOVA).

Table 2.

Duncan test for multiple comparations between the fungicides treatments variants for the total oil percentage of oil seed rapes obtained in year 2012.

Var1	{1} - 47,733	{2} - 47,267	{3} - 48,367	{4} - 47,000
V1		0,834942	0,777580	0,753690
V2			0,639110	0,905196
V3				0,567770
V4				

From table 2 we can observ that although there are differences between variant the oil percentage of oil seed rapes, these differences are not statistically certified.

ACKNOWLEDGMENTS

This work was published during the project "POSTDOCTORAL SCHOOL OF AGRICULTURE AND VETERINARY MEDICINE", POSDRU/89/1.5/S/62371, co-financed by the European Social Fund through the Sectorial Operational Programme for the Human Resources Development 2007-2013.

CONCLUSIONS

The observations realised in the experimental field brought at surface an uniform bloom inside of the variants in which have been applicated fungual treatments with strobilurine, plants with a present foliage and on the inferior levels of the plant that participate at the photosynthesis process through the increase of the plant photosynthetic capacity.

Regarding the Leaf Area Index we observed that, has been obtained the good results from all the experimental variants with two ingredient active.

To compare crop production rapes under different fungicides treatments in conditions of year 2012, the results has been obtained increases in the variants in that were used fungicide treatments with strobilurin, what confirms the direct influence of those substances on metabolism, vegetative and generative processes of canola.

BIBLIOGRAPHY

1.BILTEANU HH, 2001 – Fitotehnie, vol. 2 Ed. Ceres, Bucureşti, P. 90-108.

2.FREYMAN, S., CHARNETSKI, W.A. AND CROOKSTON, R.K. 1973. Role of leaves in the formation of seed in rape. Can. J. Plant Sci. 53:693-694.

3.GROSZ DANIEL, BORCEAN IOAN, 2009 - Proceedings, UASVM Bucharest, Series A, Vol. LII, 2009, ISSN 1222-5339.

4.HĂLMĂJAN, H.V., R. CÎLȚEA, 2005 - Puncte de vedere privind elemente thenologice la cultura rapiței; fertilizarea în vegetație. Agricultorul român nr. 3:13-14.

5.MORRISON, M.J., STEWART, D.W. AND MCVETTY, P.B.E. 1992. Maximum area, expansion rate and duration of summer rape leaves. Can. J. Plant Sci. 72:117-126. http://www.canolacouncil.org/chapter3.aspx.

6.TABATA VALERIU., 2005 - Fitotehnie Voi. I Plante tehnice oleaginoase şi textile. Editura Brumar.