RESEARCH REGARDING COMPETITION IN PURE AND MIXED CULTURE *BROMUS INERMIS* AND *ONOBRYCHIS VICIIFOLIA*

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Abstract

B. inermis and *O. viciifolia* were sown in pure and mixed culture in altern rows spaced at 12,5 and 25 cm. DM yields were recorded on each row and competition and proto-cooperation indices were calculated. The negative values of competition indices and the poyitive value of proto-cooperation indices help the evaluation of these phenomena in grasses and legumes swards.

Key words: competition, proto-cooperation, pure culture, mixed culture

INTRODUCTION

The vegetal cover of grass is established a multitude of interrelationships between individuals of the same species both between individuals and species other , the competition and the most important protocooperation . From agronomic stands competition for natural resources , namely , water, light , space and food (macro and micronutrients) .In pratologie knowledge of these interrelationships are of particular importance for natural or sown grassland management , the subject of many studies (Carlier, L.,and al,2006, Hera, C.,and al,2001, Maruşca, T., 2001 , Puia I.and al, 1988, Rotar I.,1993) On this theme fall and our research in recent years.

MATERIAL AND METHOD

Experience the type 3X3x2 factor species following graduations : a1 - brome (*Bromus inermis*) , a2 - sainfoin (*Onobrychis viciifolia*) a3 - sainfoin (*Onobrychis viciifolia*) + obsiga (*Bromus inermis*) and factor B with the graduations : b1 - No , b2 - N_{100} , b3 - N_{200} . The soil is relatively well stocked in phosphorus and potassium, nitrogen MidLSDe stocked . Harvested area of a parcel was 20 m^2 and collection and sampling was done at both the plot (production expressed in t / ha) and the ranks of sainfoin and brome are expressed in grams per meter (g / m).

RESULTS AND DISSCUSIONS

The overlapping ecological niches of different species results in common use resource or resources. This leads to establish the species an

ecosystem of a variety of high trophic relationships, but nevertheless may be reduced to a few basic groups competition, predator-prey relationships, parasitism, commensalism and symbiosis. In this paper we present the interrelations established between the individuals constituting a population of plants, individuals exhibiting different needs for natural resources .In this context we will discuss intraspecific competition and interspecific.

Intraspecific competition is a consequence of mass effect and occurs between individuals the same species for space, minerals, light and water. As the effect of mass intraspecific competition is regulated by homeostatic mechanisms or by human intervention, pointing out that individuals can maintain a stronger species. (Puia I.and al, 1988, Rotar I.,1993)

If one of interspecific competition can become dominant species, eliminating the other or forming a mixture with other species according to the power of each . Intraspecific competition is more intense than interspecific competition. This is clear from the data in Table 1 and 2. As harvest meter performed at a row of beekeeping sown between two rows of brome is higher at all doses of fertilizer used per meter than that achieved on a row between two rows of beekeeping and beekeeping . This fact supports the statement made earlier on greater intensity of intraspecific competition against interspecific competition .

In the case of our mixture brome row which is in the neighborhood of rows of beekeeping , provides a yield of greater than brome SU in pure culture (Table 2) .

Table 1

Mean of DM yield (g / m) obtained from pure cultures and *Bromus inermis* + *Onobrychis viciifolia* passing away 12,5 cm between rows

Factor b – nitrogen doses	Factor a – type of culture	Mean of DM g/m	Difference	%	Signifi cance
$b_1 – N_0$	*Bromus inermis*	196.50	0.00	100.00	-
b_2 - N_{100}		313.50	117.00	159.54	x
$b_3 – N_{200}$		500.50	304.00	254.70	xxx
$b_1 – N_0$	*Onobrychis viciifolia*	356.00	0.00	100.00	-
b_2 - N_{100}		497.50	141.50	139.74	x
$b_3 – N_{200}$		623.00	267.00	175.00	xx
$b_1 – N_0$	*Bromus inermis* + *Onobrychis viciifolia*	547.00	0.00	100.00	-
b_2 - N_{100}		510.0	-37.00	74.95	0
$b_3 – N_{200}$		572.50	25.55	104.66	-

LSD5% = 16,50 for *O. viicifolia* + *B. inermis* in mixed culture
LSD5%= 16,50 for *B. inermis* in pure culture
LSD5%=21,00 for *O. viciifolia* in pure culture

If associated crop harvest is done DM higher than pure cultures of *O. viciifolia*. This fact *B.inermis* and can be explained by enriching soil nitrogen through fixation by symbiotic beekeeping , part of it being used for grasses . Relationship between composition and nitrogen transfer is not

constant over time ; it changes with the growth of plants . For the quantitative expression of these interrelations we proceeded to calculate indices of competition (IC) and indices protocooperare (IP) . Formula then worked in calculating the indices of competition for associated crops are:

$$I_C = \frac{R_1 - R_2}{R_2} \times 100$$

In the : R1 – Mean of DM yield to a meter (g / m) to *B. inermis* or *O. viciifolia* sown in alternate rows in associated culture ;

R2 – Mean of DM to a meter (g / m) in *B.inermis* or *O. viciifolia* sown in pure culture at double distance between rows .

Table 2.

Mean of DM yield (g / m) obtained from pure cultures and Bromus inermis + Onobrychis viciifolia passing away double sown between rows (25cm)

Factor b – nitrogen doses	Factor a – type of culture	Mean of DM g/m	Difference	%	Significance
$b_1 – N_0$	*Bromus inermis*	307.50	0.00	100.00	-
b_2 - N_{100}		333.00	25.50	108.29	-
$b_3 – N_{200}$		473.50	166.00	153.98	xx
$b_1 – N_0$	*Onobrychis viciifolia*	679.50	0.00	100.00	-
b_2 - N_{100}		697.50	18.00	102.64	-
$a_3 – N_{200}$		738.50	59.00	108.68	-
$b_1 – N_0$	*Bromus inermis* + *Onobrychis viciifolia*	615.55	0.00	100.00	-
b_2 - N_{100}		632.00	16.00	102.67	-
$b_3 – N_{200}$		816.00	200.00	132.56	xxx

LSD5% = 18,50 for *O. viicifolia* + *B. inermis* in mixed culture
LSD5%= 21,00 for *B. inermis* in pure culture
LSD5%=23,70 for *O. viciifolia* in pure culture

Proto-cooperation indices were calculated using the formula :

$$I_{PC} = \frac{R_1 - R_p}{R_p} \times 100$$

In the R_1 - the average yield of SU to a meter (g / m) to B. *inermis* or *O. viciifolia* alternated rows in associated culture ;

Rp - the average yield of SU to a meter (g / m) in *B.inermis* or *O. viciifolia* sown in pure culture at the same distance between rows .

Table 3.

Competition indices at *B.inermis* and *O. viciifolia* sown in pure cultures and in mixed cultures, in alterns rows

Interval between rows (cm)	Type of culture	Competition N_0	Indices N_{100}	(Ic) N_{200}
12,5 cm	*B.inermis* pure culture (PC)	- 0.40	- 0.31	-0.25
	B.inermis mixed culture (MC)	2.8	-0.72	8.0
25.0 cm	*B.inermis* pure culture (PC)	-0.43	-0.39	-0.47
	B.inermis mixed culture (MC)	1.60	3.0	-7.5
12.5 cm	*O.viciifolia* pure culture (PC)	- 0.40	- 0.31	-0.25
	O.viciifolia mixed culture (MC)	2.8	-0.72	8.0
25.0 cm	*O.viciifolia* pure culture (PC)	-0.43	-0.39	-0.47
	O.viciifolia mixed culture (MC)	1.60	3.0	-7.5

Competitive indices (Table 3) *B. inermis* indicates negative (but three variants fertilized with nitrogen) ; *O. viciifolia* these indices are negative . In populations where there is competition phenomena , indications of positive negative. Competing values when events occur signifies lack of competition or other masking their co-action . Proto-cooperation crops associated indices have positive values signifying the frequency of their size proto-cooperation . These results underline once associated crop productivity of perennial grasses and legumes to cultures pure of O.viciifolia proto-cooperation clearing is done in a lesser extent.

Table 4.

Protocooperation indices at *B.inermis* and *O. viciifolia* sown in mixed cultures, in alterns rows

Interval between rows (cm)	Type of culture	Protocooperation N_0	Indices N_{100}	(Ic) N_{200}
12,5 cm	*B.inermis*	178.37	62.67	14.38
25.0 cm	*B.inermis*	100.17	89.78	72.33
12,5 cm	*O.viciifolia*	53.65	2.51	8.10
25,0 cm	*O.viciifolia*	9.41	9.39	10.49

CONCLUSIONS

The index values of competition for space - where competition occurs - negative, the higher the more competition is stronger. Positive values indicate the absence of competition for space Ic rather mask them by other co-action .

Proto -cooperation CPI index values associated crops grasses and legumes are usually positive ; the greater the higher means a more marked protocooperation .

REFERENCES

1. Carlier, L., Rotar, I., Vidican Roxana, Razec, I., 2006 , Manualul sistemelorde producţie ecologică, Ed. Risoprint, Cluj Napoca
2. Hera, C., Schiopu, D., 2001, Cercetarea ştiinţifică şi agricultura durabilă**,**Ed. Agris – Redacţia Revistelor Agricole, Bucureşti
3. Maruşca, T., 2001, Elemente de gradientică şi ecologie montană, Ed.Universităţii Transilvania, Braşov;
4. Puia, I.,Erdelyi, Şt., Aurelia, Moldovan, Rotar, I.,1988, Cercetări asupra factorilor care influenţează producţiile de azot în culture pure de Dactylis glomerata şi Medicago sativa şi în amestecurile dintre ele, Lucrări ştiinţifice ale ICPCP Măgurele-Braşov, vol. XIV,
5. Rotar,I., 1993, Cercetări privind coacţiile de competiţie în culturi pure şi asociate de Medicago sativa şi Dactylis glomerata în condiţii de fertilizare diferenţiată cu azot. USAMV Cluj-Napoca.