INSTITUTUM AGRONOMICUM "DR.PETRU GROZA" CLUJ-NAPOCA /ROMANIA/
NOTULAE BOTANICAE HORTI AGROBOTANICI 1979, X.

THE EFFECT OF FERTILIZATION AND AMENDMENT UPON THE WEEDING OF WHEAT

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Abstract:

GUŞ P., BUCUR M., 1979, The effect of fertilization and amendment upon the weeding of wheat Not.Bot.Hort.Agrobot. Cluj, 1979, X, 115-120. Chemical and organic fertilization favours the weeding of the wheat culture, increasing the number of annual weeds in the first year. The liming, does not have similar effects in our experiments on argillic Brown Forest soil and on Grey Brown Podzolic Pseudogleyed soil.

Index words: Fertilization, liming, weeding .

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Material and method

The establishing of the effect of fertilization and amendment upon the weeding of wheat culture was made in stationary experiment organized on a Grey Brown Podzolic pseudogleyed soil and an argillic Brown Forest soil (truncated 2) (tab.1,2) Each experiment on a surface of 10,000 m^2 was situated after the blach method, in 4 repetitions and 5 variants (V_1 - without fertilizer; V_2 - $N_{50}P_{40}$; V_3 - $N_{100}P_{80}$; V_4 - $N_{100}P_{80}K_{80}$; V_5 - natural organic manure, 25 t/ha applied to the last year's plant). The used cultivar was Triticum aestivum Dacia; in the previous year maize was cultivated on the experimental field.

In 1975 an amendment of 5 t/ha $CaCO_3$ was applied on the Grey Brown Podzolic pseudogleyed Soil on the one half of each variant. 160 wred number determinations were made in 2 stages (16 April and 1 July) on the herbicided area.

Table 1.

Analythical data for the Brown Podzolic Pseudogleyed soil

Depth cm	Humus %	N %	P mg/100 g sol	K mg/100 g sol	$CaCO_3$ %	pH (H_2O)	V %	Clay 0,002 mm %
0-20	2°3	0°13	1°1	6°7	0°0	5°5	65	21°9
30-40	1°7	0°09	1°0	5°8	0°0	5°4	66	21°9
50-60	1°0	0°05	1°0	5°3	0°0	5°7	73	26°1
60-70	0°4	0°03	0°9	5°3	0°0	6°0	78	29°4

Table 2.

Analythical data for the argillic truncated Brown Forest soil

Depth cm	Humus %	N %	P mg/100 g sol	K mg/100 g sol	$CaCO_3$ %	pH (H_2O)	V %	Clay 0,002 mm %
0-20	1°8	0°14	1°2	20°8	0°0	6°4	92	41°6
30-40	1°0	0°10	1°1	15°8	0°0	6°7	94	41°6
50-60	0°7	0°06	1°5	12°5	0°0	6°9	94	39°4
60-70	0°0	0°00	1°3	12°2	0°3	7°0	96	35°0

Results

The quantitative and qualitative participation of weed species, the general weeding of the wheat culture on the Grey Brown Podzolic pseudogleyed soil (tab.3) is different, depending upon the fertilization applied.

The maximum number of weed species - 30 - is identified in the variant without fertilizer and **amendment**. The average number of the species in the fertilized variants was 19, and in the fertilized and meliorated was 17. The number of weeds/m^2 is influenced by fertilization, thus the number of the weeds/m^2 increases by increasing the quantity of fertilizer. The highest degree of weeding has been observed in the variant fertilized with natural organic manure. Significant differences have been noticed in the weeding of fertilized and non meliorated variants (tab.4) and differences from significant to very significant (tab.5) in fertilized and meliorated variants.

Table 3.

The participation of weed species (weeds/m^2)to the weeding of wheat cultures on a Grey Brown Podzolic Pseudogleyed soil (Aşchileul Mic, 1978)

Weed species \ Treatment	without fertilizer a	without fertilizer b	$N_{50}P_{40}$ a	$N_{50}P_{40}$ b	$N_{100}P_{80}$ a	$N_{100}P_{80}$ b	$N_{100}P_{80}K_{80}$ a	$N_{100}P_{80}K_{80}$ b	G_{25} a	G_{25} b
Anagallis arvensis	-	-	-	-	-	-	-	1	-	-
Stellaria media	1	10	20	7	30	8	28	19	30	8
Veronica hederifolia	1	1	1	1	2	1	-	-	-	-
Viola arvensis	1	-	-	-	-	-	-	1	-	-
Galium aparine	1	1	6	5	12	7	12	12	6	1
Galium tricornutum	1	1	1	1	-	-	1	-	6	-
Galeopsis tetrahit	1	4	1	2	2	1	2	6	18	16
Lamium amplexicaule	1	-	-	-	-	-	-	-	10	-
Medicago lupulina	1	-	-	-	-	1	-	-	-	1
Poa annua	-	1	-	-	-	-	-	-	-	-
Polygonum aviculare	1	1	3	-	-	-	-	-	7	5
Polygonum convolv.	3	2	10	8	17	8	17	8	17	10
Raphanus raphan.	3	2	20	8	14	3	12	4	10	8
Ranunculus arvensis	3	1	3	1	1	1	-	-	-	-
Schleranthus annuus	2	1	15	1	20	5	25	12	16	5
Sinapis arvensis	2	2	16	8	20	6	18	16	15	10
Vicia pannonica	1	-	-	-	-	-	-	-	2	2
Amaranthus retrofl.	-	-	-	-	-	-	1	-	7	7
Bifora radians	1	1	-	-	-	-	-	-	-	-
Chenopodium album	1	-	2	-	-	-	8	-	4	3
Chenopodium hybridum	1	-	-	-	1	1	7	-	4	1
Echinochloa c.g.	4	2	-	-	10	-	8	-	4	4
Fumaria schleicheri	-	-	-	-	5	-	-	-	1	1
Papaver rhoeas	-	-	1	1	-	-	-	-	-	-
Polygonum persicaria	2	-	6	1	5	3	4	8	1	2
Setaria glauca	3	3	6	2	4	4	5	5	6	6
Stachys annua	-	1	-	-	-	1	-	-	-	-
Capsella bursa-p.	1	-	-	-	-	-	-	-	1	-
Centaurea cyanus	-	-	1	-	-	-	-	-	-	-
Matricaria inodora	-	-	-	-	-	-	2	1	-	-
Thlaspi arvense	1	-	-	-	-	-	-	1	-	-
Daucus carota	1	-	-	-	-	-	-	1	-	-
Falcaria vulgaris	1	-	-	-	-	-	-	-	1	-
Taraxacum officinale	1	-	-	-	-	-	-	-	1	1
Cirsium arvense	1	1	1	1	2	1	2	1	1	1
Convolvulus arvensis	1	1	-	-	-	-	-	-	-	-
Koripa silvestris	1	-	-	-	-	-	-	-	-	-
Sonchus arvensis	2	2	2	2	2	2	2	2	5	5
Number of species/m^2	30	19	18	15	16	16	17	16	23	20
Weeds total/m^2	45	38	115	49	147	53	154	93	173	97

a - without calcical amendment

b - with calcical amendment

Table 7.

The participation of weed species (weeds/m^2) the weeding of wheat cultures on an argillic truncated Brown Forest soil (Aşchileu Mic, 1978)

Treatment / weed species	without fertilizer	$N_{50}P_{40}$	$N_{100}P_{80}$	$N_{100}P_{80}K_{80}$	G_{25}
Adonis aestivalis	-	-	1	1	1
Avena fatua	1	-	2	2	1
Brassica nigra	-	1	5	5	7
Galium aparine	1	1	3	3	7
Polygonum aviculare	3	3	2	3	8
Polygonum convolvulus	3	10	15	14	16
Sinapis arvensis	1	3	2	3	8
Bifora radians	-	1	2	2	1
Chenopodium album	-	1	6	8	9
Echinochloa crus-g.	5	1	2	3	5
Setaria glauca	7	4	4	3	16
Stachys annua	-	1	1	-	1
Centaurea cyanus	1	1	1	1	1
Delphinium consolida	1	-	1	1	1
Medicago lupulina	3	1	1	-	1
Plantago major	-	3	2	1	1
Cichorium intybus	1	2	1	1	1
Cirsium arvense	1	2	2	2	4
Convolvulus arvensis	2	2	3	2	2
Lepidium draba	1	1	1	-	1
Sonchus arvensis	3	2	3	5	6
Agropyron repens	1	1	1	1	10
Lathyrus tuberosus	1	1	-	-	1
Allium sp.	-	1	1	1	1
Melampyrum arvense	-	1	1	1	1
Number of species/m^2	17	22	24	21	25
Weeds total/m^2	36	44	63	63	111

The degree of weeding of wheat cultures on the Brown Forest soil (argillic, truncated 2), is also remarcably significantly to very significantly different, depending on fertilization (tab.6). The species which cause the different degree of weeding (tab.7) are in a greater number, as compared to the same variant on the Grey Brown Podzolic Pseudogleyed Soil. The number of species is low in the outlier variant (without fertilizer) and high in the variant with natural organic manure.

Table 4.

The singnificance of weeding of wheat cultures on a Grey Brown Podzolic Pseudogleyed soil without calcical amendment Aşchileu Mic, 1978

Treatment	weeds/m^2	difference	significance
without fertilizer	44°6	-	outlier
$N_{50}P_{40}$	114°8	70°2	x x x
$N_{100}P_{80}$	146°8	102°2	x x x
$N_{100}P_{80}K_{80}$	154°0	109°4	x x x
G_{25} t/ha	173°6	129°0	x x x
DL 5 %	17°38		
1 %	23°94		
0,1 %	32°96		

Table 5.

The significance of weeding of wheat cultures on a Grey Brown Podzolic Pseudogleyed soil with calcical amendment

Treatment	weeds/m^2	difference	significance
without fertilizer	38°4	-	outlier
$N_{50}P_{40}$	49°2	10°8	x
$N_{100}P_{80}$	53°4	15°0	x x
$N_{100}P_{80}K_{80}$	98°2	30°2	x x x
G_{25} t/ha	96°4	58°0	x x x
DL 5 %	9°71		
1 %	13°37		
0,1 %	18°41		

Table 6.

The significance of weeding of wheat cultures on argillic truncated Brown Forest soil (Aşchileu Mic, 1978)

Treatment	Weeds/m^2	Difference	Significance
without fertilizer	37°6	-	outlier
$N_{50}P_{40}$	43°2	5°6	x x
$N_{100}P_{80}$	59°4	21°8	x x x
$N_{100}P_{80}K_{80}$	62°4	24°8	x x x
G_{25} t/ha	108°2	70°6	x x x

DL	5 %	3°46
	1 %	4°76
	0,1 %	6°55

Conclusions

1. Chemical and organic fertilization favoured weeding of the wheat culture on both soils included in experiments.

2. The contribution of fertilization to the increasing weeding degree is caused by the increased number of annual weeds. The increasing of the degree of weeding is mainly fulfilled on the Grey Brown Podzolic pseudogleyed soil by a higher number of weed plants/m^2 without increasing the number of species.

3. Calcium carbonate on the same level of fertilization or even on unfertilized soil, does not favour weeding in our experiments.

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RECHERCHES SUR LA RESISTANCE DE CERTAINES PLANTES AUX SOLS SALINS PAR LA DETERMINATION DE LA TOLERANCE DES GERMES

L.Muntean

Abstract:

MUNTEAN L., 1979, Recherches sur la resistance de la certaines plantes aux sols salins par la determination de la tolerance des germes. (Researches on the resistance of certain plants to soil salinity by measuring germ tolerance.) Not. Bot. Hort. Agrobot., 1979, X, 121 - 126. The behaviour of certain plants in young stage concerning their resistance to soil salinity was measured. The plants involved were the following: Secale cereale, Hordeum vulgare, Sorghum vulgare, Medicago sativa, Melilotus officinalis, Onobrychis viciaefolia, Cicer arietinum, Helianthus annuus, Carthamus tinctorius and Beta vulgaris. The measurments were done in vegetation pots on two salty soils: solonchak containing chlorides and carbonates (pH 7,6) and 3,16 % salinitiy (1,76 % chlorides) at depth of 0-20 cm; solonetz with chlorides and carbonates having, at depth of 0-15 cm, a water pH of 7,5 and 0,53 % salinity, and at 30-40 cm a 1,26 % salinity. Of the plants studied the highest tolerance to salinity, as early as germination stage, was proved by Hordeum vulgare, followed by Beta vulgaris and Carthamus tinctorius. With some plants, such as Helianthus annuus and Cicer arietinum there had been noticed an increased resistance of seedling to salinity as compared with the germination stage.

Index words: salt tolerance, germination, cultivated plants.

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