

CYPERUS ROTUNDUS CONTROL WITH HERBICIDES

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The well known and exotic nutgrass (*Cyperus Rotundus* L.) is undoubtedly the most hardening and infesting weed in agricultural areas, due to its aggressive power and easy propagation, since its multiplication is processed by seeds and by tubercles or rhizomes.

Nutgrass is important because it is a vegetal plague of difficult eradication resulting from its morpho-physiological characteristics, notably in its radicular system (constituted by a tubercles and rhizomes net), being fruitless the expenses to plough or to weed out, and attempts have been made lately regarding the possibility of exercising control by means of herbicides, the results of which are not highly encouraging considering the problem from an economical point of view.

Since the introduction of hormonal herbicides and the appearance of new products of total action or selective, or systemic and sterilizing which is being studied, research and applying chemical substances in the fight against nutgrass ciperaceae is being largely diffused in the tropical and sub-tropical regions.

In the present experiment, different herbicides were applied as a treatment system, post-emergent, without the employment of any mechanical methods.

## MATERIAL AND METHODS

A trial was established in strongly infested nutgrass area, located in Santos, State of Sao Paulo, Brazil, constituted by silica-argillous, pH varying from 5.2 to 6.6 on level ground installed in December 1969.

The outline adopted was that of occasional blocks, with 32 treatments and three repetitions, in parcels of 12 m<sup>2</sup> each, divided in four sub-parcels with pre-fixed concentrations of

a= 0.25%

b= 0.50%

c= 1.00%

d=2.00%

The herbicides employed in this trial with their respective dosages, are indicated as follows:-

TREATMENT	ACTIVE INGREDIENT (g or cc/m <sup>2</sup> )
A. - Agroxone (MCPA)	1.5
B. - MH - 30 (MALEIC HYDRAZIDE)	1.0
C. - Primatol 050 + Oil	1.0 + 2.0
D. - Primatol 050 (PROMETONE)	3.5
E. - Tri-fen (2, 3, 6 TBA)	3.5
F. - Daconate (MSMA)	1.0
G. - Santobrite (Pentachlorophenol)	3.0
H. - Not treated for comparison purposes	

The applications were effected with a back-pulverizer, mark "GINGE", of 14 liters capacity, stitch sieve 50, operating with 40 pounds of pressure, with attached "Teejet" 80.03, in a jet fan spread with an expenditure of 1.000 liters Ha.

The meteorological observations noted on the day of the application were:-

TEMPERATURES:-

Maximum .....32°C  
Minimum .....20°C

RELATIVE HUMIDITY.....81%

NEBULOSITY.....5/8

PLUVIOMETRIC PRECIPITATION .....0.0

The evaluation method adopted for the purpose of judging the efficiency of the herbicides on the nutgrass was the visual quantum, based on the index notes, which obeyed the following criterion: the sub-parcels totally covered with nutgrass note 0 (zero), the sub-parcels area completely cleaned off nutgrass note 100 (one hundred). This evaluation was made by various independent persons.



TABLE II

General Averages of the Notes Taken of Each  
Concentration in Connection With the  
Treatments

CONCENTR.	TREATMENTS								TOTAL
	A	B	C	D	E	F	G	H	
0.25%	57	82	67	163	158	0	5	0	532
0.50%	29	192	149	175	177	0	7	0	729
1%	24	267	226	192	287	0	40	0	1036
2%	38	217	290	260	295	0	4	0	1104
	148	758	732	790	917	0	56	0	3401

TABLE III

General Control of the Blocks With the  
Final Notes Attributed to Each Treatment:-

BLOCKS	A	B	C	D	E	F	G	H	TOTAL
I	35	263	234	282	316	0	38	0	1.168
II	86	256	253	188	342	0	18	0	1.143
III	27	239	245	320	259	0	0	0	1.090
	148	758	732	790	917	0	56	0	3.401

General Variance Analysis Resulted in Obtaining  
the Following Table

INFLUENCES	G.L.	S.Q.	VARIANCE	F
Sub-parcels	23	100.238		
Treatments	7	96.213	13.745	49.089+++
Blocks	2	99	50	5.6
Error (a)	14	3.926	280.4	
Total	95	133.883		
Sub-parcels	23	100.238	4.358	
Concentrations axb	1	809	809	3.627
" cxd	1	96	96	2.322
" axbscd	1	8.048	8.048	36.089+++
" x treatment	21	14.005	666.9	2.991+++
Error (b)	48	10.687	222.64	

$$C.V. = \frac{\sqrt{280.4 \times 2 \times 12 \times 100}}{427} = 42.65\%$$

This experiment was highly significant for the treatment and concentration.

$$d.m.s. = \sqrt{280.4 \times 2 \times 12} \times 2145 = 82035 \times 2145 = 176$$

In accordance with the minimum significant differences the efficiency of the treatment was as follows:-

1st place :Treat.	E-Tri-fen (2,3,6 TBA):	76.41%	Good effect
	D-Primatol 050 (Prometone):	65.83%	" "
	B-MH-30 (Maleic Hydrazide):	63.16%	" "
2nd place :Treat.	C-Primatol 050 + oil		Average "
3rd place :Treat.	A-Agroxone (MCPA):	12.33%	Weak "
	G-Santobrite (PCP):	4.6%	" "
4th place :Treat.	F-Daconate (MSMA):		Negative"
	H-Not treated for comparison purposes		

From the interpretation of the study of concentrations, the following average results were obtained:-

0.25%.....	22%
0.50%.....	60%
1%.....	86%
2%.....	92%

In accordance with the results obtained, it is verified that obviously the most efficient treatments are those of the greater concentrations indicated in the following order:-

1st	-	Concentration	1%
		"	2%
2nd	-	"	0.50%
4th		"	0.25%

In the manner the most recommendable concentration is that of 1% because a concentration of 2% can be superior to that of 1% by mere chance.

From the calculation of the minimum significant difference (d.m.s.) of the treatment x concentration, we have:-

$$\sqrt{222.64 \times 2 \times 3} \times 2.021 = 36.55 \times 2.021 = 73.87$$

It is evident, therefore, that the conclusion for the concentrations are only applicable to the treatments which occupy 1st and 2nd places (E,D,B, and C), due to the effect of the other treatments which were practically nulls.

#### DISCUSSION OF THE RESULTS

As shown in the statistical analysis, it can be verified that the treatment which had more influence in the control of the nutgrass were those with Tri-fen, Primatol 0.50 and MH-30, whereas the others showed effect of little or negative significance. However, the most eminent action and which better adapted itself to the edapho-ecologycs, was the 2,3,6 TBA, which in consequence of its residual action succeeded in reducing the grade of infestation of the nutgrass.

In one way or another it can be concluded that the herbicides placed in the first category notably the Tri-fen succeeded in diminishing the grade of infestation, although only temporarily, consequently requiring repeated treatment in order to obtain better control of this infesting weed, considering that its total and definite eradication is unattainable due to their peculiar system of propagation.