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EFFICIENCY OF WEED CONTROL HERBICIDE MIXTURE OF PENOXSULAN AND BUTACHLOR IN TRANSPLANTED RICE

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Abstract

The purpose of this study was to determine the efficiency of weed control herbicide mixture Penoxsulam + Butachlor in transplanted rice. The research was conducted in Jombor Village, Sewon District, Bantul Regency, Yogyakarta Special Region, in September - December 2022

A single-factor trial, with a complete randomized group design. As treatments are Penoxsulan + Butachlor 410 SC dose 410 gai / ha (D1), dose 512.5 gai / ha (D2), dose 615 gai / ha (D3), dose 717.5 gai / ha (D4), dose 820 gai / ha (D5) dose 1,025 g ai / ha (D6) and comparison herbicide penoksulam 25 g / I dose 15 gai / ha (D7), ethyl pirazosulfuron 10 % dose 6 gai / ha (D8), Oxadiargyl 600 g/l dose of 18 gai/ha (D9), triasulfurom 75% dose 11.3gai/ha(D10), Tiobencarb 4% and 2.4 D ipa 2% dose 1200 g ai/ha(D11) and without treatment (D12).

The results showed that (1) Application of Penoxsulam + butalachlor herbicide did not show phytotoxicity in rice plants. (2) Penoxsulan+Butachlor herbicide starting at a dose of 410 g ai/ha has good effectiveness for controlling *F. miliace*, *C. difformis*, *M. vaginalis*, *C. iria*, and *M. minuta.* While *weeds E cruss-galii and S. zeylanica* were very effectively controlled starting at a dose of 615 gai / ha and L. cinensis *was very effectively controlled starting at a dose of 717.7 gai / ha*. Penoxsulan+Butachlor starting at a dose of 717.5 gai/ha effectively controls *L. octovalvis.*

Keywords: Penoxsulan, Butachlor, Weed control efficiensy, Rice transplanting.

INTRODUCTION

Among the biotic stresses that can reduce rice yields are weeds. The average yield loss due to competition between weeds and rice is 40-60% even if weeds are not controlled it will reduce yields by 94-96% [1,2]. The dominant weeds in rice plants are grasses (Echinochloa colona, *Echinochloa crus-galli*, Eleusine indica, *Cynodon dactylon*); sedges *(Cyperus rotundus*, Cyperus iria, *Cyperus difformis*, Fimbristylis miliacea*) and broad-leaved weeds (*Alternanthera sessilis, *Commelina benghalensis*, *Cyanotis axillaris*, Sphaeranthus indicus, *Eclipta alba*) [3,4,5,].

Weed control using herbicides, is one of the mandated weed control practices because the results obtained are faster, the costs incurred are lower and provide satisfactory results. Herbicides are efficient and effective weed control agents in modern agriculture to control weeds in farmland [6,7]. Improper use of herbicides has led to ecological problems such as weed resistance [8], and contamination and damage to the environment [8]. Resistant populations are formed due to selection pressure by repeated use of similar herbicides over long periods. As a consequence of the repeated use of the same herbicide (the same type of active ingredient or the same way of working) over a long period in an area, there are two possible problems that arise in that area; That is, there is a dominance of herbicide-resistant guma populations or the dominance of herbicide-tolerant weeds.

Resistance and succession of weeds can be overcome/avoided by diversifying herbicide types Mixed herbicides that have different modes of action are alternatives to be applied, because they allow broadening the spectrum of action control and help control resistant species [9]. Herbicide mixtures will lead to reduced use of each chemical, when compared to use. However, lowering the rate of use of an herbicide will lower the selective pressure for resistance to each herbicide, thus lowering the evolutionary rate of resistance to each herbicide.

Penoxsulam,[3-(2,2-difluoroethoxy)-N-(5,8-dimethoxy[1,2,4]triazolo[1,5-c]pyrimidine-2-il)-, ,-trifluorotoluene-2-sulfonamide],, is a herbicide in the sulfonamide Triazolopyrimidines group. The active ingredient penoxsulam is used as a post-growth herbicide used in rice plants and as a growth inhibitor of the enzyme acetolacetate synthase (ALS) similar to imidazolinone and sulfonylurea [10]. This active ingredient has a broad spectrum, absorbed by weeds mainly through leaves, and a small part through roots, and translocated. Penoxsulam is a broad-spectrum herbicide that can control annual, annual, and biennial weeds on golf grass. Types of weeds that can be controlled include: Trifolium repens, Glechoma hederacea, Hydrocotyle spp., Salvinia minima Baker., and E. crassipes [11]. Penoxsulam can control all types of weeds (broadleaf, grass, and teki) except Leptochloa spp., Dactiloteneum spp., and C. rotundus [12].

Butachlor [2-chloro-2′,6′-diethyl-N-(butoxymethyl)-acetanilide] is a selective chloroacetanalide herbicide primarily labeled for pre-emergence control of annual weeds and some broadleaf weeds on rice. It can also be used in some fields of cereals and other vegetables, such as wheat, corn, cabbage, etc. [13,14,15). The active ingredient chloroacetanilide inhibits cell division by blocking protein synthesis. Selective systemic herbicides, absorbed mainly by germinating shoots, and by roots, by translocation of the whole plant, provide a higher concentration in the vegetative part than in the reproductive part. Butachlor is a pre-growing herbicide to control annual grass weeds and certain broadleaf weeds on rice plants.

Herbicides with active ingredients Penoxsulan and Butachlor have been widely researched as combination herbicides to obtain a wider spectrum of control and avoid weed resistance due to the continuous use of these herbicides. Based on this, a study was conducted with the aim of determining the effectiveness of herbicide combination of active ingredients penoxsulam + butachlor to control weeds in rice field plants.

RESEARCH METHODS

The research was conducted on farmers' land in Jombor Village, Sewon District, Bantul Regency, Yogyakarta Special Region, in September - December 2022. The ingredients used in this study were Ciherang cultivar rice plants, herbicide combination of active ingredients Penoxsulam and Butachlor, penoksulam 25 g / l (Clipper 25 OD), ethyl pirazosulfuron 10 %, Oxadiargyl 600 g / l, triasulfurom 75 %, thiobencarb 4% and 2.4 D ipa 2%. Pupunk Urea, SP 36 and KCl, insecticides on rice plants,

Single-factor treatment design and complete group randomized environment design. As a treatment is the dose of Penoxulan + Butachlor 410 SC as follows; dose 410 gai/ha (D1), dose 512.5 gai/ha (D2), dose 615 gai/ha (D3), dose 717.5 gai/ha (D4), dose 820 gai/ha (D5) dose 1,025 g ai/ha (D6) and hericide comparison penosulam 25 g/l (Clipper 25 OD) dose 15 gai/ha (D7), ethyl pirazosulfuron 10 %(TiGold 10 WP) dose 6 gai/ha (D8), Oxadiargyl 600 g/l (Raft 60 EC) dose of 18 gai/ha (D9), triasulfurom 75% (Logran 750 WG) dose 11.3gai/ha (D10), tiobencarb 4% and 2.4 D ipa 2% (Saturn-D 6 GR) dose 1200 gai/ha (D11) and without treatment (D12).

Each treatment was repeated for 4 repetitions, the area of the experimental plot was 4mX5m. Rice planting is carried out with a transplanting system, aged 21 days with a planting distance of 20cmX20cm. Herbicide application method using automatic sprayer, spray volume 300 L / ha, At the time of herbicide application, irrigation water conditions with a height of 2 cm. Subsequent maintenance, water regulation in accordance with the habits of local farmers.

Parameneter observations include a) Dominant weeds before the study, b) Percent poisoning rate (visual) of rice plants at 3, 7, 14, and 28 days after application (HAS). If poisoning is still visible, continue to be observed until the symptoms of poisoning there are no symptoms of poisoning. The phytotoxicity score on rice plants used is a scale of 0-10 as follows: 0=no poisoning; 1=visible light spots; 2 = very mild poisoning; 3 =very noticeable leaf poisoning. 4=yellowing leaves; 5=burnt leaves; 6 = 25%; leaf damage; 7=50% leaf damage;8=>90% leaf damage; 9=some plants are damaged, but do not die; 10=Off. c.). Weed control efficiency (WCE) per species (% visual biomass reduction vs control) at 14, 28,42 and 56 days after application was calculated using the Abbott formula for determining the effect on weeds at the species level and the effect on all weeds [16,17,18].

$$\text{WCE (\%)} = \frac{\text{DWC}-\text{DWT}}{\text{DWC}} \text{X } 100\%$$

where: DWC = Dry weignt of weeds in unweeded control, DWT = Dry weignt of treatment plot. Based on standard methods for herbicide efficacy tests [19] WCE 50%-69% effectiveness 50%, WCE 70%-84% medium effectiveness, WCE 85%-92% acceptable effectiveness, WSE 93%-99% Good effectiveness, and WCE 10% perfect effectiveness.

Statistical analyses were performed using SPSS software ver. 22.0 (IBM, Armonk, NY, USA). Analysis of variaans with average difference test treatment using Least significant different test with p = 0.05.

RESEARCH RESULTS

1. Dominant weeds before the study

The results of weed vegetation analysis before the study showed that the weeds contained in the experimental plot were *E. crus-galli (grasess) SDR* = 54.3%, C. iria, *C. difformis* and, *Fimbristylis miliacea* (sedges) with SDR values of *13.45%, 10.15%) and 10.10%,* Monochoria *vaginalis and* Eichornia crassipes respectively (broad-leaved weeds) with SDR= 12.6% and 94.5%.

2. Weed conditions before herbicide application

An indicator weed for herbicide application is *E. crus-galli* leafy 2-3 strands. The number of weeds on each treatment plot with the criteria of *E. crus-galli* with 2-3 leaves averaged 13-17 weeds, occurring 13 days after planting rice, so herbicide application was carried out at 14 days after planting.

3. Rice plant poisoning

The Penoxsulam + Butachlor herbicide tested showed no symptoms of poisoning in rice plants, while the comparison herbicide tiobencarb 4% and 2.4 D ipa 2% dose of 1200 g ai/ha showed symptoms of poisoning with a score of 2 (mild poisoning). Rice plant poisoning begins to recover after the age of 28 HSA.

2. Weed Control Efficiency (WCE) (%)

Weed control Efficiency 14,28,42 and 56 DAA. The target weed range is as follows.

a, Weed Control Efficiency of *E.crus-galii*

Table 1 shows that Penoxsulam+butachlor from 410 g.ai/ha and 512 g.ai/ha at all observation times, weed control percentage values ranged from 82.5%- 87.5%. At this dose it is still classified as acceptable effectiveness.

Penoxsulam + butachlor starting at a dose of 615 ml / ha in all observations had good effectiveness to completely control *E. crus-galii* with WCE 90% - 100%, while other comparison herbicides at 14 DAA. had moderate effectiveness with WCE ethyl pyrazolfuron 10% = 82.5%, Oxadiargyl 600 g/l = 72.50% and Triasulfuron 75% = 82.50. At 28 DAA and 42 DAA. all treatments tested except Tiobencarb 4% & 2.4D ipa

2% had good effectiveness with WCE above 90 percent. Tiobencarb 4% & 2.4D ipa 2% has an acceptable WCE effectiveness of 73%-85%.

b. Weed control Efficiency of *L chinensis.*

Table 2. it can be seen that, 14 DAA. and 28 DAA Penoxsulam 25 g/l and Penoxsulam + Butachlor doses 410 gai / ha, 512.5 g.ai/ha, dosis 615 g .ai / ha, comparison herbicides Penoksulam 25 g / l, Ethyl pirazosulfuron 10% and Oxadiargyl 600 g / 1 have WCE values of 85% -88.75% so that it can be said that their effectiveness is acceptable for controlling *L. cinensis*, while at 42 DAA and 56 DAA. Penoxsulam+butachlor dose 512.5 gai/ha and dose 615 gai/ha still have acceptable effectiveness, Penoxsulam + butachlor starting at a dose of 717.5 gai/ha has good effectiveness for controlling *L. cinensis.* Herbicides comparing Triasulfuron 75% and Tiobencarb 4% &2.4D from the beginning of growth have good effectiveness with WCE values of 92.5% - 99.0%. Oxadiargyl 600 g/l and ethyl pirazosulfuron 10% have moderate to acceptable effectiveness.

c, Weed control Efficiency of *F. Miliace*

Table 3. shows that *F. Miliace* begins with 28 DAA. on the control tile. Weed control efficiency of all treatments in 28 DAAs. WCE 100%, *F. Miliace* perfectly controlled. At 42 DAA. and 56 DAA. herbicide penoxsulan 25 g / l and herbicide Penoxsulan + butachlor various doses of effectiveness good with WCE values of 93.75%-96.25%. The comparison herbicide Ethyl pirazosulfuron 10% effective and Triasulfuron 75% has excellent effectiveness. For herbicides Oxadiargyl 600 g / l and Tiobencarb 4% &; 2.4D ipa 2% have moderate effectiveness with WCE values of 78.67% and 81.25% respectively

d, Weed control Efficiency of *C. difformis*

Table 4 shows that 14 DAA. all treatments tested had good to perfect effectiveness with WCE values of 92.5%-100%., while 28 DAA. except Oxadiargyl 600 g/l and Tiobencarb 4% & 2.4D ipa 2%, all treatments tested were good, but both herbicides were acceptable. At 42 DAA. and 56 DAA., Penoxsulam + Butachlor starting at a dose of 615 ml/ha and all comparison herbicides except Ethyl pirazosulfuron 10% had good to perfect effectiveness with WCE values of 90%-100%. Hebicide Penoxsulam + Butachlor dose 410 ml/ha and 512.5 ml/ha effectiveness is acceptable with WCE value of 82.5% - 87.5%.

e. Weed control Efficiency of *C.iria*

Table 5 shows that Penoxsulam 25g/l and Penoxsulam + Butachlor of various doses tested and the comparison herbicides ethyl pyrazosulfuron 10% and Triasulforon 75% have good to perfect effectiveness with WCE values of 93.75%-100%. Herbicides comparing Oxadiargyl 600 g/l and Tiobencarb 4%&2.4 D are still acceptable with WCE values of 85%-87.5%.

e, Weed control Efficiency of *S. zeylanica*

From Table 6. It is known that Penoxsulam 25 g / l, Penoxsulam + butachlor starting from a dose of 615 L / ha, Herbicide comparison Triasulfuron 75%, Tiobencarb 4% & 2.4 D has good effectiveness with WCE values of 91% - 98.75%, while Penoxsulam + butachlor doses of 410 L / ha and 512.5 L / ha and comparison herbicides

Oxadiargyl 600 g / l and Ethyl pirazosulfuron 10% have an effectiveness that is still accepted with WCE values of 83% -90%

e, Weed control Efficiency of *L. octovalvis*

From Table 7. it can be seen that in 14 DAA Herbicide Penoxsulam + butachlor various doses tested were not effective in controlling *L. octovalvis* weeds. while comparison herbicides except Penoksulam 25 g / l were effective in controlling the weed. In subsequent growth to 42 DAA. Penoxsulam+butachlor started at a dose of 717.5 gai/ha and all comparison herbicides effectively controlled *L. octovalvis*, while for 56 have the herbicides tested except Triasulfurom 75% were ineffective. At the end of growth, it is seen that the growth of L. octovalvis dominates the entire treatment plot, thus causing the percentage of weed control to be low below 75 percent.

f, Weed control Efficiency of *M. vaginalisi dan M. minuta*

The percentage of control of M. vaginalis and M. *minuta* is known that it was not found in the treatment plot or control plot until 28 DAA. In later growth M. vaginalis, and M. *minuta* were found in untreated plots, while in all treatment plots no one was found. Based on this, all treatments tested have a WCE value of 100% with perfect effectiveness.

CONCLUSION

The results showed that (1) herbicides Penoxsulam 25 g / l and Penoxsulam + butalachlor various doses tested did not show poisoning in rice plants, poisoning occurred in comparison herbicides Tiobencarb 4% and 2.4 D ipa 2% dose 1200 g ai / ha. (2) Penoxsulan+Butachlor herbicide starting at a dose of 410 g ai/ha has good effectiveness for controlling F. miliace, C. difformis, M. vaginalis, C. iria, and M. minuta. While the weeds E cruss-galii and S. zeylanica were very effectively controlled starting at a dose of 615 gai / ha and L. cinensis was very effectively controlled starting at a dose of 717.7 gai / ha. Penoxsulan+Butachlor starting at a dose of 717.5 gai/ha effectively controls L. octovalvis. (3) Herbicide comparison effectively controlled C. difformis, S. Zeylanica, L. Octovalvis, M. vaginalis and M. minuta, while E cruss-galii weeds were effectively controlled early in growth. Penoksulam 25 g/l and ethyl pirazosulfuron 10% effectively control C. iria, while other comparison herbicides are ineffective.

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Table 1. Weed control Efficiency of *E. Cruss-galii* 14, 28, 42 and 56 DAA.

Code	Herbicides	Dosis gai/ha	Weed control Efficiency of *E. Cruss-galii* (%) DAA			
			14	28	42	56
A1	Penoxsulam+Butachlor 410SC	410	86.3b	80b	80b	88.7b
A2	Penoxsulam+Butachlor 410SC	512.5	85.b	85b	85b	82.5b
A3	Penoxsulam+Butachlor 410SC	615	100a	90a	100a	98.7a
A4	Penoxsulam+Butachlor 410SC	717.5	92.a	95a	100a	98.7a
A5	Penoxsulam+Butachlor 410SC	820	97.5a	92.5a	100a	97.5a
A6	Penoxsulam+Butachlor 410SC	1025	98.7a	97.5a	96.25a	100a
A7	Penoksulam 25 g/1	15	97.5a	92.5a	93.75a	98.7a
A8	Etil pirazosulfuron 10%	6	82.5b	92.5a	90a	73.7a
A9	Oxadiargyl 600 g/l	18	72.5b	95a	97.5a	80b
A10	Triasulfrom 75%	11.3	82.5b	92.50a	91.2a	96.2a

Table 2. Weed control Efficiency of *L. cinensis*.14, 28, 42 and 56 DAA.

Code	Herbicide	Dosis gai/ha	Weed control Efficiency of *L. cinensis* (%)

			DAA			
			14	28	42	56
A1	Penoxsulam+Butachlor 410SC	410	85b	85.7b	82.5b	88.7b
A2	Penoxsulam+Butachlor 410SC	512.5	87.5b	85.6b	86.2b	82.5b
A3	Penoxsulam+Butachlor 410SC	615	98.7a	95a	97.5a	98.7a
A4	Penoxsulam+Butachlor 410SC	717.5	92.5a	96.7a	95a	98.7a
A5	Penoxsulam+Butachlor 410SC	820	93.7a	91.7a	98.7a	97.5a
A6	Penoxsulam+Butachlor 410SC	1025	96.2a	96.6a	96.2a	100a
A7	Penoksulam 25 g/l	15	98.7b	95a	95a	98.7a
A8	Etil pirazosulfuron 10%	6	85b	88.3b	90a	83.7a
A9	Oxadiargyl 600 g/1	18	83b	73.3c	85b	83b
A10	Triasulfurom 75%	11.3	96a	93.3a	92.5a	96.2a
A11	Tiobencarb 4% & 2,4D	1200	96a	93.3a	100a	92.7a

.Tabel 3. Weed control Efficiency of *F.miliace* 14,28,42 and 56 DAA..

Code	Herbicide	Dosis gai/ha	Weed control Efficiency of *F .miliace* (%)			
			DAA			
			14	28	42	56
A1	Penoxsulam+Butachlor 410SC	410	-	100a	95a	91.2a
A2	Penoxsulam+Butachlor 410SC	512.5	-	100a	97.5a	96.2a
A3	Penoxsulam+Butachlor 410SC	615	-	100a	100a	100.a
A4	Penoxsulam+Butachlor 410SC	717.5	-	100a	95.7a	96.7a
A5	Penoxsulam+Butachlor 410SC	820	-	100a	95.0a	96.2a
A6	Penoxsulam+Butachlor410SC	1025	-	100a	93.7b	93.7a
A7	Penoksulam 25 g/l	15	-	100a	100a	100 a
A8	Etil pirazosulfuron 10%	6	-	100a	100a	100a
A9	Oxadiargyl 600 g/l	18	-	100a	75.0b	81.0b
A10	triasulfurom 75%	11.3	-	100a	100a	100a
A11	Tiobencarb 4% & 2,4D	1200	-	100a	75.0b	88.75b

Table 4. Weed control Efficiency of *C. difformis* 14,28, 42 and 56 DAA.

Code	Herbicides	Dosis gai/ha	Weed control Efficiency of *C. difformis* (%)			
			DAA.			
			14	28	42	56
A1	Penoxsulam+Butachlor 410SC	410	93.7a	92.5a	86.2b	95.5b
A2	Penoxsulam+Butachlor 410SC	512.5	92.5a	92.5a	87.5b	82.5b
A3	Penoxsulam+Butachlor 410SC	615	100a	93.8a	100a	97.5a
A4	Penoxsulam+Butachlor 410SC	717.5	95a	90a	97.5a	100
A5	Penoxsulam+Butachlor 410SC	820	100a	97.5a	98.7a	100a
A6	Penoxsulam+Butachlor 410SC	1025	100a	98.7a	98.7a	100a
A7	Penoksulam 25 g/1	15	100a	97.5a	100a	10.0a
A8	Etil pirazosulfuron 10%	6	96.2a	93.7a	95a	87.5a
A9	Oxadiargyl 600 g/1	18	95a	82.5b	987a	100a
A10	triasulfurom 75%	11.3	100a	100a	97.0a	97.5a

A11	Tiobencarb 4% & 2,4D	1200	100a	85b	90a	90a

Table 5. Weed control Efficiency *C. iria* 14, 28,42 and 56 DAA.

Code	Herbicides	Dosis gai/ha	Weed control Efficiency *C. iria* (%)			
			DAA			
			14	28	42	56
A1	Penoxsulam+Butachlor 410SC	410	96.3a	96.7a	93.3a	98.7a
A2	Penoxsulam+Butachlor 410SC	512.5	98.8a	100a	100a	93.7a
A3	Penoxsulam+Butachlor 410SC	615	100.0a	100a	100a	100a
A4	Penoxsulam+Butachlor 410SC	717.5	96.3a	100a	100a	95.3a
A5	Penoxsulam+Butachlor 410SC	820	100a	100a	100a	100a
A6	Penoxsulam+Butachlor 410SC	1025	100a	100a	100a	100a
A7	Penoksulam 25 g/l	15	97.5a	100a	100a	100a
A8	Etil pirazosulfuron 10%	6	97.5a	93.3a	93.3a	99.5b
A9	Oxadiargyl 600 g/1	18	83.7b	86.67b	88.3a	83.75b
A10	Triasulfurom 75%	11.3	97.5a	96.6a	100a	100a
A11	Tiobencarb 4% & 2,4D	1200	87.5b	85.6b	95a	85b

Table 6. Weed control Efficiency *S. zeylanica* 14,28,42 and 56 DAA.

Kode	Herbicides	Dosis gai/ha	Weed control Efficiency *S. zeylanica* (%)			
			DAA			
			14	28	42	56
A1	Penoxsulam+Butachlor 410SC	410	80b	85b	83.75b	83.75b
A2	Penoxsulam+Butachlor 410SC	512.5	100a	93.3a	92.2a	93.5a
A3	Penoxsulam+Butachlor 410SC	615	93a	93.3a	100a	100a
A4	Penoxsulam+Butachlor 410SC	717.5	100a	93.3a	100a	100a
A5	Penoxsulam+Butachlor 410SC	820	100a	100a	100a	100a
A6	Penoxsulam+Butachlor 410SC	1025	100a	93.3a	100.a	100a
A7	Penoksulam 25 g/1	15	100a	100a	100a	100a
A8	Etil pirazosulfuron 10%	6	100a	90a	98.7a	100a
A9	Oxadiargyl 600 g/1	18	100a	100a	100a	100a
A10	Triasulfurom 75%	11.3	100a	100a	98.7a	100a
A11	Tiobencarb 4% & 2,4	1200	100a	100a	100a	100a

Table 6. Weed control Efficiency *L. octovalvis* 14,28, 42 and 56 DAA.

Code	Herbicides	Dosis gai/ha	Weed control Efficiency *L. octovalvis* (%)			
			DAA.			
			14	28	42	56
A1	Penoxsulam+Butachlor 410SC	410	87.5c	89b	82.5b	85c
A2	Penoxsulam+Butachlor 410SC	512.5	89	83,3b	83.8b	83c
A3	Penoxsulam+Butachlor 410SC	615	85c	82.5b	80b	83.7b
A4	Penoxsulam+Butachlor 410SC	717.5	96.3b	96a	98.7a	90b
A5	Penoxsulam+Butachlor 410SC	820	91.2b	96.2a	95a	95b
A6	Penoxsulam+Butachlor 410SC	1025	93.7b	96.3a	98.7a	95b
A7	Penoksulam 25 g/l	15	97.5a	90a	100a	95b

A8	Etil pirazosulfuron 10%	6	90.b	90a	93.7a	86.3b
A9	Oxadiargyl 600 g/l	18	100a	100a	100a	85b
A10	Triasulfurom 75%	11.3	100a	95a	100a	100a
A11	Tiobencarb 4% & 2,4D	1200	100a	95a	100a	85c