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Assessment of Some Herbicidal Combinations in Wheat Fields of Dierab, Saudi Arabia

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ABSTRACT. The efficiency of four herbicides, *viz.*, isoproturon (arelone), methabenzthiazuron (tribunil), fenoxaprop-ethyl (puma) and a ready mix formulation of mecoprop/dichlorprop/MCPA (duplosane super) and some of their combinations in controlling weeds in wheat fields as well as their effect on grain yield and its components were studied at the Agricultural Research and Experimental Station of Dierab in seasons 1991 and 1992 in two different sites. The experimental sites were of loamy sand soil and were under sprinkler and central pivot irrigation system.

The results of the study revealed that, *Malva* spp (common mallow) and *Lolium rigidum* (ryegrass) were the predominant weeds in the experimental area. Treatments of duplosane super at 3.5 and 2.5 L/ha; combinations of duplosane super (2.5 L/ha) with either tribunil (0.75 kg/ha), arelone (0.75 L/ha) or puma (2.5 L/ha); and tribunil (1.5 kg/ha) showed to be most efficient in controlling broad-leaved weeds. Arelone (1.5 and 0.75 L/ha) and puma (3.5 and 2.5 L/ha), on the other hand, gave slight control of the grassy weed *Lolium rigidum*.

The results also showed that duplosane super and its combinations as well as tribunil had significantly increased grain yield in wheat in the first site. On the other hand, duplosane super 2.5 L +puma 2.5 L/ha was the only treatment that significantly increased grain yield in wheat in the second season in the second site.

Cereal crops, especially wheat (*Triticum aestivum* L.), are well known to be highly sensitive to broad-leaved and grassy weeds during their early stages of growth. Weeds in wheat fields showed to be strong competitors for nutrients particularly nitrogen, light and moisture (Roberts 1982). When allowed to compete with crop plants, weeds were observed to deplete up to 91.2, 19.4 and 77.5 kg of available N, P and k/ha, respectively (Yadava *et al.* 1985). Almost hundred percent crop loss, due to weeds, was recorded (Lacey 1985) in wheat fields. According to Tewari and Mehrotra (1978), an increase of one gram in dry weight of weeds/m^2 was followed by a decrease of 143 g in grain yield and 158 g in straw yield in wheat fields. Chemical weed control proved to be an effective way for controlling broad - leaved and grassy weeds. In this respect, isoproturon was found to increase grain yields from 3.51 t/ha in the unweeded plots to 4.476 t/ha in the treated plots (Phogat *et al.* 1991). When applied at the rate of 0.75 or 1.0 kg/ha, isoproturon gave the best control of almost all broad - leaved and grassy weeds (Punia 1990 and Singh 1989). Higher doses (5 kg/ha) however, resulted in severely injurious effects on wheat growth and productivity (Tag El-Din *et al.* 1987 and 1989). Application of methabenzthiazuron at the rates of 1.5 and 2.0 kg/ha, on the other hand, increased both number of tillers (Singh *et al.* 1988) and grain yield (Hooda and Agarwal 1987) and reduced weed populations (Punia *et al.* 1990) in wheat fields. Duplosane super at 2.5 L/ha was found to selectively control many species of broad-leaved weeds in winter cereals (Bey *et al.* 1989). Fenoxaprop-ethy (puma) a herbicide containing the safener fenchlorazole, selectively controlled the major species of grassy weeds in winter wheat (Huff *et al.* 1989), and *Alopecurus myosuroides* was well controlled by a rate of 2.5 L/ha (Hallgren 1990). Diclofop-methyl, a selective herbicide for ryegrass in wheat, showed to have no adverse effects on plant height, dry weight, number of fertile spikelets, and grain yield (Khodayari *et al.* 1983).

In the present study, four field experiments were conducted in two different sites to evaluate the efficiency of four herbicides and some of their combinations, in controlling weeds in wheat fields in Dierab area, as well as their effects on wheat growth and productivity.

Materials and Methods

Four field experiments were carried out in two different sites, with 12 herbicidal treatments each in the 1991 and 1992 winter seasons at the Agricultural Research and Experimental Station (ARES) of King Saud University at Dierab. The experimental locations were of loamy sand soil under sprinkler irrigation with secondary-treated sewage water. Irrigation water for the first site was provided by means of fixed sprinklers (12 m apart) and by a central pivot system for the second. Sowing dates of wheat *(Triticum aestivum* cv. Yecora Rojo) for the two trials of the first season were the 25th of November and the 4th of December 1991, and the 22nd of November 1992 for both trials of the second season. The experimental design was a randomized complete block design with twelve treatments and four replicates (20 m^2 for each replica). The treatments, herbicidal names and rates of their

Table 1. Herbicidal treatments, rates of application, trade and common names, composition and formulations

Table 1a. Herbicidal treatments and rates of application

Treatments No.	Arelone L/ha	Tribunil kg/ha	Puma L/ha	Duplosane super L/ha
T1	1.75	–	–	–
T2	0.75	–	–	–
T3	–	1.50	–	–
T4	–	0.75	–	–
T5	–	–	3.50	–
T6	–	–	2.50	–
T7	–	–	–	3.50
T8	–	–	–	2.50
T9	–	–	2.50	2.50
T10	–	0.75	–	2.50
T11	0.75	–	–	2.50
T12	–	–	–	–

Table 1b. Herbicides trade and common names, composition and formulations

Number	Trade name	Common name	Composition	Formulation
1	Arelone	Isoproturon	500 g/L	Flowable
2	Tribunil	Methabenzthiazuron	700 g/L	Wettable powder
3	Puma	Fenoxaprop-ethyl	600 g/L	Flowable
4	Duplosane super	Mecoprop-p + MCPA + Dichlorprop	130 + 160 g/L + 310 g/L	Emulsifiable - concentrate

application are presented in Tables 1a and 1b.

The herbicidal treatments in two sites, were post - applied five weeks after sowing using a knapsack sprayer. Plots of the second site experiment, being heavily infested with ryegrass (*Lolium rigidum*) were treated, including T12, with diclofop - methyl (illoxan 28% EC, 3.5 L/ha) ten days after the application of the herbicidal treatments.

Percentages of individual weed coverage were estimated 75 days after sowing according to the visual rating system (0-100) adopted by Frans and Talbert (1977) and by Roberts (1982). In this system (100) referred to complete coverage of weeds; whereas (0) designate complete absence of weeds. At harvest, five spikes were collected from each plot and were used to determine spike length (cm), number of spikelets/spike, weight (g) and number of kernels/spike. Grain yield (t/ha) and 1000-grain weight (g) were estimated from an area of $1m^2$ that was harvested in each plot. Data obtained were subjected to analysis of variance and the treatments were compared by the LSD (Snedecor and Cochran 1967) test.

Results and Discussion

Experiments of site 1:

The annual weeds observed in the course of this location included *Malva* spp. *Lolium rigidum, Brassica nigra* (black mustard) and *cichorium endivia* (chicory). Among these *Malva* spp. was the most dominant (Table 2). Among the twelve treatments arelone (T1 and T2), puma (T5 and T6) and the control (T12) showed the highest coverage of *Malva* spp. their estimates being 69.86, 52.38, 49.00, 72.37 and 56.25% respectively, indicated their low efficiency in controlling this species.

Duplosane super (T7 and T8) as well as its combinations with either tribunil (T10) or arelone (T11) efficiently controlled *Malva* spp. and the total weed population as well (Table 2). Among these, duplosane super-tribunil combination (T10), resulted in the lowest percent coverage of *Malva* spp. (2.45%) and for the total weeds (3.75%), Table 2. Reports by Bey *et al.* (1989) and Singh *et al.* (1988) indicated that tribunil and duplosane super were highly effective in controlling *Malva* spp. and broad-leaved weeds; whereas arelone was only effective with *Lolium rigidum.*

In the second season, infestations of *Malva* spp. and *Lolium rigidum* were much more greater than those recorded in the first season (Table 3). As observed in the first season, arelone (T1 and T2) and puma (T5 and T6) were inffective in controlling *Malva* spp.; whereas duplosane super + tribunil (T10), as in the first season, proved to be the best treatment in this respect. Tribunil (T3 and T4) was slightly less effective in controlling *Malva* spp. than the duplosane super contained herbicides.

Table 2. Effect of the herbicidal treatments on coverage of individual weeds, grain yield and yield components of wheat for the first site during the first season (1991)

Treat.	% Weed Coverage					Yield and Yield Components					
	Malva spp.	*Brassica nigra*	*Cichorium endivia*	*Lolium rigidum*	Total of all weeds	Spike length (cm)	Number of spikelets /spike	Kernel number /spike	Kernel weight (g)/spike	Grains yield tons/ha.	1000 grains weight(g)
T1*	69.86	1.39	0.00	0.00	71.25	8.60	14.80	36.43	1.59	4.758	40.86
T2	52.38	8.38	0.50	0.00	61.25	8.60	15.50	38.53	1.36	4.568	38.83
T3	14.50	0.00	0.00	0.00	14.50	8.88	16.55	40.13	1.87	5.614	51.08
T4	33.48	0.00	0.06	0.21	33.75	8.80	15.50	36.20	1.44	4.922	48.09
T5	49.00	5.31	0.00	1.50	55.81	8.83	15.80	38.15	1.57	5.889	50.91
T6	72.37	1.47	0.45	1.93	76.25	8.55	15.80	33.00	1.23	4.076	42.45
T7	5.75	0.00	0.00	3.50	9.25	9.38	16.15	45.25	2.01	5.917	46.77
T8	7.00	0.00	0.00	0.25	7.25	9.25	16.20	45.65	2.08	6.353	50.95
T9	16.23	0.00	0.00	0.03	16.26	8.93	16.40	45.53	1.93	6.062	53.96
T10	2.45	0.00	0.00	1.30	3.75	9.48	16.40	46.65	2.14	6.444	52.11
T11	5.60	0.00	0.00	0.40	6.00	9.55	16.20	51.13	2.21	6.263	48.32
T12	56.25	5.25	0.00	2.25	63.75	8.55	15.80	35.95	1.27	3.831	36.51
L.S.D.**						NS	NS	8.31	0.48	1.447	4.65

NS = Not significantly different. *For legends: see Table (1)

**Least significant difference at the 0.05 probability

Table 3. Effect of the herbicidal treatments on coverage of individual weeds, grain yield and yield components of wheat for the first site during the second season (1992)

Treat.	% Weed Coverage				Yield and Yield Components					
	Malva spp.	*Brassica nigra*	*Lolium rigidum*	Total of all weeds	Spike length (cm)	Number of spikelets /spike	Kernel number /spike	Kernel weight (g)/spike	Grains yield tons/ha.	1000 grains weight(g)
T1*	96.27	1.37	1.87	99.51	7.45	13.40	20.70	0.31	0.540	14.32
T2	92.75	1.00	6.25	100.00	7.43	13.30	18.65	0.30	0.368	15.14
T3	19.13	0.00	38.38	57.51	8.90	15.10	35.80	0.85	1.774	23.49
T4	22.13	0.30	28.83	51.26	8.93	15.70	35.80	0.83	1.462	23.38
T5	91.53	1.69	3.79	97.01	7.58	13.70	18.85	0.30	0.559	15.84
T6	92.19	2.19	4.38	98.76	7.28	13.10	23.80	0.39	0.450	16.17
T7	4.25	0.00	50.75	55.00	8.88	15.10	34.95	0.75	1.611	21.19
T8	12.89	0.00	53.85	57.50	9.03	15.80	36.65	0.87	1.686	23.49
T9	8.88	0.00	18.63	27.51	9.73	16.70	46.95	1.37	1.746	28.59
T10	1.60	0.00	50.90	52.50	9.33	15.70	38.10	0.89	1.363	23.49
T11	7.00	0.00	23.00	30.00	9.33	16.00	41.70	0.99	1.768	23.08
T12	82.38	1.38	13.25	97.01	7.25	13.50	18.30	0.31	0.330	15.93
L.S.D.**					0.76	1.17	7.42	0.30	0.718	5.77

*For legends: see Table (1)

**Least significant difference at the 0.05 probability.

It is evident from Table 3 that percent coverages of *Lolium rigidum* under arelone (T1 and T2) and puma (T5 and T6) treatments were the least; whereas those of *Malva* spp. were the greatest (Table 3) among other species. Thus, apparently these treatments were more effective in controlling *Lolium rigidum* than in controlling *Malva* spp. The strong competitive ability of *Malva* spp., might have enabled it to excell *Lolium rigidum* in this respect.

Concerning yield and yield components in the first season (Table 2), almost all treatments, except for T1, T2, T4 and T6, resulted in higher grain yield than the control (T12). Highest grain yields (6.444 t/ha) were, however, recorded at T10 (*i.e.* duplosane super + tribunil); whereas lowest yield (3.831 t/ha) was observed at T12 (unweeded control). The increase in grain yield was mainly due to the decrease in weed population density (Tewari and Mehrotra 1978). Data on grain yield components indicated no significant differences among the twelve treatments on both spike length and number of spikelets/spike. In contrast, kernel weight was significantly increased by treatments T7, T8, T9, T10 and T11; whereas 1000-grain weight, except from T1 and T2, was significantly affected by all treatments (Table 2).

All treatments, including duplosane super (T7 and T8) and its combinations (T9, T10 and T11), in addition to tribunil (T3 and T4) significantly increased spike length, number of spikelets, number of kernel/spike, weight of kernels/spike, 1000-grain weight and grain yield (Table 3).

Experiments of site 2:

Tables 4 and 5 show that the populations of broad-leaved weeds at this experimental site were extremely lower than those recorded at the first experimental site (Tables 2 and 3). This might have been due to the post-emergence application of diclofop-methyl that had completely eliminated *Lolium rigidum* (Table 5) at this site.

The appearance of new species of broad-leaved [*Malva* spp., *Chenopodium murale* (common lambsquarters), *Beta vulgaris* (wild sugar beet), *Polygonum bellardii* (knotweed), *Cichorium endivia* and *Anagallis arvensis* (scarlet pimpernil)] and grassy weeds [especially *Bromus* spp. (brome)] at this site (Table 5) was appaently a result of differential selection pressure. It is evident from Table 5 that field plots sprayed with arelone (T1 and T2), tribunil (T3 and T4), and puma (T5 and T6) as well the unweeded check (T12), were highly infested with *Malva* spp. Duplosane super and its combinations, on the other hand, were effective in controlling *Malva* spp. and other weeds as well (Table 5).

Effects of the various herbicidal treatments on grain yield, spike length, number of spikelets and on weight and number of kernels/spike were generally low and were not significantly different from one another and from the unweeded control (Table 4). Among the twelve treatments, tribunil (T3) and duplosane super + arelone (T11), were the only treatments that significantly decreased 1000-grain weight when compared with the unweeded treatments (T12).

In the second season (Table 5), almost all treatments had no significant effect different on spike length, number of spikelets, weight and number of kernels\spike and on 1000-grain weight. In contrast to this, application of duplosane super + puma (T9), among all treatments, significantly increased grain yield (Table 5).

Table 4. Effect of the herbicidal treatments on coverage of individual weeds, grain yield and yield components of wheat for the second site during the first season (1991)

Treat.	% Weed Coverage					Yield and Yield Components					
	Malva spp.	*Brassica nigra*	*Polygonum bellardii*	*Lolium rigidum*	Total of all weeds	Spike length (cm)	Number of spikelets /spike	Kernel number /spike	Kernel weight (g)/spike	Grains yield tons/ha.	1000 grains weight(g)
T1*	1.33	0.00	0.00	0.67	2.00	9.37	16.27	48.47	2.33	4.206	49.52
T2	1.13	0.20	0.00	0.67	2.00	9.43	16.00	48.27	2.30	4.589	39.14
T3	0.00	0.00	0.00	0.00	0.00	9.60	16.40	48.20	2.27	3.472	35.74
T4	0.00	0.00	0.06	2.00	2.00	8.90	15.60	43.27	2.16	3.551	45.67
T5	1.25	1.25	0.17	2.33	5.00	9.07	15.60	43.67	2.08	4.196	46.46
T6	1.63	0.02	0.80	0.14	2.67	9.93	16.93	53.07	2.50	4.525	40.10
T7	0.00	0.00	0.00	2.33	2.33	9.03	15.87	43.13	2.15	3.338	51.16
T8	0.00	0.00	0.00	1.67	1.67	8.73	15.74	42.47	2.17	3.606	37.13
T9	0.00	0.00	0.00	1.67	1.67	8.77	15.60	42.67	2.18	3.709	42.06
T10	0.00	0.00	0.00	0.00	0.00	9.10	16.27	45.27	2.21	3.455	37.85
T11	0.00	0.00	0.00	5.33	5.33	9.53	16.67	50.20	2.30	3.817	35.82
T12	0.00	0.00	0.00	2.33	2.33	9.10	16.00	46.80	2.29	3.636	45.63
L.S.D.**						NS	NS	NS	NS	NS	09.18

NS = Not significantly different. *For legends: see Table (1)
**Least significant difference at the 0.05 probability

Table 5. Effect of the herbicidal treatments on coverage of individual weeds, grain yield and yield components of wheat for the second site during the second season (1992)

Treat.	% Weed Coverage									Yield and Yield Components					
	Malva spp.	*Chenopodium murale*	*Brassica nigra*	*Polygonum bellardii*	*Cichorium endivia*	*Beta vulgaris*	*Anagallis arvensis*	*Bromus* spp.	Total of all weeds	Spike length (cm)	Number of spikelets /spike	Kernel number /spike	Kernel weight (g)/spike	Grains yield tons/ha.	1000 grains weight(g)
T1*	18.25	0.00	3.56	2.01	0.00	0.00	0.00	0.18	24.00	09.65	15.70	45.30	1.97	3.623	43.46
T2	03.13	0.93	1.78	1.05	0.00	0.00	0.13	0.00	07.00	09.70	15.80	44.65	2.02	3.631	45.01
T3	04.65	0.75	0.55	0.00	0.00	0.00	0.00	0.06	06.00	09.30	14.90	44.30	2.10	3.920	47.50
T4	01.32	0.45	0.00	0.10	0.00	0.00	0.00	0.13	02.00	10.15	16.00	52.30	2.29	4.631	43.75
T5	06.15	6.50	2.48	1.25	1.56	0.31	1.25	0.00	19.50	09.78	15.70	49.00	2.17	4.135	44.39
T6	04.50	4.50	5.06	1.79	0.58	0.00	0.38	0.19	17.00	09.90	15.70	46.25	2.08	4.192	44.91
T7	01.58	0.08	0.00	0.00	0.00	0.00	0.07	0.03	01.76	09.20	15.30	45.25	2.00	4.085	44.07
T8	03.20	0.04	0.00	0.02	0.00	0.00	0.00	0.00	03.26	09.65	15.40	47.35	2.09	4.153	44.14
T9	01.21	0.04	0.00	0.00	0.00	0.00	0.00	0.00	01.25	09.70	15.50	45.55	2.08	5.005	45.76
T10	00.75	0.00	0.00	0.00	0.00	0.00	0.00	0.50	01.25	09.73	15.60	43.55	2.06	4.829	47.54
T11	02.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	02.75	09.45	15.30	45.50	2.10	3.770	45.92
T12	04.40	4.15	2.05	2.25	1.25	3.65	1.25	0.25	19.25	09.58	15.50	44.50	2.00	4.119	45.15
L.S.D.**										NS	NS	NS	NS	0.776	NS

NS = Not significantly different. *For legends: see Table (1)

**Least significant difference at the 0.05 probability

Conclusion

It is thus evident that effective control of *Malva* spp. (site 1) in the first season was achieved by tribunil and by duplosane super and its combinations. This resulted in an increase in the *Lolium rigidum* populations in the second season. On the other hand, the effective control of *Lolium rigidum* (site 2) by diclofop-methyl [commonly used for ryegrass control (Stanger and Appleby 1989)] resulted in the appearance of many broad-leaved weed species in the second season. Duplosane super + tribunil (T10) showed to be very effective in controlling broad-leaved weeds and consequently increasing highest grain yield; whereas puma (T5 and T6) and its combination (T9) did not. This might be due the selective effect of puma on some species of grassy weeds only (Huff *et al.* 1989). Arelone as indicated by Tag-El-Din *et al.* (1989) did not show sufficient control of *Malva* spp. and *Brassica nigra,* but as reported by many workers (Singh *et al.* 1982, Rathore 1985 and Ravn 1984) was very effective in controlling *Lolium rigidum.* Tribunil was moderatly effective in controlling *Malva* spp., but was highly effective for other broad-leaved weeds. Combinations of duplosane super with either puma, tribunil or arelone gave effective control of weeds and resulted in increased grain yield in the first site. Among these, only application of duplosane super + Puma (T9) resulted in increased grain yield in the second site.

References

Bey, J., Guyot, P. and **Lartaud, G.** (1989) The promise of mecoprop-p and dichlorprop-p for weed control in winter and spring cereals. *Weed Abstract.* **38**(6): 1584.

Frans, R.E. and **Talbert, R.E.** (1977) Design of field experiments and the measurement and analysis of plant responses. *In:* **Truelove, B. (ed.)** *Research Methods in Weed Science, Southern Weed Sci., Soc.* USA, 15-23 pp.

Hallgren, E. (1990) New herbicides for control of annual grass weeds in cereals. Swedish Univ. of Agric. Sci. **31:** 78-92. *Weed Abstracts.* **40**(2): 373, 1991.

Hooda, I.S. and **Agarwal, S.K.** (1987) Studies on irrigation, weed control and fertility levels on growth and yield of wheat. *Indian J. of Argon.* **32**(3) : 261- 264

Huff, P., Schumacher, H., Olfers, H. Von and **Banks, M.** (1989) Hoe 7113-worldwide results on selectivity and grass weed efficacy. *In Proc. of the Brighton Crop protection Conference, Weeds* **2:** 723-728.

Khodayari, K., Frans, R.E. and **Collins, F.C.** (1983) Diclofop a selective herbicide for Italian ryegass (*Lolium multiflorum*). Control in winter wheat (*Triticum aestivum*). *Weed Sci.,* **31**(4): 436-438.

Lacey, A.J. (1985) *Weed Control. In Pesticide Application: Principles and Practice,* **Haskell, P.T. (ed.)** Oxford: Oxford Univ. Press, 456-485 pp.

Phogat, B.S., Bhan, V.M. and **Singh, B.** (1991) Efficacy of some pre-and post-emergence herbicides either alone or in combinations for weed control of wheat. *Indian J. of Agron.* **36** (1): 103-105.

Punia, S.S., Malik, R.K. and **Bishnoi, K.C.** (1990) Relative efficacy of herbicide formulation in wheat. *Haryana J. of Agron.* **6**(1): 92-93.

Rathore, S.S. (1985) Testing post-emergence herbicides in wheat. *Ann. Conf. Indian Soc. Weed Sci.,* **45**.

Ravn, K. (1984) Chemical control of grass weeds in winter cereals. *Weed Abstract* **34**(4): 1089.

Roberts, H.A. (1982) *Weed Control Handbook.* BCPC, Blackwell Scientific Publication, London, 252-279 pp.

Singh, B., Singh, G. and **Singh, J.N.** (1982) Chemical weed control in wheat. *Ann. Conf. Indian Soc. Weed Sci.,* **3.**

Singh, S.J., Kumar, A., Singh, K.K. and **Mishra, S.S.** (1988) Evaluation of cultural and chemical methods of weed control in wheat. *Indian J. of Agron.* **33**(3): 303-307.

Singh, V.P., Tiwari, J.P. and **Kurchania, S.P.** (1989) Evaluation of fluroxypr and isoproturon against weeds in wheat. *Pesticides* **23**(7): 39-44.

Snedecor, G.W. and **Cochran, W.G.** (1967) *Statistical Methods,* 6th ed., Iowa, Iowa State Univ. Press, U.S.A.

Stanger, C.E. and **Appleby, A.P.** (1989) Italian ryegrass *(Lolium multiflorm)* accessions tolerant to diclofop. *Weed Sci.* **37**(3): 350-353.

Tag-El-Din, A., Al-Rajhi, D., Ghandorah, M.O. and **Mostafa, S.** (1987) Effect of glyphosate residues on field performance of some herbicides used on wheat. *J. Coll. Agric.* King Saud Univ. **9**(2): 295-305.

Tag-El-Din, A., Ghandorah, M.O., Bait-Al-Mal, M. and **Mostafa, S.** (1989) Evaluation of some herbicides for weed control in wheat (*Triticum aestivum* L.). *J. Coll. Agric.* King Saud Univ. **1**(1,2): 123-135.

Tewari, R.N. and **Mehrotra, O.M.** (1978) Note on intrinsic relationship of weed growth with performance of wheat. *Indian J. Agric. Res.* **12**(2): 101-103.

Yadava, S.K., Kumar, A. and **Bhan, V.M.** (1985) Effect of herbicides on the uptake of nutrients by wheat and associated weeds. *Ann. Conf. Indian Soc. Weed Sci.*, **36**.

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تقويم فعالية خلائط مبيدات الحشائش في القمح بديراب بالمملكة العربية السعودية

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جرى تقويم فعالية عدد من خلائط مبيدات الحشائش على القمح خلال موسمي ١٩٩١و١٩٩٢ وتشمل المعاملات على آريلون وتربيونيل وبوما ودوبلوسان سوبر بالإضافة إلى خلائطهما . ولقد أجريت التجارب في منطقتين تحت نظام الري بالرش حيث كانت الخبيزة هي الحشيشة السائدة في أحداهما والهيبان في الآخرى .

ولقد اتضح أن دوبلوسان سوبر (٢,٥ - ٣,٥ لتر / هكتار) أو خلائطة مع كل من تربيونيل (٧٥, كجم / هكتار أو آريلون (٧٥, كجم / هكتار أو بوما (٢,٥ لتر / هكتار) هم أكفأ المعاملات في مكافحة الحشائش عريضة الأوراق بينما كانت فعالية آريلون أو بوما محدودة في مكافحة الحشائش النجيلية .

وأدت أيضا معاملات دوبلوسان سوبر وخلائطة بالإضافة إلى تربيونيل زيادة إنتاجية القمح في المنطقة الأولى بينما كانت معاملة دوبلوسان سوبر مخلوطًا مع بوما (٢,٥ لتر من كل منهما للهكتار) هي الوحيدة التي أعطت زيادة في إنتاجية الحبوب في المنطقة الثانية .