

## EFFECT OF PRE-EMERGENCE HERBICIDES ON WEED CONTROL, SEED GERMINATION AND SEEDLING VIGOUR IN PEACH STONE NURSERY

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### Abstract

*To study impact of eight treatments viz control (no weeding), hand weeding, Tolkan, Tribunil, Gesapex-combi, Dicuran-MA, Sundachlor and Fusilade-super on weed control, germination, seedling vigour and cost benefit ratio in peach nursery. This experiment was conducted at Horticulture Farm, Agricultural University Peshawar during the year 1991-92. Weed density (573.77/m<sup>2</sup>) and weed dry weight (2368g/m<sup>2</sup>) were significantly higher in control while least weed density (17.7/m<sup>2</sup>) and dry weight 76.33g/m<sup>2</sup>) were found in Sundachlor treated plots. Maximum germination (34.8) was recorded in Gesapex-combi and minimum (30.2) was recorded in Fusilade-super and maximum survival (99.2%) in Dicuran-MA. Maximum plant height (78.2cm) and plant girth (0.66cm) were in Dicuran-MA plots. Highest benefit cost ratio of 270:1 in Tribunil and minimum of 18:1 was observed in hand weeding.*

### Introduction

Stone fruits are important summer fruits grown in NWFP. Peach "Peshawar Local" has been commonly used as a root stock for all stone fruits in Peshawar valley. Frequent rains during germination make hinderance in hoeing and weeding and due to excessive weeds, germination and seedlings vigour are very poor. Nevertheless hand weeding is very laborious and causes injuries to young seedling. Ramirez and Martin (1973) found promising results by Simazine-application @ 2-4 kg a.i./ha and Terbacil @ 2.4 kg a.i./ha for control of *Brassica campestris*, *Convolvulus arvensis*, *Amaranthus deflexus* and *Sorghum halepense* in peach orchard. Gautam and Chauhan (1984) got excellent weed control with 3-4 kg Terbacil/ha. The higher dose of Atrazine reduced the growth of peach seedlings. Daniell (1984) found good to excellent control of Johnsongrass in peach with 0.56-1.12 kg/ha BAS 9052 (Sethoxydim); 0.28-0.84 kg/ha PP009 (Fluazifop) and 2.24 kg/ha Glyphosate. Molnar (1984) recommended fenteracol + Atrazine (Buvinol) and Ronstar for the control of *Convolvulus arvensis*. Hartley (1987) got best control of weeds in peach by application of Alachlor @ 3 kg/ha, Atrazine @ 2 kg, Simazine @ 3 kg, Terbacil 1 kg and Terbutryn @ 2.8 and 5.8

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kg/ha. Rahim et al. (1991) completely controlled weed. *Sorghum halepense*, *Cynodon dactylon*, *Convolvulus arvensis*, *Medicago denticulata* and *Anagalis arvensis* by Tribunil @ 2 kg a.i./ha, Bladex @ 0.5-1.0 kg/ha alone and in combination with pronamide @ 0.5 kg a.i./ha.

This study was undertaken to see the effect of different herbicides on weed control, Peach stone germination and subsequent vigour of peach seedlings.

### ***Materials and Methods***

Experiment was conducted on peach nursery at Horticultural Research Farm, Agricultural University Peshawar, in RCB design having eight treatments and six replications. Field having total area of 48 square meters was divided into 6 blocks and then each block was subdivided into 8 Plots, each having 1m x 1m area. Treatments were control, hand weeding, Tolkan 50wp @ 2 kg/ha Tribunil 70wp @ 1.7 kg/ha, Gesapex-combi 80wp @ 3.7 kg/ha, Dicruan MA 60wp @ 2.5 kg/ha, Sundachlor 60 EC @ 2 lit/ha and Fusilade-super 12.5EC @ 1.0 lit/ha.

Forty eight peach stone were sown 6cm deep in two rows in each subplot. The subplot of one treatment was thoroughly sprayed with water to determine the exact quantity of solution to be sprayed. The herbicides in powder were dissolved in water and then the volume was made to required quantity. The liquid herbicide were put in water and the mixed thoroughly. Herbicides were sprayed within 7 days after sowing. Weed density was determined on January 20, and March 7, 1992. Weed counting was not taken in hand weeded plots, as weeding was practiced on regular basis.

### ***Results and Discussion***

**Weed density:** Herbicides significantly affected weed density (Table 1). Maximum weeds (215.9/m<sup>2</sup>, 2573/m<sup>2</sup>) were found in plots where no weeding was done (control) where as minimum weeds were found in plots treated with Gesapex combi and sundachlor. Gesapex combi and sundachlor are from amide and triazine groups which readily enter in germinating seedling through shoot or roots but show limited translocation in plants, therefore kill the seedling at germinating stage. Weeds completely controlled by herbicides were Johnson grass, bermuda grass, bermuda, Prickly lettuce, chenopodium Spp, and Nutsedge. Similar findings were obtained by Rahim et al. (1991), Daniell (1984), Ramirez and Martin (1973) who controlled convolvulus, Brassica, Amaranthus and sorghum etc with Atrazine and other herbicides.

**Weed dry Weight:** Maximum weed dry weight of 2368 g/m<sup>2</sup> was found in no-weeding plots while minimum weed dry weight of 76.33 g/m<sup>2</sup> was found in Sundachlor treated plots (Table 1). Similar results have also been reported by Wahid et al. (1991) who got reduced dry weight of weeds by Dicuran-MA.

Table 1. Weed density and dry weight, seed germination, survival of seedling and vigour as influenced by herbicides

Treatments	Weed density/m <sup>2</sup> on		Weed dry wt/m <sup>2</sup> (g)	Germination %	Survival %	Seedling height (cm)	Seedling girth (cm)
	20/1/92	17/3/92					
Control	215.9 a	573.77a	2638 a	31.9	98.9	56.1 cd	0.48 bc
Hand weeding	-	-	-	32.29	97.3	66.7 b	0.53 bc
Tolkan	24.3 c	53.1 bc	217.7 bc	32.9	97.7	66.6 b	0.55 b
Tribunil	13.5 c	33.9 c	144.5 bc	32.99	99.1	63.8 bc	0.54 bc
Gesapex-combi	8.5 c	19.9 c	82.17 c	34.8	91.2	55.4 d	0.40 d
Dicuran MA	18.1 c	39.6 bc	164.7 bc	31.9	99.2	78.2 a	0.66 a
Sundachlor	10.5 c	17.7 c	76.33 c	31.56	87.9	57.9 cd	0.44 cd
Fusilade-super	73.3 b	88.3 b	368.3 b	30.2	98.2	69. bcd	0.52 bc
L.S.D	34.24	55.01	226.6	-	-	8.298	0.105

Means of the same category having at least one common letter are not significant at 5% level of significance using LSD test.

Table 2. Economic efficacy of different weeds control treatments on per hectare basis

Treatments	Weeding Cost (Rs.)	Herbicide Labour Charges (Rs.)	Seedling/ha	Market Price (Rs.)	Total Cost (Rs.)	Net Income (Rs.)	Benefit: Cost
Control	6640	-	152000	152000	6640	146360	22:1
Hand Weeding	8000	-	151000	151000	8000	143000	18:1
Tolkan	600	40	154000	154000	640	153360	240:1
Tribunil	542	40	158000	158000	582	157418	270:1
Gesapex-combi	1200	40	152000	152000	1240	150760	122:1
Dicuran MA	700	40	149000	149000	740	148260	200:1
Sundachlor	560	40	132000	132000	600	131400	219:1
Fusilade-super	710	40	142000	142000	750	151250	188:1

**Germination:** As shown in Table 1 weed control treatments had no significant effect on germination,. However maximum germination (34.8%) was found in Gesapex combi and minimum (30.2%) in fusilade super. Maximum germination may be due to minimum weed population, no phyto-toxin produce by weed to inhibit germination.

**Seedling Survival:** There is also no significant difference in seedling survival (Table 1). Dicuran MA exceed all other treatments in survival percentage followed by Tribunil and least survival with sundachlor spray. The least survival with sundachlor may be due to toxic effect.

**Seedling Vigour:** Significantly highest seedling height (78.2cm) and girth (0.66cm) was found in Dicuran treated plots while least seedling vigour (55.4cm height and 0.40 cm girth) was found in Gesapex-combi.

**Cost Benefit ratio:** It is clear from Table 2 that the plot sprayed with herbicides yielded more plants than control and hand weeding. In hand weeding we removed weeds more than once. Therefore 200 laborers are required at the cost of Rs. 8000/ha. In this way benefit cost ratio comes to be 18:1. The benefit cost ration due to Tribunil is 270:1 which is the highest. From the economic analysis, it is clear that hand weeding and no weeding are time consuming and expensive for commercial purpose. Herbicides application in peach nursery is economical for better production for root stock.

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