EFFECT OF WEED MANAGEMENT PRACTICES ON WEED POPULATION, WEED DRY MATTER AND YIELD AND ECINOMICS OF UPLAND DIRECT SEEDED RICE (ORYZA SATIVA) CN. NAGALAND LOCAL

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Rice is the major crop of the North Eastern Hills Region occupying more than two third of the total cropped area (Barthakur, 1997). In Nagaland, rice being the most important food crop of the people, it is grown throughout the entire stae mostly on hill slopes as upland direct seeded rice under rainfed conditions, covering an area of about 1, 91,000 ha (anon, 1995). The yield of rice crop grown in Nagaland under upland rainfed conditions is always low because of the severe weed problem. The weed problem is more occur in direct seeded upland rice than other rice cultures. In Nagaland, manual weeding is very much common. However, manual weeding is a tedious task and it is also into feasible or viable on large scale. During peek period of sowing non-availability unprofitable. Under such situations use of herbicides for management of weeds tends to be a promising proportion. However, continuous use of same herbicide may result in increase problems of weed species becoming tolerant to them. Therefore, it is logical to develop such weed control measures where both cultural and chemical methods may be combined to present the farmer a feasible and viable way felt pertinent to undertake an experiment on the effect of weed management practices on the density and day matter production of weed, yield and economics upland, direct seeded, raifed rice in nagaland.

The experiment was conducted during the year 1998 at the experimental farm of the School of Agricultural Sciences & Rural Development, Nagaland University, Medziphema, Nagaland located at 250 45' 43" N latitude and 93053'04" longitude at an altitude of 304.8 m above sea level. The climate of experimental area enjoys sub humid tropical climate with high humidity and moderate temperature with medium to high rainfall. The temperature ranges between 120C during wither to 320 during summer. The average rainfall carries between 2000-2500 mm, received for about five months (May to September). The soil is acidic in nature (pH 4.2) and high in organic carbon (1.07) and available P2O5 (36.73 kg./ha) and in available K2 O (110 kg/ha)

The weed flora in the experimental area comprised of grasses, sedges and broad leaves. The important weeds were Elusine indiacL, Digetaria sanguinalis.,cynodan dactylon, Setaria glauca , Imperata cylindrical in grasses, Cyperus rotundas in Sedges and Borreria hispida L, Ageratum conzyoides L., Mikania micrantha, Eupatorium odoratum, Valerionaefolia, Erechtthites uderianalfelia, euphorbia hirta, Amaranthus viridis and Mimosa pudica (L) in broad leaf weed. Weedy check (T1) treatment recorded significantly highest in number of weed and higher weed dry matter production than rest of the treatments at all the stages of growth.

All the weed control measures recorded significantly the higher values of weed population an dweed dry matter/m2 over weed free (T2) treatment. Application of butachlor (preemergence) @ 1.5 kh/ha in combination with 2,4-D @ 1kg/ha at 20 DAS (T11) and butachlor (pre emergence)

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@ 1.5 kg/ha in combination with one hand weeding at 40 DAS (T10) and butachlor as pre emergence @ 1.5kg/ha in combination with one hand weeding at 20 DAS (T9) recorded the lowest number of weed were at par with hand weeding at 20 and 40 DAS (T5). Weed free treatment (T2) had the highest weed control efficiency followed by T5, T10, T9 and T11 and weedy check (T1) recorded lowest WCE. This is due to the fact that different weed control measures applied in various treatments reduced the weed population and weed dry matter to various degree resulting into reduced competition from weeds for growth factors which enabled the crops to perform better in these treatments and utilized the growth factors in better manner up to different levels. This is in agreement with the finding of Vaishya et.al. (1992) who reported 100 % WCE in weed free treatment.

There was significant difference in the grain yield of rice due to different wed control measures. Weed free treatment (T2) recorded the highest grain yield, which has found to be significant superior over all the other treatments. The weedy check treatment was found to be significant inferior to all the other weed control treatments. Treatment (T5) was at par to treatment (T9) and treatment (T10) but significant superior to the rest of the treatments. Treatment T3, T4, T6, T7, T8 and T9 were at par, but statistically superior to weedy check. The highest straw yield recorded with weed free (T2) which were at par to that of T5, T10, T9, T11, T8 and T7 treatments. Weedy check (T1) recorded the lowest straw yield. There was significantly superior over all the other treatments. The weedy check treatment was found to be significantly inferior to all the other weed control treatments. Two hard weeding (T5) was at par to T9 and T10 but significantly superior to the rest of the treatments. Treatments T3, T4, T6, T7, T8 and T9 were at par, but statistically superior to weedy check. The highest straw yield recorded with weed free (T2) treatment. Which was at par to that of T5, T8,T9, T11, T6 and T7 treatments. Weedy check (T1) recorded the lowest straw yield.

Pre-emergence application of butachlor @ 1.5 kg/ha and one hand weeding at 40 DAS (T10) recorded at net profit of Rs. 4,461.8/ha with a cost benefit ratio 1:1.44. this treatment was closely followed by two hand weeding at 20 and 40 DAS (T5) and pre emergence application of butachlor @ 1.5 kg/ha + one hand weeding at 20 DAS (T9) with net profit of Rs. 4342.8 and Rs. 3,661.8 and cost higher net profit ratio of 1:1.40 and 1:1.36 respectively. Weed free treatment (T2) could not record higher net profit as compared to T10, T9 and T5 treatments. This was because of the fact that cost of keeping the crop seed to T10, T9 and T5 treatments. This was because of the fact that cost of keeping the crop weed free manually in this treatment was more resulting into net profit.

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Table 1 Effect of weed management practices on weed population weed dry matter yield and economics of upland direct seeded rice

Treatments	Weed Population (No/m^2)	Weed dry matter (g/m^2)	WCE (%)	Straw yield (q/ha)	Rice yield (q/ha)	Gross income (Rs/ha)	Cost weeding (Rs/ha)	Total cost of cultivation (Rs./ha)	Net income (Rs.)	Cost benefi t ratio
T_1-Weed dry check	144.6	459.3	-	24.06	8.7	4350	-	8607.2	- 4257.2	1:0.50
T_2-weed free	0.00	0.00	100	43.4	39.1	19550	9450	18057.2	1492.8	1:1.08
T_3 – one HW at 20 DAS	94.6	197.0	62.5	37.0	20.6	10300	1050	9657.2	1042.8	1:1.10
T_4- one HW at 20 & 40 DAS	67.3	114.0	64.8	35.7	21.4	10700	1050	9657.2	1042.8	1:1.10
T_5-tow HW at 20 & 40 DAS	54.3	78.3	78.3	42.4	30.1	15050	2100	10707.2	4342.2	1:1.40
T_6-2,4-D @ 1kg/ha at 20 DAS	90.0	243.3	43.8	35.2	17.2	8600	370	8977.2	- 377.2	1:0.95
T_7-2,4-D @ 1kg/ha at 40 DAS & one HW at 40 DAS	65.3	131.0	67.9	37.1	22.0	11000	1420	10027.2	973.8	1:1.09
T_8 – Butachlor 1.5 kg/ha PE	86.6	204.3	58.7	37.2	18.6	9300	281	8888.2	411.8	1:1.04
T_9- Butachlor 1.5kg/ha PE& one HW at 40 DAS	62.6	145.3	69.2	37.5	27.2	13600	1331	9938.2	3661.8	1:1.36
T_{10}-Butachlor 1.5kg/ha PE & one HW at 40 DAS	59.3	115.3	71.0	39.2	28.8	14400	1331	9938.2	4461.8	1:1.44
T_{11}- Butachlor1.5 kg/ha PE & 2,4-D @ 1kg/ha at 20 DAS	11.5	154.6	68.7	37.2	23.3	11650	651	9258.2	2391.8	1:1.25
CD at 5%	16.26	125.0		6.36	5.5					