Indian J. Weed Sci. 1985 Vol. 17 [3] : 65 - 72

Proceedings of The 1985 Annual Conference of Indian Society of Weed Science.

The conference was held on 6th and 7th May, 1985 at Gujarat Agricultural University, Anand, Gujarat.

The proceedings of the various technical sessions and the recommendations there of are given as under.

TECHNICAL SESSIONS.

1. Weed Control in Rice.

Chairman : Dr. S.K. Mukhopadhyay

Rapporteurs : Dr. Govindra Singh

Dr. A. Mohamed Ali.

Out of the 30 papers scheduled for presentation, 20 were presented at the session covering weed control in rice nursery (4 papers), upland direct seeded rice (7 papers) direct seeded puddled rice (1 paper) and transplanted rice (8 papers).

A. Weed Control in Rice Nursery.

Butachlor, thiobencarb, oxadiaxon, pendimethelin and oxyfluorfen were reported to be tested for weed control in rice nursery under different agroclimatic conditions of the country. Under Hissar conditions with light soils, butachlor at 0.75 kg/ha, under Pantanagar heavy soil condition and in Himachal Pradesh situations butachlor at 1.0 kg/ha was found effective for weed control in rice nursery, when applied at 6 to 8 days after seeding. Under Madhya Pradesh conditions, butachlor and thiobencarb at 1.5 kg/ha effective.

B. Weed Control in Upland Rice.

Preemergence thiobencarb was effective for weed control in upland rice at 1.5 kg/ha in hilly terrains of Meghalaya, 2 to 3 kg/ha in Jabalpur, and 1 to 2 kg/ha in Hissar. Preemergence butachlor at 1.0 kg/ha followed by one hand weeding at 20-25 DAS was found effective at IARI, New Delhi.

Preemergence application of oxyfluorfen at 0.1 kg/ha at 1 DAS was reported effective in Ranchi situation. Preemergence oxadiazon at 1.0 kg/ha could control

Echinochloa crus-galli and *Cyperus laria* in Hissar. Maximum uptake of nutrients by rice crop could be obtained by controlling weeds with preemergence application of 1.5 kg/ha at Varanasi. Hand weeding twice produced more yield than application of herbicides like butachlor (2.0 kg/ha) and thiobencarb (2.0 kg/ha) in Raipur condition. When upland paddy was sown by drilling, preemergence appllcation of oxadiazon 1.0 kg/ha followed by one hand weeding was more effective at Jabalpur, while piperphos 1.5 kg/ha and thiobencarb 2.0 kg/ha were as effective as two hand weedings at Pantnagar. Three hand weedings at 15, 30 and 45 DAS did not show any superiority over two weedings at 15 and 30 or 15 & 45 DAS.

C. Weed Control in Puddled Rice.

At CRRI, Cuttack, the new non-petro chemical formulation of butachlor (Machete EN), was found to be comparable with EC formulation of butachlor and thiobencarb at 1.0 kg/ha.

D. Weed Control in transplanted Rice.

From the Visva Bharati, Sriniketan, West Bengal, with slightly acidic sand loam lateritic soils, it was reported that an application of readymade combination product 45 EC of fluchloralin (20% ai) & 2,4 DEE (25% ae) applied at 3 DAT at 0.9 kg/ha showed remarkable improvement over fluchloral alone. The combination product provided more broad spectrum effect showing control of all categories of weeds viz. grasses, broadleafed weeds and sedges. The critical period of weed-crop competition was 35 DAT at Visva-Bharati and Hissar. The granular application of 2.4-D IPE (G) at 1.0 kg/ha applied at 3 DAT showed effective suppression of even annual grasses at germination stage at Visva-Bharati. From Hissar, granular formulations of butachlor at 1.5 kg/ha, oxadiazon at 0.75 kg/ha and pendimethalin at 1.5 kg/ha were found quite effective.

Under Tamilanadu situations, herbicide mixtures like butachlor, thiobencarb, oxadiazon and fluchloralin with 2.4 DEE were found to be effective and cheaper than the individual application of these herbicides. In Allahabad, mixture of thiobencarb and 2.4-DEE was found to be most effective in transplanted rice. Regarding time of transplanting under Haryana conditions, weed density was more when transplanted in the months of June than transplanting in the month of July.

2. Weed Control in Cereals.

Chairman : Mr. P.N. Pande
Rapporteurs : Dr. Govindra Singh
Dr. Aparbal Singh.

Out of the 35 papers scheduled for presentation only 15 were presented.

In case of wheat, isoproturon was reported to be an effective herbicide. The work done at HAU, Hissar indicated that earlier application of isoproturon, not beyond 4-leaf stage of *Avena ludoviciana* and the 6-leaf stage of *Phalaris minor*, resulted in better weed control. Addition of a surfactant to isoproturon, applied postemergence, improved control of resistant broadleaf weeds in wheat. More frequent irrigations to the wheat crop improved the performance of isoproturon.

Work done at Coimbatore indicated that isoproturon, methabenzthiazuron and 2,4-D were effective against *Trianthema monogyna* in wheat.

Work done at HAU, Hissar on the competitive ability of the weeds associated with wheat indicated that leaf area and leaves per plant of *Phalaris minor* were higher than wheat when the crop was planted upto end November. *Avena ludoviciana* outgrew wheat in terms of dry matter production beyond its 5-6-leaf stage. In case of wheat sown beyond 10-15 November, the competitive ability of *Chenopodium album* was reduced as evident from its dry weight. The leguminous weed *Lathyrus aphaca* could withstand late sowing upto 15 January as seen from its seed producing ability.

Work done at Pantnagar indicated that although in wheat planted upto late December the density of *Phalaris minor* was significantly lower than in the earlier planted wheat, the grain yield of wheat was adversely affected, indicating that late planting of wheat was no substitute to good control of *Phalaris minor*.

In case of weed control in maize, reported from Anand, optimum level of fertilizers combined with the use of atrazine 2 kg/ha was the most effective treatment for obtaining highest grain yield of maize.

In pearl millet, *Trianthema* spp., a predominant weed, with its infestation upto 20 to 40 days after planting, caused significant reduction in the grain yield thus confirming that early removal of weeds was essential to obtain good grain yields.

In a study on the compatibility of soil applied herbicide like atrazine and insecticide like carbofuran, it was found that such combinations neither effect the performance of these products nor lead to higher soil residues.

In case of sorghum, as reported from Rajendranagar, Hyderabad, the number of weed species was not influenced by the level of nitrogen used, but the density of *Trianthema monogyna* increased with an increase in nitrogen level. However, there was a decrease in case of sedges and grasses.

3. Weed control in Pulses and Oil seeds.

Chairman : Dr. J.T. Nanker
Rapproteurs: Dr. A.N. Tiwari
Dr. P.A. Sarker

Out of the 24 papers listed in the abstracts only two were presented. At PKV, Akola, maximum economic return in greengram was reported with the application of fluchloralin 0.96 kg/ha.

In castor, it was observed that severity of weed competition was from 15-45 days after sowing and hence keeping the crop weedfree during this period was very important.

The session felt that special emphasis should be given on weed control in pulses and oilseeds in order to increase yield levels of these crops.

4. Weed control in Vegetables and Fruit Crops.

Chairman : Dr. Jai Prakash.
Rapporteurs : Dr. S.P. Singh
Dr. S.M. Kondap.

In this session work on eleven different vegetables, spices and fruit crops such as potato, onion, tomato, brinjal, turmeric coriander and fruit crops like grapes and mango were covered.

From the work done at Pantnagar and Allahabad, it was concluded that weed cause upto 51% yield loss in potato. Amongst herbicides methabenzthiazuron 1.5-2.0 kg/ha, linuron 1.0-1.5 kg ha and pendinethalin 0.75-1.5 kg/ as preemergence and diclofopmethyl 1.0-1.5 kg/ha as postemergence gave good weed control and higher tuber yield.

In brinjal, application of pendimethalin and fluchloralin 1 kg/ha, butachlor 1.5 kg/ha five days after planting gave control of some weeds only. None of the herbicides controlled all the weeds found in the field.

In Garlic, oxadiazon 0.75 kg/ha oxyfluorfen 0.24 kg ha fluchloralin 0.9 kg/ha and methabenzthiazuron gave yields comparable to weed-free conditions.

In turmeric, oxyfluorfen 1.5 kg/ha was found to be best followed by oxadiazon 1.0 kg/ha, fluchloralin 1.5 kg/ha and pendimethalin 1.0 kg/ha.

In coriander, fluchloralin 0.9 kg/ha was found to be better than oxadiazon @ 0.75 kg/ha.

In mango nursery, herbicides needed further testing because the herbicides tested at different rates were toxic to mango seedlings.

For weed control in grape nursery, diuron and atrazine 2 & 3 kg/ha proved effective and no phytotoxic injury was observed in the sprouted cuttings. More tests are required to confirm the optimum rates of these herbicides.

5. Weed Control in Commercial, Medicinal and Forage Crops.

Chairman : Dr. J.T. Nankar
Rapporteur : Dr. G.L. Bansal.

The session included 16 papers and but only six papers were presented. In cumin, oxadiazon 1.0 kg/ha gave highest net return. It was reported that on *Matricaria* sp. (an essential oil plant) oxyflourfen 0.5 kg/ha gave best weed control.

In another study in *Cymbopogon sp,* organic mulch was most effective in controlling the weeds.

In another work, it was shown that in forage sorghum, the highest yield was recorded in hand weeded plots and next in atrazine 1.5 kg/ha treatment.

6. Soil Residues, Soil Microflora, Physiology and Allelopathic effects.

Chairman : Dr. V.N. Saraswat.
Rapporteurs : Dr. (Miss) Rama
Dr. J.N. Singh.

In this session out of the 17 papers listed for presentation, only 10 papers were presented.

A. Alleopathic potentials.

Bioassay of petroleum ether, chloroform and ethylacetate extracts revealed the presence of inhibitors of seed germination and seedling growth in all fractions, with very pronounced inhibition by chloroform and water extracts. Germination was not affected by petroleum ether extracts.

B. Soil residues

In bioassay methods cucumber was found to be sensitive to fluchloralin at (1.0) kg/ha), oxadiazone (0.5 to 1.5 kg/ha), oxyfluorfen (0.1 to 0.2 kg/ha) and pendimethalin (1.25 kg/ha) residues.

Estimation of atrazine residue in grain and straw of sorghum and finger millets through spectrophotometric method revealed that at higher levels atrazine application (at 0.5 and 1.0 kg/ha) the residues were detectable. However the quantities of residues were below the tolerance level.

At 0.5 kg/ha, atrazine persisted in soil and had phytotoxic effects on succeding crop like blackgram, moong, cowpea, pigeon pea, sunflower, mustard and cotton. Maize and sorghum were tolerant to atrazine residues.

C. Soil microflora

Application of graded dose of F.Y.M. fertilizers and atrazine initially reduced the microbial population but promoted some in the later part of crop growth in sandy loam soil of Gujarat.

Terbutryn, methabenzthiazuron and pendimethalin had no significant effect on total count of fungi, bacteria or actinomycetes estimated at different intervals after spray in gram. Methabenzthiazuron (1.5 kg/ha) reduced the actinomycetes population significantly in lentil.

D. Physiology

Peas detected alachlor residues up to 0.00001 ppm in solution culture and blaekgram 0.001 ppm in soil culture, Alachlor persisted in soil for 30 days in sandy loam soils under Bangalore conditions.

7. Weed Biology and Ecology.

Chairman : Dr. R.K. Malik
Rappoteurs : Dr. R.B. Patel
Dr. J.P. Tiwari.

In this session 13 papers were presented out of the 29 listed papers. A critical view point on variation in weedflora in relation to environmental conditions in different zones of Kashmir valley was pattern of some problem weeds from Haryana and Himachal Pradesh. Possibilities of fitting such results in evolving some cultural methods of weed control were discussed. Some important weed species of medicinal value were surveyed in the forest of Sonpur in Madhya Pradesh.

The frequency of various weed seed contamination in wheat was discussed and the importance of preventive measures like sowing of clean seed and rogueing of escapees was thought to be necessary along with chemical weed control.

For the control of *Lantana camara,* combination of glyphosate 2 kg/ha$HgCl_2$ + 2,4 dinitrophenol were suggested from Palampur, H.P.

In Gujarat during the survey 41 weed species belonging to 18 families were encountered in crop Zone II-Residual soil-Cotton Zone.

The discussion in this session showed clearly that as a consequence of modern farming there is a change in the spectrum of weed species.

With the change in cropping pattern, fertilizer use pattern, irrigation facilities and village practices there is continuous change in weedflora. Moreover, the long term use of selective herbicides over the years cannot even exclude the possibility of change in weed flora and development of tolerance of weeds to herbicides.

In this context, long term studies on the following may be warranted.

a) Changes in weedflora due to changes in cropping pattern and increased use of inputs like fertilizer and irrigation.

b) Studies on the tolerance of individual weed species to herbicides.

c) Studies on the introduction of occassional change in the herbicides or use of combination to counteract the development of tolerant weeds.

d) Prevention of late weed occurance in order to increase the long term efficiency of herbicides.

e) Studies on seed biology of most important arable weeds in a particular zone should include number of seeds per plant, duration of ripening from the moment of initiation of flowering, and seed dormancy in relation to endogenous and exogenous factors.

f) Periodicity of weed germination should be thoroughly studied before making a rational use of control methods.

g) Effect of various climatic factors like temperature, relative humidity and rain fall just before and after applying herbicides in relation to their effect of growth of weeds.

8. Weed Competition, Problematic Weeds and Aquatic Weed Control.

Chairman : Dr. C.M. Singh

Rapporteurs : Dr. J.T. Nankar

Dr. J.P. Tiwari

Out of the 27 papers listed for presentation seven of them were presented on different aspects. Four papers were on crop-weed competition, on rice, guar, groundnut and maize+soybean system.

In rice, competition between rice seedlings and *Echinochloa* was studied. There was 20% and 37% reduction in grain yield of rice when 1 and 2 barnyard grass seedlings per hill respectively were present. The most critical period of crop weed competition in *guar* crop was 20 to 50 days after seeding. In maize+soybean cropping system under Himachal conditions, it was noted that keeping weed free condition upto 30 days after sowing signifiantly increased the maize equivalent yield. Thus, it is established that in maize+soybean intercropping also, weeds should be kept under control upto 30 days after sowing and after this the smothering effect of soybean takes care of weeds.

One paper on *Typha* control was presented and the findings indicated that this weed can be controlled effectively by using the mixture of paraquat & 2,4-D sodium salt (1.5 kg/ha + 5.00 kg/ha) The paper generated a lot of interest and the group was of the opinion that due care should be taken while using paraquat on aquatic weeds because this is harmful for aquatic flora and fauna.

A paper reporting the influence of water depth on aquatic algal weed "*Chara*" was presented. The depth of water had significant effect on growth of this weed. It has been found that while germination capacity of the weed remained unaffected by level of water, the biomass accumulation was adversely affected because a water depth of 5 to 100 cm has a limiting influence on the apical growth of this weed.

One paper was presented on control of winter population of *Parthenium hysterophorus*. The *Parthenium* seedlings were controlled effectively by 2,4-D Na salt 1.0 and 1.5 kg/ha, 2,4-D ester salt 1.0 kg/ha, common salt 10% and 15% solution and isoproturon 1.0 kg/ha. Use of common salt below 10% resulted in regeneration of the seedlings.

In cumin it was indicated if one hand weeding is to be carried out, it should be between 15 and 30 days and if two weedings are to be resorted to, they should be on 15th and 30th day after sowing.