

## 6. Weed Control of Mungbean Field under Furrow Irrigation (1980)

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In the Experiment II-5, it was proved that two times of manual weeding in the second and fourth weeks after planting mungbean could control weeds fairly well without affecting the grain yield so much. This experiment intended to examine the weed control effects of rice straw mulch and herbicide application as compared with the manual weeding mentioned above.

### Material and Method

1. Variety: SPR No.1
2. Treatment:
  - 1) Non-removal of weeds
  - 2) Manual weeding: twice of weeding by using a spade in the second and fourth weeks after seeding.
  - 3) Rice straw mulch: the field was mulched with rice straw of 6 ton/ha after sowing mungbean.
  - 4) Alachlor (herbicide) application: alachlor (2-chloro-2', 6'-diethyl-N-(methoxy-methyl) acetanilide)\* was applied in water solution on the next day of the seeding; 15 gram of the active ingredient was solved in 8 litre of water to spray upon every 100 square meters.
3. Experimental layout and plot size:
 

Randomized block design with 4 replications was employed; the size of a plot was 15 m<sup>2</sup> (3 m × 5 m).
4. Seeding time: January 3, 1980
5. Fertilizer application: N: 20, P<sub>2</sub>O<sub>5</sub>: 50, K<sub>2</sub>O: 50 (kg/ha)
6. Spacing: 75 cm × 20 cm (2 plants/hill)
7. Irrigation: furrow irrigation with 2 week intervals at the rate of approximately 5 mm/day.
8. Harvest: the matured pods were collected by hands in three times, on 19 and 27 March and 7 April.

### Result

1. Soil moisture content was higher in the plots of manual weeding and rice straw mulch than in the non-removal plot (Table 6-1).
2. Standing percentage of mungbean plant was more than 90% except the alachlor plot in which injuries were caused by this chemical in some block located near the water outlet of the field lot (Table 6-2).
3. Mungbean grew best differentiating more branches in the manual weeding plot; it grew well in early growth stage in the rice straw mulch plot, but rather in excess and spindly in the non-removal plot (Table 6-2).

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\* Commercial name is "Lasso"

4. The weeds in the field were mostly composed of jungle rice (*Echinochloa colonum* ((L.) Link); others were common sedge (*Cyperus iria* L.) and rice which originated from threshed grains of the preceeding crop. In the manual weeding plot, these weeds were mostly controlled by the twice of weeding but another weeds came out with the maturity of mungbean pods; in the rice straw mulch plot, weeds were well controlled in the early growth stage but later they appeared passing through the mulch. Thus, the amount of weeds were around 40% and 80% of those of non-removal plot in the former and latter plots, respectively at the final harvest of mungbean. On the other hand, the effects of weed control lasted longer in the alachlor plot (Table 6-3).
5. There were significant differences among the grain yields of the plots. The manual weeding plot yielded the highest followed by the rice straw mulch which yielded closely to the former. The alachlor treatment caused some injuries resulting in lower yield than the rice straw mulch in spite of its higher efficiency in weed control (Table 6-4). There was a negative correlation between the grain yields and the amount of weeds at mungbean harvest ( $r=-0.746^{**}$ , significant at 1% level) (Fig. 6-1).
6. Judging from the results mentioned above, rice straw mulch most likely is the best way for weed control from the practical points of view in dry season culture of upland crops in paddy field under irrigated condition.

**Table 6-1. Soil moisture content**

Treatment	1st Block	3rd Block
	%	%
Non-removal	13.5	12.4
Manual weeding	17.0	15.4
Rice straw mulch	16.4	15.6

Remarks: Soil moisture was determined on Feb. 28, 1980, one day before the irrigation (2 weeks after last irrigation). Soil samples were taken from the middle of ridges at the depth of 3–5 cm.

**Table 6-2. Growth of mungbean**

Treatment	2 weeks AS	6 weeks AS		12 weeks AS		no. of node
	Standing %	Main stem height	Leaf no.	Main stem height	no. of branch	
	%	cm		cm		
Non-removal	93.2	16.1	3.2	59.2	0.6	10.9
Manual weeding	92.5	13.1	3.5	58.2	0.9	9.9
Rice straw mulch	95.4	18.3	3.7	58.6	0.8	9.8
Alachlor appl.	89.5	15.8	3.5	55.6	0.7	9.6
L S D	ns	2.3	0.3	ns	ns	0.3

Remarks: 1) AS means after seeding.  
2) Leaf age and no. of node were checked at main stems.

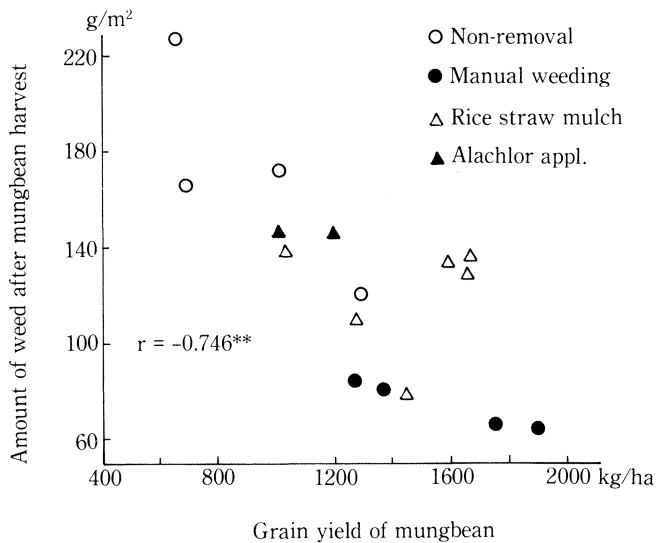
**Table 6-3. Amount of weeds at mungbean harvest (g/m<sup>2</sup>)**

Treatment	Jungle rice	Rice	Others	Total
Non-removal	157.2	8.1	6.9	172.2
Manual weeding	67.7	2.1	5.1	74.9
Rice straw mulch	124.8	9.5	0.7	135.0
Alachlor appl.	109.5	9.6	0	119.1
L S D	35.8	ns	ns	36.7

**Table 6-4. Yield and yield components of mungbean**

Treatment	Grain yield	Pod weight	Stem & leaf weight	Weight of 100 grains	No. of grains per pod
	t/ha	t/ha	t/ha	g	
Non-removal	0.93	0.29	1.21	8.1	14.1
Manual weeding	1.59	0.45	1.99	8.4	14.5
Rice straw mulch	1.50	0.46	1.72	8.1	14.5
Alachlor appl.	1.23	0.38	1.39	8.3	14.4
L S D	0.29	0.03	0.25	ns	ns

Remarks: Grain yield and pod weight are the total of 3 times harvest. They are based on 12% of moisture content while stem & leaf weight is on 40%.

**Fig. 6-1. Correlation between mungbean yield and amount of weeds**