

and whereas it was only 40 man days ha<sup>-1</sup> yr<sup>-1</sup> under CCS thus generating an additional employment of 113 man days ha<sup>-1</sup> yr<sup>-1</sup> under IFS.

It can be concluded that by adopting integrated farming with cropping and goat rearing under dry lands will greatly enhance income of the small and marginal farmers.

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## EFFECT OF TIME OF NITROGEN APPLICATION, METHODS OF WEED CONTROL AND SOWING ON YIELD AND ECONOMICS OF MAIZE

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#### ABSTRACT

Field experiments were conducted at the Agricultural College and Research Institute, Coimbatore to study the yield and economics of methods of weed control (hand weeding twice at 20 and 40 days after sowing (DAS), atrazine pre-emergence spray @ 0.5 kg a.i./ha) and sowing (direct seeding and transplanting maize with 5 day old seedlings) and time of nitrogen application and their combined influence. Hand weeding twice at 20 and 40 DAS, transplanting of 5- day-old seedlings and application of nitrogen in three splits as 25% basal + 50% at knee high stage + 25% at tasseling stage recorded significantly higher yields, gross returns, net returns and benefit cost ratio.

**KEY WORDS:** Nitrogen, Weed Control, Sowing, Maize, Yield, Economics.

Increasing productivity per unit area through agronomic management is one of the important solutions to increase production of maize (*Zea mays* L.) grain. Keeping this view, an attempt was made to study the effect of methods of weed control, sowing and time of nitrogen application in yield and economic returns of maize.

#### MATERIALS AND METHODS

The field experiment was conducted during *kharif* and *rabi* 1986-87 under irrigated conditions at the Agricultural College and Research Institute, Coimbatore. The soil of the experimental site was clay loam with a pH, 8.3 and 0.8 m.mhos cm<sup>-1</sup> EC. The experiment was laid out in split plot design, methods of weed control (W<sub>1</sub> - hand weeding twice at 20 and 40 DAS; W<sub>2</sub> - atrazine pre-emergence spray @ 0.5 kg ai/ha) and sowing methods (S<sub>1</sub> - direct seeding, S<sub>2</sub> - transplanting 5 - day-old seedlings) in main plots and time of nitrogen

application (T<sub>1</sub>-25% basal + +50% at knee high + 25% at tasseling; T<sub>2</sub>-25% at knee high + 50% at grand growth + 25% at tasseling; T<sub>3</sub>-50% at knee high + 50% tasseling; T<sub>4</sub>-25% knee high+ 50% at grand growth +5% as foliar spray at tasseling; T<sub>5</sub>-50% at knee high + 25% at grand growth + 25% at tasseling) in sub plots. CO 1 variety was sown at a spacing of 60 x 20 cm, nitrogen was applied @ 120 kg/ha as per treatment except in T<sub>4</sub> where 96 kg N/ha was applied. Phosphorus and potassium were applied @ 60 kg P<sub>2</sub>O<sub>5</sub> and 10 kg K<sub>2</sub>O/ha respectively. Atrazine was applied @ 0.5 kg a.i/ha on the third day of sowing.

#### RESULTS AND DISCUSSION

##### Weed control methods

Hand weeding twice at 20 and 40 DAS recorded significantly higher grain yield (Table 1), gross returns, net returns and net return per rupee invested than atrazine spray in *kharif* and *rabi*

**Table 1.** Influence of methods of weed control, sowing and time of nitrogen application on yield and economics

Treatment	Kharif			Rabi			
	Yield (Q/ha)	Net Returns (Rs./ha)	Net return per rupee invested	Yield (Q/ha)	Net returns (Rs/ha)	Net return per rupee invested	
<b>Weed control</b>							
W <sub>1</sub>	58.24	6196	1.57	54.86	5132	1.24	Value of urea
W <sub>2</sub>	55.60	4651	1.26	49.13	4622	1.18	N-Rs.5.06/kg.
S.Ed	0.97	-	-	1.13	-	-	Value of atrazine
C.D (0.05)	2.37	-	-	2.76	-	-	Rs.80/-kg
<b>Sowing methods</b>							
S <sub>1</sub>	52.54	5160	1.31	47.26	4001	0.96	Value of grain
S <sub>2</sub>	61.30	6624	1.65	56.75	5596	1.33	Rs.2.05/kg.
S.Ed	1.92	-	-	2.29	-	-	Value of straw
C.D (0.05)	4.69	-	-	5.62	-	-	Re.0.12/kg.
<b>Time of nitrogen application</b>							
T <sub>1</sub>	58.70	6334	1.61	54.50	5275	1.25	
T <sub>2</sub>	56.80	6000	1.58	52.10	4814	1.21	
T <sub>3</sub>	56.90	6005	1.58	52.00	4938	1.23	
T <sub>4</sub>	54.30	5776	1.57	49.50	4678	1.20	
T <sub>5</sub>	56.90	6061	1.59	51.90	4948	1.23	
S.Ed	1.18	-	-	1.82	-	-	
C.D (0.05)	2.42	-	-	3.72	-	-	

seasons respectively. Similar results were also reported earlier (AICRPWC, 1983; Srinivas, 1987).

### Sowing methods

Transplanting of 5-day old seedlings resulted in higher grain yield, higher gross returns and higher net returns than direct seeded maize in both the seasons of *kharif* and *rabi* respectively. This is in accordance with the findings of Ibrahim (1987).

### Time of nitrogen application

The yield (58.7 and 54.5 Q/ha), gross returns (Rs.10274/- and Rs.9425/-) net returns (Rs.6334/- and Rs.5275/-) and net return per rupee invested (Rs.1.61 and 1.25) were higher in treatment T<sub>1</sub> which received basal dose of nitrogen than all other treatments in both the seasons of *kharif* and *rabi*. The treatment (T<sub>4</sub>) which had 5 per cent of nitrogen as foliar spray at tasseling stage is comparable in *rabi* season with other treatments.

Positive interaction effect was obtained between weed control, sowing and time of nitrogen

application. The treatment combination of hand weeding twice at 20 and 40 DAS in combination with transplanting 5 day old seedlings and nitrogen application in three splits (25% based + 50% knee high + 25% at tasseling) recorded higher gross returns (Rs.10586 and Rs.9529 /ha), net returns (Rs.6576 and Rs.5309 /ha) and net return per rupee invested (Rs.1.64 and Rs.1.26) in both seasons respectively.

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