

**Annual Report of All India Coordinated Research Project on Sugarcane  
(Agronomy & Soil Science) for the year 2011-12  
Centre- Uchani (Karnal)**

- AS 42** : **Agronomic evaluation of promising new sugarcane genotypes.**
- Objectives** : To work out agronomy of sugarcane varieties from advanced varietal trial
- Year of start** : 2010-11 (Continued with new genotypes)
- Treatments** :
- A. Genotypes** – 6 (Three in early and four in mid-late groups in separate trials)
- i) Early : CoPk 5191, CoLk 5201 and CoH 5265
  - ii) Mid-late : CoH 135, Co 05011 and Co Pant 05222
- B. Fertility levels** - 3
- i) 75% of recommended doses of N
  - ii) 100% of recommended doses of N
  - iii) 125% of recommended doses of N

The trial was conducted on early and mid late sugarcane varieties as mentioned above in Factorial RBD with three replications. The crop was planted at 75 cm row spacing March 5, 2011. The soil of the experimental field was clay loam in texture having pH 7.8, EC 0.4  $\text{dsm}^{-1}$ , organic carbon 0.36%, available P 12.5 kg/ha and available K 180 kg/ha. Recommended doses of phosphorus (50 kg  $\text{P}_2\text{O}_5/\text{ha}$ ) and potash (50 kg  $\text{K}_2\text{O}/\text{ha}$ ) were applied at the time of planting whereas nitrogen as per treatments was applied in three equal splits. The crop was irrigated at 8-10 days intervals during pre-monsoon period and 20 days interval during post monsoon period. The harvesting of the experiment was done on February 3, 2012.

Among early group varieties there was no significant difference in germination percent, tillers and millable canes (Table 1). Variety CoPk 5191 produced significantly highest single cane weight and cane yield. CoH 5265 and CoLk 5201 were found at par in terms of cane weight and cane yield. Recommended and 25 % higher doses of N being at par recorded significantly higher number of tillers, millable canes and cane yield over 75% of recommended dose of N.

The data presented in Table 2 revealed that among the mid-late group varieties there was no significant difference in germination percent, tillers and millable canes. Variety CoH 135 produced significantly highest single cane weight and cane yield (Table 2). CoP 5222 and Co 05011 were found at par in terms of all growth characters and cane yield. Recommended and 25 % higher doses of N being at par recorded significantly higher number of tillers, millable canes and cane yield over 75% of recommended dose of N.

**Summary:**

Among early group varieties CoPk 5191 produced significantly highest single cane weight and cane yield (70.6 t/ha). CoH 5265 and CoLk 5201 were found at par in terms of growth and cane yield. Among mid group varieties, CoH 135 produced significantly highest single cane weight and cane yield (84.8 t/ha). All the varieties of both the maturity group responded up to recommended dose of nitrogen.

**Table 1: Effect of different fertility levels on growth, yield and quality of early group varieties at Uchani (2011-12)**

Treatments	Germination (%)	No. of tillers (000/ha)	No. of millable canes (000/ha)	Single cane weight (g)	Cane yield (t/ha)
<b>Genotypes</b>					
CoPk 5191	44.3	118.4	86.0	822	70.6
CoLk 5201	43.5	114.2	83.9	793	65.6
CoH 5265	44.1	113.2	83.2	815	66.9
CD at 5%	NS	NS	NS	27	2.8
<b>Nitrogen dose</b>					
75% of Recom. N*	44.3	104.4	75.6	782	58.5
100 % of Recom. N	43.8	118.4	86.7	823	71.1
125% of Recom. N	43.7	123.0	90.8	825	73.5
CD at 5%	NS	6.4	4.3	27	2.8

\* Recommended N - 150 kg /ha

**Table 2: Effect of different fertility levels on growth, yield and quality of mid- late group varieties at Uchani (2011-12)**

Treatments	Germination (%)	No. of tillers (000/ha)	No. of millable canes (000/ha)	Single cane weight (g)	Cane yield (t/ha)
<b>Genotypes</b>					
CoH 135	45.0	134.3	93.8	912	84.8
Co 05011	44.2	130.1	92.6	851	78.2
CoPant 05222	45.3	131.2	93.5	858	79.5
CD at 5%	NS	7.7	NS	35	3.2
<b>Nitrogen dose</b>					
75% of Recom. N*	45.2	124.4	87.5	843	73.1
100 % Recom. N	44.8	134.0	95.0	887	83.5
125% of Recom. N	44.4	137.2	97.4	890	85.9
CD at 5%	NS	7.7	4.6	35	3.2

\* Recommended N - 150 kg /ha

## **AS-61: Optimizing irrigation schedule in sugarcane under different planting methods**

**Objective:** To enhance water and crop productivity in sugarcane

**Year of start:** 2009-10

### **A. Planting method: 3**

1. Conventional planting at 75 cm row spacing
2. Paired row planting at 30: 120 cm row spacing
3. FIRB method at 75 cm row spacing

### **B. Irrigation schedule (IW/CPE ratio)**

1. 0.50
2. 0.75
3. 1.00

**Results achieved:** Sugarcane variety CoH 151(late maturing) was planted by different planting methods on Feb. 24, 2011 in factorial randomized block design with three replications during spring season. The soil of the experimental field was clay loam in texture having pH 8.0, EC 0.4 dsm<sup>-1</sup>, organic carbon 0.35%, available P 12 kg/ha and available K 180 kg/ha. Recommended doses of phosphorus (50 kg P<sub>2</sub>O<sub>5</sub>/ha) and potash (50 kg K<sub>2</sub>O/ha) were applied at the time of planting whereas nitrogen (150 kg N/ha) was applied in three equal splits. Irrigation were given as per treatment i.e. based on different IW/CPE ratio up to first week of July and later on all the plots were irrigated at 20 days intervals up to harvest. The crop was harvested in on Jan. 7, 2012.

Higher germination was recorded under FIRB planting method. Number of tillers, millable canes and single cane weight were not affected significantly by different planting methods (Table 3). Among different planting methods, paired row planting recorded significantly highest cane yield. Conventional and FIRB planting were found at par in terms of cane yield.

Irrigation at IW/CPE ratio of 1.0 and 0.75 being at par produced significantly higher number of tillers, millable canes and cane yield as compared to IW/ CPE ratio of 0.50 (Table 3 ).

### **Summary:**

Paired row planting (79.6 t/ha) gave highest cane yield. However, irrigation schedule at IW/CPE ratio of 1.0 and 0.75 being at par produced significantly higher number of tillers, millable canes and cane yield over IW/ CPE ratio of 0.50.

**Table 3: Effect of different method of planting and irrigation intervals on growth and yield of sugarcane at Uchani (2011-12)**

Treatments	Germination (%)	No. of tillers (000/ha)	No. of millable canes (000/ha)	Single cane weight (g)	Cane yield (t/ha)
<b>Planting methods</b>					
Conventional	46.6	124.2	95.2	802	75.9
Paired row	48.3	127.4	98.1	815	79.6
FIRBS	49.7	123.0	93.3	799	74.2
CD at 5%	2.0	NS	NS	NS	2.3
<b>Irrigation schedule (IW/CPE ratio)</b>					
0.50	48.0	104.2	88.4	722	63.3
0.75	48.2	132.6	97.9	846	82.2
1.00	48.4	137.8	100.2	847	84.2
CD at 5%	NS	7.2	5.3	42	2.3

**AS-62: Management of binding weeds in spring planted sugarcane**

**Objective:** To control binding weeds/creeper in sugarcane

**Year of start:** 2009-10

**Treatments:**

T<sub>1</sub>- Control (weedy check)

T<sub>2</sub>- Hoeing at 30, 60 and 90 DAP

T<sub>3</sub>- Atrazine at 2 kg /ha (PE) followed by 2, 4-D Na salt (1 kg /ha) at 60 DAP

T<sub>4</sub>- Atrazine at 2 kg /ha after 1<sup>st</sup> irrigation & hoeing fb by 2, 4-D Na salt(1.0 kg/ha) at 75 DAP

T<sub>5</sub>- Metribuzin at 1.25 kg /ha (PE) followed by 2, 4-D Na salt at 1.0 kg/ha at 75 DAP

T<sub>6</sub>- Atrazine at 2 kg /ha (PE) + Almix 20 g/ha at 75 DAP

T<sub>7</sub>- Metribuzin at 1.25 kg /ha (PE) + Almix 20 g/ha at 75 DAP

T<sub>8</sub>- Atrazine at 2 kg /ha (PE) + Ethoxysulfuron 50 g at 75 DAP

T<sub>9</sub>- Atrazine at 2 kg ha (PE) + Dicamba 350 g /ha at 75 DAP

T<sub>10</sub>- Metribuzin at 1.25 kg /ha (PE) + Dicamba 350 g. /ha at 75 DAP

**Results achieved:**

The sugarcane variety CoH 110(late maturing) was planted at 75 cm spacing on Feb.28, 2011. The trial consisting of ten treatments as mentioned in Table 4 was conducted in randomized block design with three replications in spring season. The crop was harvested on Jan. 5,2012.

Atrazine at 2.0 kg /ha after 1<sup>st</sup> irrigation & hoeing fb by 2, 4-D at 75 DAP (T<sub>4</sub>) was found best treatment amongst different herbicidal treatments for control of complex weed flora including *Ipomea species* (Table 5). Highest and lowest weed number and weed dry matter was recorded in untreated control and three hoeing, respectively.

Treatments involving atrazine as pre emergence followed by post emergence application of 2, 4-D or Dicamba or almix being at par gave excellent control of *Ipomea species* as well as other grassy weeds as compared to treatments of metribuzin applied pre-emergence in combination with these post emergence herbicide. Among pre-emergence herbicides atrazine produced significantly lower weed dry matter and weed density as compared to metribuzin. Ethoxysulfuron was found least effective chemical treatment for controlling *Ipomea spp.*

Treatments T<sub>2</sub> and T<sub>4</sub> being at par produced significantly higher number of tillers, millable canes and cane yield as compared to rest of the treatments. Atrazine 2.0 kg /ha applied after hoeing at 1<sup>st</sup> irrigation fb by 2, 4-D at 75 DAP (T<sub>4</sub>) was found best treatment amongst different herbicidal treatments. Lowest number of tillers, millable canes and cane yield was recorded in untreated control. Treatments involving atrazine as pre emergence followed by post emergence application of 2, 4-D or Dicamba or almix being at par produced significantly higher number of tillers, millable canes and cane yield as compared to metribuzin as pre emergence followed by post emergence application of 2, 4-D or Dicamba or almix. Amongst herbicidal combination, treatment T<sub>8</sub> i.e. atrazine followed by ethoxysulfuron was found to gave lowest number of tillers, millable and cane yield.

**Summary:** Application of atrazine at 2.0 kg /ha after hoeing at 1<sup>st</sup> irrigation followed by 2, 4-D at 75 DAP (T<sub>4</sub>) was found best treatment amongst different herbicidal treatments for control of complex weed flora including *Ipomea species*. Treatments involving atrazine as pre emergence followed by post emergence application of 2, 4-D or Dicamba or almix being at par produced significantly higher number of tillers, millable canes and cane yield as compared to metribuzin as pre emergence followed by post emergence application of 2, 4-D or Dicamba or almix

**Table 4: Effect of different treatments on weed number and weed dry matter in sugarcane at Uchani (2011-12)**

Treatment	Weed density (No./m <sup>2</sup> )				Weed dry matter (g/m <sup>2</sup> )			
	Cyperus	Grassy	Ipomea	Total	Cyperus	Grassy	Ipomea	Total
T <sub>1</sub> - control	42	70	17	129	11.2	133.1	121.4	265.7
T <sub>2</sub> - 3 hoeing	20	15	3	38	3.7	22.6	21.1	47.4
T <sub>3</sub> - Atrazine (PE) fb. 2, 4-D at 75 DAP	40	36	0	76	13.4	82.0	-	95.4
T <sub>4</sub> - Hoeing after 1 <sup>st</sup> Irrig. + Atrazine fb. 2, 4-D	35	17	0	52	9.1	42.3	-	51.4
T <sub>5</sub> - Metribuzin(PE) fb. 2, 4-D at 75 DAP	45	47	0	93	11.3	96.1	-	107.4
T <sub>6</sub> - Atrazine (PE) fb. Almix at 75 DAP	42	34	0	76	11.0	72.4	-	83.4
T <sub>7</sub> - Metribuzin(PE) fb. fb. Almix at 75 DAP	47	45	0	92	11.6	95.3	-	106.9
T <sub>8</sub> - Atrazine (PE) fb. Ethoxy at 75 DAP	30	41	7	78	8.6	92.0	42.6	143.2
T <sub>9</sub> - Atrazine (PE) fb. Dicamba at 75 DAP	44	34	0	78	10.8	81.3	-	92.1
T <sub>10</sub> - Metribuzin(PE) fb. Dicamba at 75 DAP	46	43	0	89	11.2	94.4	-	105.6

**Table 5: Effect of different treatments on yield and yield attributing characters at Uchani (2011-12).**

Treatments	Germination (%)	No. of tillers (000/ha)	Millable canes (000/ha)	Cane weight (g)	Cane yield (t/ha)
T <sub>1</sub> - control	46.4	48.3	40.0	502	19.2
T <sub>2</sub> - 3 hoeing at 30, 60 and 90 DAP	49.3	122.6	86.3	928	78.6
T <sub>3</sub> - Atrazine (PE) fb. 2, 4-D at 75 DAP	48.1	107.2	76.2	845	63.9
T <sub>4</sub> - Hoeing after 1 <sup>st</sup> Irrigation fb Atrazine fb. 2, 4-D at 75 DAP	49.0	120.0	84.1	924	76.2
T <sub>5</sub> - Metribuzin (PE) fb. 2, 4-D at 75 DAP	47.8	98.4	68.0	825	55.7
T <sub>6</sub> - Atrazine (PE) fb. Almix at 75 DAP	48.6	102.1	76.3	848	63.9
T <sub>7</sub> - Metribuzin (PE) fb. Almix at 75 DAP	47.0	98.0	70.1	842	58.7
T <sub>8</sub> - Atrazine (PE) fb. Ethoxy at 75 DAP	47.6	96.2	67.6	803	53.9
T <sub>9</sub> - Atrazine (PE) fb. Dicamba at 75 DAP	47.2	103.3	74.5	852	62.8
T <sub>10</sub> - Metribuzin (PE) fb. Dicamba at 75 DAP	46.4	96.1	68.8	819	55.6
CD at 5%	NS	6.2	5.2	37	3.2

## **AS-64: Response of sugarcane to different plant nutrients in varied agro ecological situations**

**Objective:** To study differential response of sugarcane to different nutrients.

**Year of start:** 2011-12

### **Treatments:**

1. Control(No fertilizer)
2. N
3. NP
4. NPK
5. NPK + S
6. NPK + Zn
7. NPK + Fe
8. NPK+ Mn
9. NPK+ S + Zn
10. NPK+ S + Zn + Fe
11. NPK+ S + Zn + Fe + Mn
12. Soil test based fertilizer application

**Results achieved:** Sugarcane variety CoH 119 (Mid group) was planted March 25, 2011 at 75 cm spacing in randomized block design with three replications. The soil of the experimental field was clay loam in texture having pH 8.7, EC 0.4 dsm<sup>-1</sup>, organic carbon 0.35%, available P 9.0 kg/ha and available K 183 kg/ha, available S(12.9 kg/ha), available Zn (0.57ppm)and available Fe(3.7ppm) and available Mn (8.5ppm). Recommended doses of phosphorus (50 kg P<sub>2</sub>O<sub>5</sub>/ha), potash (50 kg K<sub>2</sub>O/ha) and Sulphur (60 kg/ha) were applied at the time of planting whereas recommended dose of nitrogen (150 kg N/ha) was applied in three equal splits as top dressing (April, May & June). Zinc, Fe and Mn were applied thrice (April, May & June) as foliar spray. The crop was irrigated at 8-10 days intervals during pre-monsoon period and 20 days interval during post monsoon period. The crop was harvested on Jan.4, 2012.

The application of N over control, NP over N alone, NPK over NP, and NPKS over NPK significantly increased cane yield. The application of individual micronutrient (Fe, Mn and Zn) in combination NPK did not significantly increased cane yield over NPK alone. However, the combined application of these micro nutrients significantly increased the cane yield over NPK alone (Table 6). There was slight

decline in available P in soil in control and only N treated plots. Similarly slight decrease in available K in soil was observed in control, N, NP treatments. K application in different treatments slightly increased the available K in the soil. There was no change in pH, EC, organic carbon (%) and available micronutrient status of the soil after harvest of sugarcane plant crop (Table 7).

**Summary:** The application of N over control, NP over N alone, NPK over NP, and NPKS over NPK significantly increased cane yield. The application of individual micronutrient (Fe, Mn and Zn) in combination NPK did not significantly increase cane yield over NPK. However, the combined application of these micro nutrients significantly increased cane yield over NPK alone.

**Table 6: Effect of different treatments on sugarcane growth and yield at Uchani (2011-12).**

Treatments	Millable canes (000/ha)	Cane yield (t/ha)	CCS (%)	Sugar Yield (t/ha)
Control(No fertilizer)	61.2	50.6	11.00	5.56
N	71.6	66.3	11.88	7.88
NP	74.3	77.5	12.32	9.55
NPK	77.1	91.8	12.58	11.55
NPK+S	79.5	97.7	13.11	12.81
NPK +Zn	77.2	93.4	12.64	11.81
NPK +Fe	77.5	94.6	12.59	11.91
NPK +Mn	77.3	93.0	12.62	11.74
NPK +S+Zn	80.0	99.7	13.20	13.16
NPK+S+Zn+Fe	80.9	102.6	13.65	14.00
NPK+S+Zn+Fe+Mn	81.5	103.5	13.76	14.24
Soil test based fertilizer application	77.4	92.4	12.54	11.59
CD at 5%	3.6	4.4	0.26	1.14

**Table 7: Effect of different treatments on soil properties at harvest at Uchani (2011-12)**

Treatments	pH	EC	OC	Available P(kg/ha)	Available K(kg/ha)	Available S (kg/ha)	Available Zn (ppm)	Available Fe (ppm)	Available Mn (ppm)
Control(No fertilizer)	8.7	0.40	0.35	8	180	12.7	0.57	3.7	8.5
N	8.7	0.40	0.35	8	179	12.7	0.57	3.7	8.5
NP	8.7	0.40	0.35	9	180	12.7	0.57	3.7	8.5
NPK	8.7	0.40	0.35	9	185	12.7	0.57	3.7	8.5
NPK+S	8.7	0.40	0.35	9	186	13.8	0.57	3.7	8.5
NPK +Zn	8.7	0.40	0.35	9	185	12.9	0.57	3.7	8.5
NPK +Fe	8.7	0.40	0.35	9	186	13.0	0.57	3.7	8.5
NPK +Mn	8.7	0.40	0.35	9	186	12.9	0.57	3.7	8.5
NPK +S +Zn	8.7	0.40	0.35	9	186	13.4	0.57	3.7	8.5
NPK +S + Zn+ Fe	8.7	0.40	0.35	9	184	13.7	0.57	3.7	8.5
NPK + S + Zn + Fe + Mn	8.7	0.40	0.35	9	186	14.0	0.57	3.7	8.5
Soil test based fertilizer application	8.7	0.40	0.35	9	184	12.9	0.57	3.7	8.5
Initial	8.7	0.40	0.35	9	183	12.9	0.57	3.7	8.5



**AS-65 : Enhancing sugarcane productivity and profitability under wheat sugarcane cropping system**

**Objective** : To enhance the productivity of sugarcane under wheat- sugarcane cropping system

**Year of start** : 2011 (autumn)

**Treatments:**

T<sub>1</sub>: Autumn planted sugarcane

T<sub>2</sub>: T<sub>1</sub> + Wheat (1:2)

T<sub>3</sub>: T<sub>1</sub> + Wheat (1:3)

T<sub>4</sub>: Wheat sown on 15<sup>th</sup> Nov. followed by sugarcane planting after wheat harvest

T<sub>5</sub>: Wheat sown on 15<sup>th</sup> Dec. followed by sugarcane planting after wheat harvest

T<sub>6</sub>: FIRB sowing of wheat 15<sup>th</sup> Nov. + Sugarcane in furrows in 3<sup>rd</sup> week of February

T<sub>7</sub>: FIRB sowing of wheat 15<sup>th</sup> Nov. + Sugarcane in furrows in 3<sup>rd</sup> week of March

T<sub>8</sub>: FIRB sowing of wheat 15<sup>th</sup> Dec. + Sugarcane in furrows in 3<sup>rd</sup> week of February

T<sub>9</sub>: FIRB sowing of wheat 15<sup>th</sup> Dec. + Sugarcane in furrows in 3<sup>rd</sup> week of March

**Results achieved:**

Sugarcane variety CoH 150 and wheat variety HD 2967 was planted as per treatment in different dates of planting in randomized block design with three replications. The soil of the experimental field was clay loam in texture having pH 8.2, EC 0.4 dsm<sup>-1</sup>, organic carbon 0.36%, available P 11 kg/ha and available K 170 kg/ha. Recommended doses of phosphorus (50 kg P<sub>2</sub>O<sub>5</sub>/ha) and potash (50 kg K<sub>2</sub>O/ha) were applied at the time of planting whereas nitrogen (150 kg N/ha) was applied in three equal splits in case of sugarcane crop Whereas for wheat crop full dose of phosphorus (60 kg/ha) and potash (60 kg/ha) were applied at the time of planting and nitrogen (150 kg/ha) was applied in two equal splits (21 and 42 days after sowing). Crops were irrigated as per the requirement of wheat crop upto harvesting of wheat and later on sugarcane was irrigated at 8-10 days intervals during pre-monsoon period and 20 days interval during post monsoon period. Wheat crop was harvested on April 15, 2012. Planting of sugarcane (after wheat harvest) in treatment T<sub>4</sub> and T<sub>5</sub> was done on April 22, 2012.

Wheat sown with autumn cane (Oct. 30, 2011) and 15<sup>th</sup> November on bed or by conventional method produced higher grain yield as compared to wheat sown on 15<sup>th</sup> December. Autumn planted cane recorded significantly higher germination as compared to spring and late planting (Table 8). Lowest germination was recorded in late planting of sugarcane after wheat harvest. Data on other characters will be submitted in annual report of 2012-13 after harvest of sugarcane crop.

**Summary:** Wheat sown with autumn cane (Oct. 30, 2011) and 15<sup>th</sup> November on bed or by conventional method produced higher grain yield as compared to wheat sown on 15<sup>th</sup> December. Autumn planted cane recorded significantly higher germination as compared to spring and late planting. Lowest germination was recorded in late planting of sugarcane after wheat harvest.

**Table 8: Effect of different treatments on wheat crop and germination of sugarcane crop at Uchani (2011-12).**

Sr. No.	Treatments	Wheat Grain yield (q/ha)	Sugarcane germination (%)
T <sub>1</sub>	Autumn planted sugarcane	---	50.3
T <sub>2</sub>	T <sub>1</sub> + Wheat (1:2)	60.5	48.3
T <sub>3</sub>	T <sub>1</sub> + Wheat (1:3)	59.2	49.2
T <sub>4</sub>	Wheat sown on 15 <sup>th</sup> Nov. followed by sugarcane planting after wheat harvest	58.0	36.1
T <sub>5</sub>	Wheat sown on 15 <sup>th</sup> Dec. followed by sugarcane planting after wheat harvest	50.5	35.2
T <sub>6</sub>	FIRB sowing of wheat 15 <sup>th</sup> Nov. + Sugarcane in furrows in 3 <sup>rd</sup> week of February	58.8	45.6
T <sub>7</sub>	FIRB sowing of wheat 15 <sup>th</sup> Nov. + Sugarcane in furrows in 3 <sup>rd</sup> week of March	57.3	49.5
T <sub>8</sub>	FIRB sowing of wheat 15 <sup>th</sup> Dec. + Sugarcane in furrows in 3 <sup>rd</sup> week of February	51.2	46.0
T <sub>9</sub>	FIRB sowing of wheat 15 <sup>th</sup> Dec. + Sugarcane in furrows in 3 <sup>rd</sup> week of March	50.3	48.6
	CD at 5%	1.8	2.7

**Summary of Experiments Conducted by Crop production group (Agronomy & Soil Science) at  
CCSHAU, RRS, UCHANI, KARNAL  
(2011-12)**

Following experiments were allotted during 2011-12 and all the allotted experiments were conducted

**AS 42: Agronomic evaluation of promising new sugarcane genotypes**

Among early genotypes (CoPk 5191, CoLk 5201 and CoH 5265), Co Pk 5191 gave highest cane yield (70.6 t/ha). Among nitrogen levels 100 and 125 % of recommended N being at par gave highest cane yield.

Among mid late genotypes (CoH 135, Co 05011 and Co Pant 05222), significantly highest cane yield (84.8t/ha) was recorded in CoH 135. Among nitrogen levels 100 and 125 % of recommended N being at par gave highest cane yield.

**AS-61: Optimizing irrigation schedule in sugarcane under different planting methods**

Paired row planting at 30:120 cm row spacing registered the maximum cane yield (79.6 t/ha). Scheduling irrigation at 1.0 or 0.75 IW/CPE ratios gave significantly higher number of tillers, millable canes and cane yield.

**AS-62: Management of binding weeds in spring planted sugarcane**

Atrazine at 2.0 kg /ha after 1<sup>st</sup> irrigation & hoeing followed by post emergence application of 2, 4-D Na salt at 75 DAP (T<sub>4</sub>) was found best treatment amongst different herbicidal treatments for effective weed control including *Ipomea species*.

**AS-64: Response of sugarcane to different plant nutrients in varied agro ecological situations**

The application of N over control, NP over N alone, NPK over NP, and NPKS over NPK significantly increased cane yield. The application of individual micronutrient (Fe, Mn and Zn) in combination NPK did not significantly increase cane yield over NPK. However, the combined application of these micro nutrients significantly increased cane yield over NPK alone.

**AS-65 : Enhancing sugarcane productivity and profitability under wheat sugarcane cropping system**

Wheat sown with autumn cane (Oct. 30, 2011) and 15<sup>th</sup> November on bed or by conventional method produced higher grain yield as compared to wheat sown on 15<sup>th</sup> December. Autumn planted cane recorded significantly higher germination as compared to spring and late planting. Lowest germination was recorded in late planting of sugarcane after wheat harvest.