The Journal of Rural and Agricultural Research Vol. 13 No. 2, 60-62 (2013)
Received December 2012; Acceptance August 2013

Increase Productivity of Sugarcane by Trench method planting along with SSNM techniques

A.K. KATIYAR, B.B. SINGH[1] AND RAKESH DIXIT[2]
Associate Director Soil Science, SVP Univ. KVK, Badaun

Abstract

The field demonstrations were conducted at 128 farmers' fields in District Pilibhit Uttar Pradesh having Tarai soil and atmospheric conditions in two consecutive seasons. All the farmers adopted trench method for planting of sugarcane during both the seasons and also were used site specific nutrient management (SSNM) formula.This formula was subsidized to farmers and ensures supply of all required nutrient from fertilizers. This method shows improved germination from 38 to 64 percent. The yield data were recorded on average of total demonstrations which were 1039 q/ha productivity.This was about to double productivity of the district.

Key words: trench method planting, SSNM, Sugarcane, Productivity, nutrient

Introduction

Sugar is the main house hold essential commodity of India, At National level Uttar Pradesh contributing 28 percent in sugar production from47 percent cropped area, which is very less compare to Maharashtra (area 17.5 percent and contribution 34 percent). where as productivity is only 584 q/ha compare to 710 q/ha from Maharashtra. Pilibhit District situated in the Tarai of Uttar Pradesh, which having potential of sugarcane productivity from1000 to 1250 q/ha. The Productivity is low mainly due to planting of sugarcane by old furrow method and also use of imbalance fertilizers. In view of harness this productivity potential of sugarcane Krishi Vigyan Kendra, Sugarcane Department and Sugar Factory join together and decide to improve productivity of the District. This purpose organized large scale demonstrations at farmer's fields. In this context, Planted sugarcane by trench method along with site specific nutrient management (SSNM) techniques on the basis of target yield 1000q/ha. Awareness campaigns were done through different extension methods. Trench methods of planting were used where tall varieties were grown and strong wind blow areas, Kiran Yaday (2009) and Jaiveer Singh (2010) also used micronutrient in production of sugarcane.

Materials and methods

Trenches were made U shape with the help of trenchers, 30 cm wide and 30 cm depth at adistance90 cm between two trenches. SSNM formula were decided on the basis of nutrient uptake by crop from target yield 1000q/ha as under:

Table 1: Nutrient uptake by sugarcane crop to produce target yield 1000 q/ha.

Nutrient	N	P	K	B	Sulphur	Iron	Zinc
Kg/ha	207.5	52.5	280	0.0625	40	4.0	1.25

The ensure supply of above nutrients, arranged fertilizers from local market. These fertilizers kits were supplied on subsidy basis to the farmers. Bokhtiar *et al* (2003) were also used NPK, S, Zn in sugarcane production 72.44 t/ha yield.

Time and method of fertilizers application:-

1. All NPK, Sulphur, Borax, Ferrous sulphate, Zinc sulphate were applied as basal application and mix with soil just before planted of sets in trench. Zinc sulphate mix with FYM just before application in the trench.
2. 30 kg Urea at 30-35 days after sowing (DAS)
3. 40 kg Urea, 30 kg MOP and 5 kg Mono zinc at 50-60 DAS
4. 45 kg Urea and 30 kg MOP at 90-100 DAS

Soaking of two budded sets in carbendazim or Baglal fungicidal solution up to 15-20 minutes just before sowing. Seeds were sown in trenches as end to end method (stair type manner) in 10 cm distance between two sets. After placement, covered these sets with 8-10 cm soil the help of spades manually.

Results and discussion

The 128 demonstrations were conducted at farmer's fields in two sugarcane planting season in 2008-09 and 2009-10 at all three AES zones of District, where soil is loamy to clay loam. The Economics of the district shows stagnation in productivity. In the year

[1]Deputy Cane Commissioner, Meerut Division- Meerut
[2]Deputy General Manager- Rupapur Sugar Factory, Hardoi

Table 2: Required nutrient supplied through following fertilizers were available in the market.

Fertilizer	NPK 12:32:16	Urea 46% N	MOP 60% K	Sulphur granular DP 90% S	Borax 15% B	Granulose Ferrous sulphate	15% Fe	Zinc sulphate 21% Zn	Mono zinc 33% Zn
Kg/ha	375	287.5	150	50	5	37.5		37.5	12.5

Table 3: Comparative area, production and productivity of the district last three years.

Detail	2006-07	2007-08	2008-09
1. Total Area(ha) ± compare to last year in %	82508+26.5	98125 + 15.9	70817 - 38.6
2. Total Production Lac tons ± compare to last year in %	52.02 + 32.6	55.04+ 5.5	38.87- 41.6
3. Productivity q/ha ± compare to last year in %	630.48+ 8.3	560.96+ 12.4	520.64- 7.7

Table 4: Trench method v/s farmers practice comparison

Particulars/ ha	Farmers practices	Trench method	Results
Seed rate q/ha	62.5	80	Increase seed rate
Germination %	38	64	Increase germination
Mother shoots/ha	450000	870000	Increased
Input Rs./ha	13000	18000	Increased
Expenses on irrigation	2750	2200	Reduced
Logging	More	Less	Reduced
Possibility of inter-cropping	Less	More	Increased

Table 5: Average yield data recorded from farmer's field

Area	Tehshil	Block	Soil type	Yield q/ha (2008-09)	Yield q/ha (2009-10)
AES I	Pilibhit	Amaria, Marori, Lalorikhera	Clay loam, pH7.2	985	1035
AES II	Pooranpur	Pooranpur	Clay loam, pH7.4, High water table	920	1022
AES III	Bisalpur	Barkhera, Bisalpur, Bilsanda	loam, pH7.6l ess fertile soil	883	966

2008-09 decrease in all production parameters due to draught season also farmers not received adequate and timely payments from his produce in previous years. In this year decreases total area, production and productivity as 38.6, 41.6 and 7.7 percent respectively (table-3). Maximum productivity were 630.48 q/ha in 2006-07.

After sowing the data were collected from all sites of AES which shows in Table 4.

It shows from above data that trench method were costly compare to furrow method. In this method increased seed rate and fertilizer cost and doses. Trench method increased germination from 38 to 64 percentage and also number of tillers due to which fertilizer doses has been increased to support plant population for better growth. This save 30 % percent of irrigation water, we irrigate only trenches rather than flooding whole field.

The yield data were recorded from both consecutive seasons all demonstrations at farmers' fields and average of all fields were taken. In the year 2008-09 shows maximum yield from AES-I (985 q/ ha) due to this situation is more fertile compared to AES- II and III. Similar trend were also found in 2009-10. This increased in productivity 1.7 to 1.9 times more yield compared to farmers practices. Singh *et al* (2012) also revealed that trench planting produced significantly higher cane yield 118.7 and 121.7 tonnes/ha compared with other planting methods. Singh *et al* (2008) also recorded 86.2 t/ha from trench planting.

The above data were recorded in presence of three Members of State Crop cutting committee of Uttar Pradesh. The highest yield were recorded 1660 q/ha and lowest 848 q/ha. Average total productivity

Table 6: Data recoded with State crop cutting team in 2009-10 at demonstration Plots

S.No.	Name of Farmer	Village	Cane variety	Area ha.	Yield q/ha
1	Sri Fakeerelal	Sadra	CoS-8436	0.2	1036
2	Sri Khayali Ram	Mendana	CoS-97264	0.2	1024
3	Sri Netram	Sirsa	CoS-97261	0.2	964
4	Sri MunnaLal	Tah	CoS-98231	0.4	1008
5	SmtLajjawati	Pandri	CoS-98231	0.5	1092
6	Sri Ghanshyam	Devipura	CoS-8436	0.5	1660
7	Sri Indrajeet	Piparia	CoS-95255	0.5	1048
8	Sri Mohan Swaroop	Adasai	CoS-767	0.5	848
9	Sri Amandeep	Vaivha	CoS-8436	0.5	1044
10	Sri Devendra Singh	Nagafan	CoS-8436	0.5	1092
11	Sri Yashwant Singh	Umarsar	CoP-84212	0.5	1024
12	SmtRajwantKaur	Jagat	CoS-88230	0.5	972
13	Sri DeenDayal	Kaima	CoSe-92423	0.5	966
14	Sri Lala Ram	Rohtania	CoS-8436	0.5	924
15	SmtGyan Devi	Dahgala	CoS-98231	0.5	938
16	Sri Moti Ram	Aimi	CoS-98231	0.5	992
17	Sri Mani Ram	Mandaria	CoS-97261	0.5	1028
		Average yield q/ha			1039

was recorded 1039 q/ha during this crop cutting, which was about to double productivity of the district. This trench method of planting sugarcane along with SSNM techniques increased in agriculture input but adopted by the farmers due to more beneficial as per unit area of crop production. Tasneet *et al* (2008) also said that farmer leader learned to implement site specific nutrient management and to disseminate the technology to other farmers in their community. This technology initially developed for maize production but was extended to rice sugarcane farmers.

References

Bokhtiar S M., Hossain M.S., Mahmud K. and Paul G.C. (2003). Site Specific Nutrient Management for Sugarcane in Intercropping System, Journal of Plant Sciences 2, 1205-1208.

Jai Veer Singh (2010). Sugarcane Planting Methods.Agropedia,02.20.

KiranYadav (2009) Method of Planting Sugarcane. Agropedia, 13.08.

Singh A.K., Singh S N., Rao A.K. and Sharma M.L. (2012) Enhancing sugarcane productivity through modified trench method of planting in sub-tropical India. The Indian Journal of Agricultural Sciences, 82, 8.

Singh A.K., Menhi Lal, Singh Ishwar, Yadav R.L. Yadav D.V. (2008). Effect of planting method and drought management technique on growth, yield and quality of sugarcane under limited irrigation. Indian Journal of Agronomy,53 (3)200-2004.

Tasnee Attandana, Pradeep Verapattananirund, Russill Yost(2008). Refining and disseminating site – specific nutrient management technology in Thailand. Agronomy for Sustainable Development, 28: 291-297.