

Short Communication

Economics of Maize Fodder Under Organic and Inorganic Fertilizers

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ABSTRACT

The field experiment was conducted to study the effect of organic manure (1500, 3000 and 4500 kg ha⁻¹ farm yard manure) in combination with inorganic fertilizers (0, 60, 90, 120 and 150 kg N ha⁻¹) on economics of maize fodder. The inorganic nitrogen fertilizer was applied as urea, while buffalo farm yard manure (FYM) was incorporated as organic manure. The partial economic analysis showed the superiority of 3000 kg FYM ha⁻¹ in combination with 120 kg N ha⁻¹. The physical productivity (59796.65 kg ha⁻¹) revenue productivity (Rs.74745.81 ha⁻¹), net benefit (Rs.58086.81 ha⁻¹) and cost-benefit ratio (1:4.48) were greater as compared to other treatments. Application of 3000 kg FYM ha⁻¹ in combination with 120 kg N ha⁻¹ was found to be best combination for getting higher fodder yield of maize on economical basis.

Key Words: Maize; Fodder; Economics; Nitrogen; Organic and inorganic fertilizer

INTRODUCTION

Pakistan stands very low with respect to area and production under maize cultivation. This crop is being grown on an area of about 0.94 million ha with an average yield of 1768 kg ha⁻¹ in Pakistan (GOP, 2003). On a world basis maize occupies third position in the production of cereals as a human diet, livestock feed and industrial processing. Maize fodder is good for all types of animals. When entire plant is used for forage it exceeds all other summer forage crops in average yield, dry matter and digestibility. Green maize forage is rich in vitamin-A, and contains 1.56% protein, 0.30% fat, and 5.27% fiber (Chaudhry, 1982). In Pakistan, animals are reared for farm power, wool, milk and meat. It is prime need to provide balance diet to the animals for getting good milk, meat and improved farm power. Maize plays an important role as forage source for livestock. To boost the fodder maize production, it is necessary to adopt proper technology. Use of organic and inorganic fertilizers plays an important role in the maize production. As fodder, maize require large amount of organic and inorganic fertilizer application. It is important that optimum levels of fertilizers should be evaluated for achieving satisfactory maize fodder yield.

MATERIALS AND METHODS

The field study was conducted for partial economic analysis of maize fodder production under organic and inorganic fertilizer application at Student's Experimental Farm, Sindh Agriculture University, Tandojam, Pakistan, during the kharif-2003. The maize variety Akbar was sown

using broadcast method in soil. The treatments applied were: different nitrogen levels using urea (0, 60, 90, 120 and 150 kg ha⁻¹) and fresh farm yard manure from buffalo (1500, 3000 and 4500 kg ha⁻¹). Half of the N with whole P₂O₅ and fresh FYM were applied during land preparation. The 2nd and 3rd N incorporation were made at 20 and 30 days of sowing. All other the cultural practices for area maintenance were adopted. The experiment was laid out in randomized complete block design (split plot arrangement) with three replications. The data were statistically analyzed using the procedures of Gomez and Gomez (1984).

RESULTS AND DISCUSSION

Physical productivity. It is generally expressed in terms of unit weight of product obtained from a particular crop. It was observed that maize crop produced maximum fodder yield under the application of 3000 kg FYM ha⁻¹ with 120 kg N ha⁻¹, followed by 3000 kg ha⁻¹ with 150 kg N ha⁻¹ and minimum maize fodder yield was recorded under treatment of 1500 kg FYM ha⁻¹ with 0kg N ha⁻¹ (Table I).

Revenue income. Revenue income from a given treatment is referred to as the revenue receipts from that treatment, and is expressed in terms of money and is calculated by multiplying physical productivity with the price. It is of vital importance in examining the efficiency of the treatments. The maximum revenue was obtained under the application of 3000 kg FYM ha⁻¹ with 120 kg N ha⁻¹ and it was followed by 3000 kg FYM ha⁻¹ with 150 kg N ha⁻¹ (Table I). **Net benefits.** Net benefit is considered the most important criteria to examine the efficiency of each treatment. Net benefits could be optimized either by minimizing the

Table I. Partial economic analysis of maize green fodder yield (Market value of 2003)

Treatments	Yield (kg ha ⁻¹)	Value of yield (Rs. ha ⁻¹)	Cost of production (Rs. ha ⁻¹)	Net benefits (Rs. ha ⁻¹)	Cost-benefit ratio
1500 kg FYM ha ⁻¹ + 0 kg N ha ⁻¹	19393.23 i	24241.54	9585	14656.54	1:2.53
1500 kg FYM ha ⁻¹ + 60 kg N ha ⁻¹	23886.36 h	29857.95	10665	19197.95	1:2.79
1500 kg FYM ha ⁻¹ + 90 kg N ha ⁻¹	34593.86 f	43242.33	11205	32037.33	1:3.86
1500 kg FYM ha ⁻¹ + 120kg N ha ⁻¹	38144.88 e	47681.1	11745	35936.1	1:4.06
1500 kg FYM ha ⁻¹ + 150kg N ha ⁻¹	35067.60 f	43834.5	12285	31549.5	1:3.57
3000 kg FYM ha ⁻¹ + 0 kg N ha ⁻¹	23619.59 h	29524.49	14499	15025.49	1:2.03
3000 kg FYM ha ⁻¹ + 60 kg N ha ⁻¹	28501.47 g	35626.84	15579	20047.84	1:2.29
3000 kg FYM ha ⁻¹ + 90 kg N ha ⁻¹	40466.43 e	50583.04	16119	34464.06	1:3.14
3000 kg FYM ha ⁻¹ + 120kg N ha ⁻¹	59796.65 a	74745.81	16659	58086.81	1:4.48
3000 kg FYM ha ⁻¹ + 150kg N ha ⁻¹	56731.05 b	70913.81	17199	53714.81	1:4.12
4500 kg FYM ha ⁻¹ + 0 kg N ha ⁻¹	27991.91 gh	34989.88	19413	15576.88	1:1.80
4500 kg FYM ha ⁻¹ + 60 kg N ha ⁻¹	26277.91 gh	32847.39	20493	12354.39	1:1.60
4500 kg FYM ha ⁻¹ + 90 kg N ha ⁻¹	38670.69 e	48338.36	21033	27305.36	1:2.29
4500 kg FYM ha ⁻¹ + 120kg N ha ⁻¹	48459.73 c	60574.66	21573	39001.66	1:2.81
4500 kg FYM ha ⁻¹ + 150kg N ha ⁻¹	43412.87 d	54266.09	22113	32153.09	1:2.45

LSD (5%) = 1808.23; LSD (1%) = 2880.55; S.E. = 1224.24

production cost or by increasing the revenue income after selling the product at higher prices. The net benefits are calculated by subtracting all expenses from gross income. Higher net benefit was achieved under application of 3000 kg FYM ha⁻¹ with 120 kg N ha⁻¹ (Table I).

Cost benefit ratio. It was concluded that the green maize fodder crop earned revenue of Rs.58086.81 ha⁻¹ with the cost of Rs.16659 under 3000 kg FYM ha⁻¹ with 120 kg N ha⁻¹ (Table I). Thus, the fodder maize crop applied with 3000 kg FYM ha⁻¹ in combination of 120 kg N ha⁻¹ was capable of giving higher cost benefit ratio (1:4.48) as compared to other fertilizer treatments used here.

These data support the findings of Juang *et al.* (1997) who noted that the application of organic compound fertilizers contain higher soil fertility compared with organic composts and chemical fertilizers. Advantages of organic fertilizer application include efficient supply of nutrients, low cost and environmental safety. Xiang *et al.* (2001) reported that the combination of these fertilizers also increased soil moisture, soil fertility, growth of maize, output and improved maize grain quality.

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