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Economics of ginger (*Zingiber officinale* Rosc.) production in Amravati District (Maharashtra, India)

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Abstract

The economics of production of ginger (*Zingiber officinale*) in Anjangaon Surji Taluka of Amravati District (Maharashtra, India) was studied during 1995-96. The study indicated that cost of cultivation and gross returns were positively related with size of the holding. The overall cost of cultivation was Rs. 1,32,415.63 per ha and Rs. 1012.04 per qtl. The overall net returns at cost C (which included all costs) was Rs. 50,399.23 per ha. However, net returns decreased with size of holdings. The overall input-output ratio at cost C was 1.38.

Key words : economics, ginger, *Zingiber officinale*.

Introduction

Through Amravati District is an important area for the production of ginger (*Zingiber officinale* Rosc.) in Maharashtra, India, little information is available on the economic viability of the crop in this region. The present study was hence undertaken : 1. To study the levels of input use in ginger production 2. To estimate the cost of cultivation and production of ginger 3. To determine to gross and net returns and to work out the input - output ratio and the efficiency of investment.

Materials and methods

The study was undertaken in Anjangaon Surji Taluka of Amravati District (Maharashtra, India). Three villages namely, Anjangaon Surji, Pandhari and Khodfaon where ginger was extensively grown were selected and all the ginger growers from these three villages were divided into the following three groups based on the total size of their holdings:

Small	:	2.00 ha and below
Medium	:	2.01 to 8.00 ha
Large	:	Above 8.00 ha

Thirty cultivators were selected from each group and a simple tabular analysis was carried out to work out the levels of input utilisation and cost of production of ginger in the selected cultivators. The cost concepts followed

in the cost of cultivation scheme of Government of Maharashtra namely, Cost A, Cost B and Cost C were determined as follows:

Cost A : All direct expenses

Cost B : Cost A + Rental value of land + Interest on fixed capital

Cost C : Cost B + Family labour charges

Results and discussion

Input utilisation

Male and female labour utilisation were highest in large size group of holdings followed by medium and small size groups (Table 1). Human labour utilisation was positively related with size of the holding. The use of family labour, both male and female, was highest in small size group of holdings followed by medium and large size groups. The overall average male labour utilisation was 246.50 days/ha. It was highest in large size group of holdings (249.82) followed by medium and small size groups. The overall average female labour utilisation was 182.22 days/ha and was highest in large size group of holdings (183.48 days) followed by medium and small size groups. Human labour utilisation was mainly used for operations like planting, weeding, irrigation, earthing up and harvesting. The use of bullock labour was 16.49, 17.92 and 18.29 pair days/ha on small, medium and large size group of holdings respectively, while the overall average was 17.57 bullock pair days/ha.

The quantity of seed rhizomes used increased with increase in size of the holding. It was highest in large size group (25.71/ha) followed by medium and small groups, the overall average being 24.45/ha. The overall average

Table 1. Input utilisation in ginger (per ha)

Particulars	Size of holding			Overall mean
	Small[1]	Medium[2]	Large[3]	
Human labour (days)				
Male	242.85	246.83	249.82	246.50
Female	180.57	182.61	183.48	182.22
Bullock labour (pairs)	16.49	17.92	18.29	17.57
Seed (rhizome) (qtl)	23.40	24.24	25.71	24.45
Manure (qtl)	278.40	286.65	286.85	283.95
Fertilizer (kg)				
N	49.19	51.49	52.16	50.95
P	84.59	86.93	88.76	86.76
K	25.77	30.46	30.91	29.05
Irrigation (h)	388.80	413.28	417.76	406.56
Plant protection (Rs.)	2818.83	3090.99	3115.50	3008.44

[1] 2.00 ha and below; [2] 2.01 to 8.00 ha; [3]Above 8.00 ha

quantity of manures applied by selected farmers was 283.95 qtls. The manure utilisation for small, medium and large size group of holdings was 278.40, 286.65 and 286.85 qtls/ha respectively. The overall average application of N P K was 50.95 kg, 86.76 kg and 29.05 kg per ha respectively. The levels of application of N P K increased with the size of the holding. For irrigation, well irrigation with electric pump was the only source of irrigation for ginger. The hours of irrigation in small, medium and large size groups were 388.80, 413. 28 and 417.76, respectively and the overall average was 406.56 h/ha. The expenditure on plant protection was highest in large size group of holdings (Rs. 3115.50) followed by medium and small size groups. The overall average expenditure was estimated to be Rs. 3008.44.

Cost of cultivation

Human labour, seed rhizomes, manures and fertilizers and imputed rental value of land were the major items of cost on all the size groups of holdings. The overall average for these items was 8.68, 42.61, 8.03 and 22.93 per cent, respectively. The share of human labour, seed rhizomes, manures and fertilizers and imputed rental value of land increased with the size of holdings (Table 2).

The overall average cost A, cost B and cost C were Rs. 94,648.09, Rs. 1,25, 836.18 and Rs. 1,32,415.63, respectively. The overall average gross income was Rs. 1,82,814.86/ha. The overall average net income at cost A, Cost B and cost C was Rs. 88,166.77, Rs. 56,978.68 and Rs. 50,399.23/ha, respectively.

Cost A, cost B and cost C and gross income per hectare were positively related with the size of holdings, while net returns per hectare at different costs was negatively related with the size of holdings.

Cost of production

The highest yield (134.26 qtl/ha) of green ginger was obtained by large size group and lowest by small size group of holdings (Table 3). The large size group obtained comparatively higher yields since they used higher levels of yield increasing inputs like seed rhizomes, manures and fertilizers, plant protection and irrigation.

The cost of production of green ginger was highest in large size group of holdings (Rs. 1028.34/qtl) and lowest in small size group. The overall average for all size groups was Rs. 1012.04/qtl. The net return varied between Rs. 364.67 to Rs. 418.29/qtl with an overall average of Rs. 385.20/qtl. The per hectare cost of cultivation at cost A, B and C increased with increase in size of holding and per hectare net return at cost A, B and C decreased with increase in size of holdings, the highest input-output ratio at cost A, cost B and cost C was observed in small size group of holdings The per quintal cost C increased with increase in size of holdings, thus giving a higher per quintal net profit in case of small size group.

Input-output relationship

The overall average input-output ratio at cost A was 1.93, whereas in small, medium and large size groups, the ratio was 2.03, 1.91 and 1.87, respectively. At cost C the overall input-output ratio was 1.38 whereas in small, medium and large size groups it was 1.42, 1.37 and 1.35, respectively. The study revealed that on an average ginger cultivation

Table 2. Cost of cultivation of ginger (Rs/ha)

Particulars	Size of holding			Overall mean
	Small[1]	Medium[2]	Large[3]	
Hired human labour				
Male	6504.86	6890.99	7079.78	6825.21
	(5.24)	(5.10)	(5.13)	(5.15)
Female	4546.49	4626.74	4833.96	4669.06
	(3.67)	(3.43)	(3.50)	(3.53)
Bullock labour	2099.10	2286.59	2381.72	2255.80
	(1.69)	(1.69)	(1.73)	(1.71)
Seed (rhizomes)	50,461.87	58,377.91	60,429.29	56,423.02
	(40.68)	(43.20)	(43.77)	(42.61)
Manure	8351.35	8598.84	8606.06	8518.75
	(6.73)	(6.37)	(6.23)	(6.43)
Fertilizer				
N	645.86	676.06	684.86	668.93
	(0.52)	(0.50)	(0.50)	(0.51)
P	1056.53	1084.76	1108.61	1083.63
	(0.85)	(0.80)	(0.80)	(0.82)
K	314.08	371.37	376.78	354.08
	(0.25)	(0.28)	(0.27)	(0.27)
Irrigation	527.00	236.54	195.58	319.71
	(0.43)	(0.18)	(0.14)	(0.24)
Plant protection	2818.83	3090.99	3115.50	3008.44
	(2.27)	(2.29)	(2.26)	(2.27)
Land revenue and other cesses	100.00	100.00	100.00	100.00
	(0.08)	(0.07)	(0.07)	(0.07)
Depreciation	243.11	248.26	487.41	326.26
	(0.20)	(0.18)	(0.35)	(0.25)
Interest on working capital	9279.12	10,349.02	10,657.46	10,095.20
	(7.48)	(7.66)	(7.72)	(7.62)
Cost A	86,948.20	96,939.07	1,00,057.01	94,648.09
	(70.09)	(71.74)	(72.47)	(71.48)
Rental value of land	29,356.46	30,680.04	31,070.94	30,369.15
	(23.66)	(22.70)	(22.50)	(22.93)
Interest on fixed capital	676.43	815.34	965.05	818.94
	(0.55)	(0.60)	(0.70)	(0.62)
Cost B	1,16,981.09	1,28,434.45	1,32,093.00	1,25,836.18
	(94.30)	(95.05)	(95.67)	(95.03)
Family labour charges	7074.09	6692.17	5972.09	6579.45
	(5.70)	(4.95)	(4.33)	(4.97)
Cost C	1,24,055.18	1,35,126.62	1,38,065.09	1,32,415.63
	(100.00)	(100.00)	(100.00)	(100.00)
Production	1,76,738.74	1,84,680.23	1,87,025.61	1,82,814.86

[1] 2.00 ha and below; [2] 2.01 to 8.00 ha; [3] Above 8.00 ha
Figures in parentheses indicate percentages to cost C

Table 3. Gross income, net income and input-output ratio in ginger

Particulars	Size of holding			Overall mean
	Small[1]	Medium[2]	Large[3]	
Production (qtl/ha)	125.95	132.33	134.26	130.84
Gross income (Rs/ha)	1,76,738.74	1,84,680.23	1,87,025.61	1,82,814.86
Price received (Rs/qtl)	1403.24	1395.60	1393.01	1397.24
Cost of cultivation at				
Cost A (Rs/ha)	86,948.20	96,939.07	1,00,057.01	94,648.09
Cost B (Rs/ha)	1,16,981.09	1,28,434.45	1,32,093.00	1,25,836.18
Cost C (Rs/ha)	1,24,055.18	1,35,126.62	1,38,065.09	1,32,415.63
Net returns at				
Cost A (Rs/ha)	89,790.54	87,741.16	86,968.60	88,166.77
Cost B (Rs/ha)	59,757.65	56,245.78	54,932.61	56,978.68
Cost C (Rs/ha)	52,683.56	49,553.61	48,960.52	50,399.23
Cost of production (Rs/qtl)	984.96	1012.13	1028.34	1012.04
Net return (Rs/qtl)	418.29	374.47	364.67	385.20
Input-output ratio at				
Cost A	2.03	1.91	1.87	1.93
Cost B	1.51	1.44	1.42	1.45
Cost C	1.42	1.37	1.35	1.38

[1] Below 2.00 ha; [2] 2.01 to 8.00 ha; [3] Above 8.00 ha

gave a net return of 38 paise over one rupee investment at cost C. According to the size, it was 42 paise, 37 paise and 35 paise over one rupee investment in small, medium and large size groups of holdings, respectively (Table 3). The yield of ginger was directly related to size of holdings, while input-output ratio was inversely related with the same because as the size of holdings increased the level of utlisation of inputs also increased, but production did not increase in the same proportion. Through production of ginger was profitable on all size groups of holdings, the highest input - output ratio at cost A, cost B and cost C was observed in small size group of holdings, followed by medium and large size groups indicating higher efficiency of small size holdings.