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PRODUCTION COSTS OF MAIZE IN THE COASTAL AREA OF SURINAME

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SUMMARY

During the short raining season of 1976 – 1977 a 1.05 ha plot was planted to maize at the experimental farm of Tijgerkreek-West in the coastal plain of Suriname. The crop was grown using standard cultivation practices. The inputs in terms of labour, machine-hours and materials were carefully recorded from day to day.

The yield was 4650 kg/ha at a costprice of Sf. 0.30 per kg (1-US \$ = Sf. 1.80).

INTRODUCTION

Suriname annually imports large amounts of cereals both processed and unprocessed. The imported maize, about 12,000 tons, is solely used for cattle feed. In 1971 it presented a value of about 4 million guilders. The expected demand for 1985 is estimated at 16,000 tons.

The maize area in Suriname is small. In 1969 about 226 ha of maize were grown with a total production of approx. 280 tons of grain. So far research on this crop has been mainly focussed on varietal selection and aspects of crop husbandry. Since little was known about the production costs of maize, a 1.05 ha plot was planted to this crop and an analysis made of the amount of labour and other inputs required. Standard cultivation practices were used. On the basis of the data thus collected a cost price was calculated.

EXPERIMENTAL SITE

The study was carried out at the experimental farm Tijgerkreek-West located in the coastal plain. Part of the soil of the plot was loamy sand (approx. 40%) and part sandy loam (approx. 60%). The plot was divided into 45 m long cambered beds varying in width from 5.5 to 10 m.

The soil was disc-ploughed and subsequently rotavated, both of which were done with a four-wheeled tractor two weeks before sowing. Immediately before planting the soil was lightly rotavated using a two-wheeled tractor.

VARIETY, SOWING AND PLANT ARRANGEMENT

A locally developed synthetic maize variety was used. Sowing was done with a hand – operated precision seeder (Esmay, model 1001-B). Row distance was 90 cm, plant distance in the row 29 cm as established by plant counts at the time of harvesting.

Where seeds failed to germinate and plant distances were more than 30 cm, infilling took place. It was done by hand one week after sowing. One week later plants were thinned if distances were less than 20 cm.

The total amount of seed used was 20 kg or 19 kg/ha.

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CROP PROTECTION

Two days after sowing half of the plot was sprayed with the pre-emergence herbicide alachlor at the rate of 6 litres commercial product (Lasso) per hectare; one day later the other half was treated with methazole at the rate of 2,5 litres commercial product (Probe) per hectare. Six weeks from sowing some paraquat was used for a spot application. The herbicides were applied with a hand-operated knapsack sprayer.

To protect the germinating seeds and the young seedlings against mole – crickets chlordane was applied in strips over the plant rows immediately after sowing. This insecticide was applied with the same precision seeder, at the rate of 5 kg/ha.

Insecticides to control *Spodoptera frugiperda* were applied about every 6 days for 6 weeks starting 10 days from sowing. The chemicals used were trichlorfon, carbaryl and malathion. The amount of caterpillar damage to the ears, determined at harvesting, was estimated at 6%.

FERTILIZING

Fertilizer rates were based on soil chemical analyses. The following amounts were applied per hectare. At sowing 100 kg sulphate of ammonia, 100 kg triple superphosphate and 40 kg potassium chloride were band placed over the plant rows. Four and seven weeks from sowing 200 kg sulphate of ammonia and 40 kg potassium chloride were band placed along the plant rows. All fertilizer was applied by hand.

HARVESTING

The maize was harvested between 105 and 110 days from sowing. The ears were hand picked, piled, bagged and carried to the edge of the field.

COST ANALYSIS

Table 1 summarizes the number of man hours, the cost of labour, materials and machinery use required for the growing of one hectare of maize. Most activities were timed in a number of sub plots so that lowest and highest figures are given. The cost of one 8-hour man-day is Sf. 12.50 or Sf. 1.56 per hour. The yield was 4650 kg grain/ha.

Not included are the interest on the money invested in the clearing, the management costs and other indirect costs such as rent. The cost of threshing and artificial drying were not determined in this trial. The data presented are bound on figures supplied by the department of Agricultural Engineering.

Production costs of maize in the coastal area of Suriname

Table 1. Direct costs per item for the growing of one hectare of maize.

item	man — hours		labour — costs		other costs (materials, etc.)
	lowest	highest	lowest	highest	
ploughing	7.0	}	Sf 20.00	Sf 20.00	Sf. 105.00
rotavating					
4-wh. tractor	6.0				
2-wh. tractor	4.5	5.5	7.00	9.00	40.00
seed					8.00
sowing	6.0	11.5	9.00	18.00	
infilling	14.5	30.0	23.00	47.00	
thinning	17.0	18.5	27.00	29.00	
chlordane application	4.0	5.0	6.00	8.00	23.00
herbicides application	12.0	19.0	19.00	30.00	87.00
fertilizing	26.0	34.5	41.00	54.00	380.00
insecticides (<i>Spodoptera</i>) application	45.5		71.00	71.00	64.00
picking and piling	25.5	42.0	40.00	66.00	
bagging and transport	67.0	77.0	105.00	120.00	
threshing	20.0	32.0	31.00	50.00	154.00
drying					93.00
			Sf 399.00	Sf 522.00	Sf 954.00

From the data it appears that the total direct costs to grow one hectare of maize varied between Sf. 1353,— and Sf. 1476,— which corresponds with a price per kg of 29.1 and 31.7 cents respectively.

DISCUSSION

The price of one kilogramme of maize as determined in this trial was hardly lower than the one of imported maize which varied between 30 and 35 cents. The question arises whether cost price reduction is possible and where such reductions could be achieved.

The intensity of soil preparation very much depends on soil type and on the amount of weeds present. With a clean field and a light soil texture the time lapse between the first rotavating and the sowing can be reduced so that the second rotavating with a 2-wheeled tractor is not required. This would mean a price reduction of 1 cent per kilogramme.

Infilling and thinning together meant between 31.5 and 48.5 hours of labour which added between Sf. 50.00 and Sf. 76.00 to the total costs. A better adjusted seeder or another sowing machine plus high quality and more uniform seed treated with a seed-dressing could cut out these practices and reduce the costs by 1.5 cent.

The larvae of *Spodoptera frugiperda* cause much damage and regular sprayings were required to control this insect. Unfortunately the chemicals currently advised do not seem very effective nor persistent. A cheap effective and persistent insecticide like chlordane that can be applied to the soil at sowing and that is effective against soil insects at first and later to *Spodoptera*, could

Maize – Economic aspects

reduce the production costs with at least Sf. 77.00 in labour and Sf. 64.00 in insecticides. Per kilogramme of maize this would mean 3 cents.

Further reduction in labour costs are possible with the picking, piling, bagging and carrying the ears to the edge of the field. In view of the large number of man hours necessary for these operations this point needs further study.

It is the author's opinion that given current practices the cost price of maize could be reduced to 25 cents per kilogramme.

NAME OF PAPER: Production Costs of Maize in the Coastal Area of Suriname
(K. Manniesing)

Question by: R.P.S.Ahluwat
Country: Suriname

QUESTION: What about land rent, depreciation cost and capital interest which I feel are also important investments and should be considered while calculating the net profits.

ANSWER: First – Land rent is not included
Second and Third – no depreciation costs and capital interest because working with wage-earners is being supposed.

Question by: E.B. Whyte
Country: Barbados

QUESTIONS:

1. On page 5 of your Paper, (the section dealing with *Spodoptera* Control) you seem to be advocating a return to chlorinated hydro-carbons – are you really serious?
In this period of environmental concern, price should not be the only factor for selecting a pesticide.
2. At what rates were the insecticides trichlorfon, carbaryl and malathion used?
Please also indicate the current prices per kg.

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- ANSWERS:
1. I agree with you, but up to now we did not find an effective substitute.
 2. trichlorfon – 2-4 gr/l water – Price Sf 12.50/kg
carbaryl – 2-4 gr/l water – Price Sf 10.–/kg
malathion – 2-6 cc/l water – Price Sf 7.50/l

Questions by: P. Segeren
Country: Suriname

- QUESTIONS:
1. How do you think to reduce production costs with at least Sf 77 in labour and Sf 64.00 in insecticides as total labour costs for applying insecticides mentioned in table 1 are only Sf 79.00 and for insecticides Sf 87.–.
 2. Is it not better to sow some extra seeds instead of controlling mole crickets by insecticides?

- ANSWERS:
1. Sf. 77.– is composed of lowest labour costs of chlordane application (Sf. 6.–) and insecticides application (Sf. 71.–).
 2. mole crickets attack usually all seedlings in their vicinity.