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Vol XXI
No. 4

ISSN 0019-5014

CONFERENCE
NUMBER

OCTOBER-
DECEMBER
1966

INDIAN JOURNAL OF AGRICULTURAL ECONOMICS



INDIAN SOCIETY OF
AGRICULTURAL ECONOMICS,
BOMBAY

GROWTH OF GROUNDNUT IN GUJARAT STATE

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There are various concepts of agricultural growth and hence several ways of measuring it. The growth in agricultural production is the net result of the growths in area and productivity of the crops. In Gujarat, for increasing agricultural production deliberate planned efforts are made (i) to increase the yield of the crop, and (ii) to bring more area under plough. This paper attempts to measure the regional growth rates in groundnut production, area and yield in Gujarat State.

For the purpose of regional study, Gujarat State is divided into following four regions more or less homogeneous in agro-climatic conditions :

Region	Districts covered
I South Gujarat	Surat, Bulsar, Broach and Dangs
II Middle Gujarat	Baroda, Panchmahals, Kaira and Ahmedabad
III North Gujarat	Banaskantha, Sabarkantha and Mehsana
IV Saurashtra-Kutch	Amreli, Bhavnagar, Jamnagar, Junagadh, Rajkot, Surendranagar and Kutch

In Gujarat, groundnut is mainly taken as a *kharif* crop. It is grown on calcareous clay loam soils of Junagadh, medium black soils of Rajkot, Amreli, Jamnagar and Panchmahals districts, light medium and hilly soils of Surendranagar, coastal alluvial soils of Bhavnagar and Kutch districts. Thus groundnut is practically grown in all types of soils in Gujarat State.

In Gujarat, the growth in area under groundnut during the last 15 years is spectacular. It has increased from 21 lakh acres during 1951-56 to 51 lakh acres during 1961-66. The regional average area during the three plan periods is given in Table I.

TABLE I—REGIONAL GROWTH IN AREA UNDER GROUNDNUT DURING THE THREE PLAN PERIODS

(area in lakh acres)

Region	Area		
	1951-56	1956-61	1961-66
I	0.61	0.88	1.67
II	2.91	4.46	5.35
III	1.98	3.06	4.38
IV	15.60	32.30	39.28
Total	21.10	40.70	50.68

It is seen that about 75 per cent of the total area is in the Saurashtra-Kutch region alone. Its cultivation is minimum in the South Gujarat region. No significant change in the percentage distribution of area in the four regions is observed over a period of 15 years.

Methodology and Measurements of Growth

The trend values of production and area of groundnut were obtained by taking their moving quinquennial averages from 1951-52 to 1961-66, *i.e.*, over the three plan periods. These averages were calculated for each region and for the State as a whole, and were converted into index numbers taking 1951-56 as base period. The index numbers of yield were obtained by dividing the index of production with index of area for each period. Linear regression was found to be a good fit for the trends of growth in area and production in all regions and the State as a whole. However, the growth of yield did not show a linear trend. Therefore, for the purpose of measuring the annual growth rates, the linear regression equations with 1956-61 as origin were fitted to the index numbers of production and area for each region and State. The annual linear growth rates with their corresponding standard errors and coefficient of determinations (r^2) are given in Table II.

TABLE II—LINEAR GROWTH RATES OF PRODUCTION AND AREA OF GROUNDNUT DURING 1951-52 TO 1965-66 IN GUJARAT STATE

(Base: 1951-56=100)

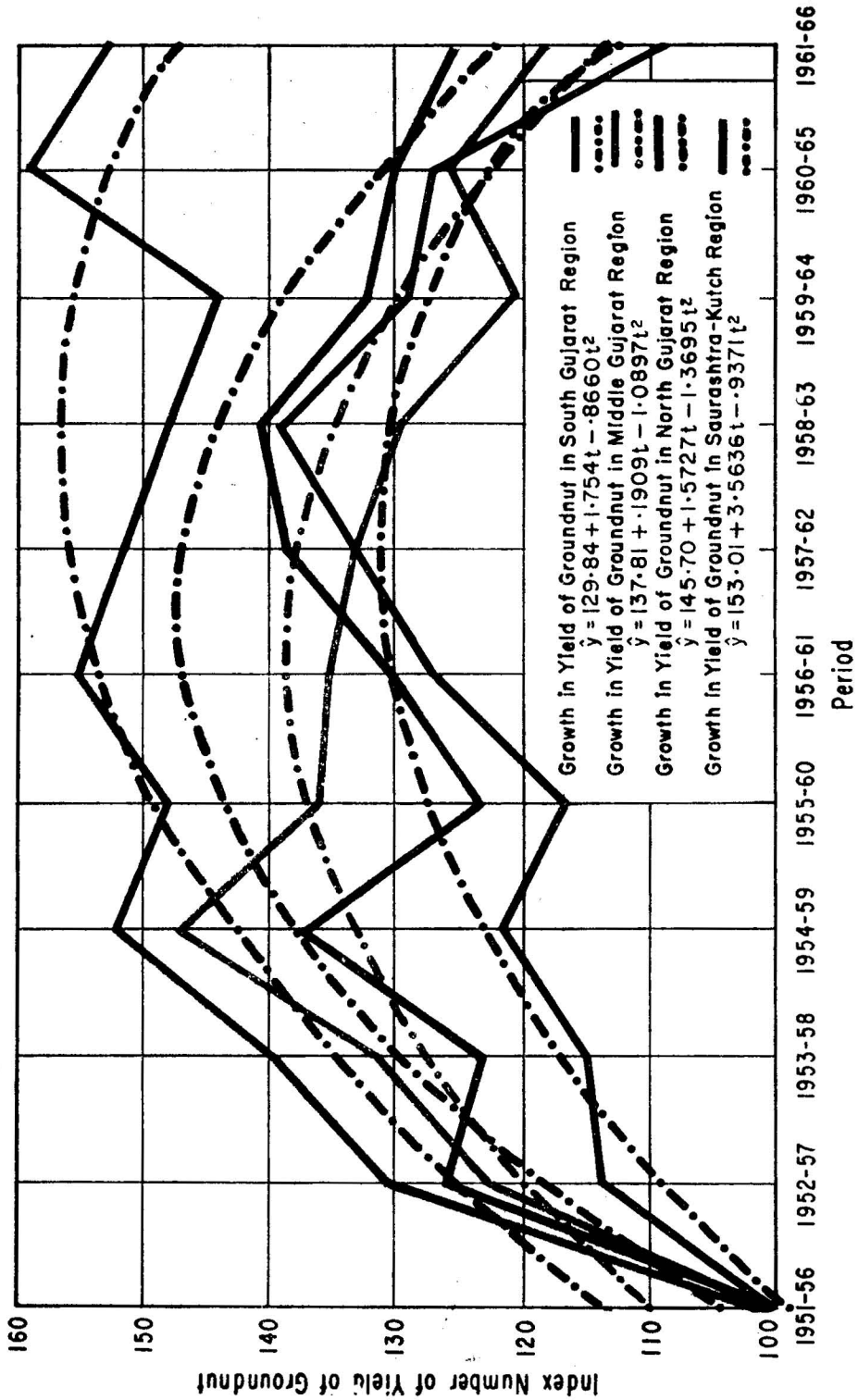
Region	Linear growth rate (per cent)	Production		Area		
		S. E.	r^2	Linear growth rate (per cent)	S. E.	r^2
I	24.3**	4.9061	.92	20.8**	1.9857	.73
II	13.2**	1.9965	.94	10.7**	0.9151	.83
III	19.7**	1.4405	.95	14.1**	0.6823	.98
IV	29.7**	2.7579	.93	17.0**	1.4167	.94
State	25.7**	2.3093	.93	15.8**	1.1313	.95

** Significant at 1 per cent level.

It is revealed that the growth rate in area and production is highly significant in all the four regions and the State. The growth rate in area is highest in the South Gujarat region while the production growth rate is highest in the Saurashtra-Kutch region. This is mainly because the growth in yield in the South Gujarat region remained lowest among all the regions.

The trend in yield has not shown any linearity with time. It is evident from Figure I that the yield had moved on curvilinear curve reasonably of second degree in all the regions of the State. It seems from the fitted second degree regression curves that the marginal rate of growth has begun to decline from the period 1957-62 in the first three regions and from 1958-63 in the Saurashtra-Kutch region. This behaviour of yield of groundnut is due to the rapid growth of in-

Figure I - GROWTH IN YIELD OF GROUNDNUT IN GUJARAT STATE



ferior lands under groundnut after the period 1957-62. The marginal lands poor in fertility under bajra and jowar have been put under groundnut without bringing significant change in technology. As a result of this, the yield has been observed to decline in all the regions. However, the fall in yield is less in the Saurashtra-Kutch region as compared to the fall in yield in the other three regions. This may be explained by the reason that the farmers of Saurashtra-Kutch have tried to minimize the fall in yield of groundnut by using more fertilizers and other inputs. About 80 per cent of superphosphate is consumed for groundnut crop in the Saurashtra-Kutch region. In the other three regions where the land is more fertile and the potential yield is comparatively higher than in the Saurashtra-Kutch region more efforts need to be made for raising yield. However, if no efforts are made to change the present technology for raising the yield of groundnut and if the rate of growth of its area, given in Table II for the period 1951-52 to 1965-66, remains more or less same during the Fourth Plan period, the yield in the first three regions, *i.e.*, in South, Middle and North Gujarat will tend to fall to 316, 147 and 109 lbs. per acre respectively if the present price structure remains the same; vice versa, if the price structure of groundnut and other related crops remains the same during the Fourth Plan period, the growth in area will tend to decline if the yield continues to fall in the first three regions.

There are very high production possibilities of groundnut in Gujarat. The yield of groundnut in Gujarat has remained far below its potential yield. For estimating the potential yield, the State Department of Agriculture has performed several research experiments at various places in the State over a period of time. The summarized results of some experiments on groundnut are given in Appendix 1. It will be seen that the potentiality of groundnut production is more than 100 per cent in the State, which could be achieved if the improved seeds, fertilizers, manures, etc., are supplied in adequate quantities to the farmers and when the benefits of improved practices are fully recognized and realized by the farmers of the State.

APPENDIX 1

SUMMARIZED RESULTS OF SOME EXPERIMENTS CONDUCTED AT VARIOUS PLACES IN THE STATE

Type of experiment	No. of years of experimentation	Yield per acre in lbs.
Bunch varieties	3	1322
Spreading varieties	3	1479
Hybrid varieties	5	1202
Spacing	4	1106
Spacing	4	1067
Manures	4	1120
Fertilizers	3	1127
Fertilizers	3	990
Fertilizers	2	1328
Fertilizers	2	993
Irrigation	2	1549
Irrigation	2	1115

Source : Groundnut in Gujarat—A Review of Research for the last Thirty-five Years (1927-62), D. D. Gopani and D. H. Dave, Main Oilseeds Research Station, Junagadh, Gujarat State.