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भारतीय कृषि सांख्यिकीय अनुसंधान संस्थान  
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STATISTICAL PUBLICATIONS

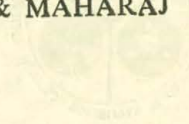
Volume VII

Compiled and prepared

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## प्राप्तकथन

यह भा० कृ० सां० अ० सं० सांख्यिकीय सूचना-पत्र का छठवाँ सर्वांक है। इसमें इस संस्थान की अप्रैल-जून, १९६१ की तिमाही गतिविधियों से सम्बन्धित जानकारी का विवरण दिया गया है।

मुझे आशा है कि यह सूचना-पत्र कृषि अनुसंधान सांख्यिकीविदों तथा अन्य प्रयोक्ताओं के लिए लाभदायक सिद्ध हो रहा है। इसके अगले अंकों में सुधार लाने हेतु मैं किसी भी प्रकार की टिप्पणी और सुझावों का आभार सहित स्वागत करूँगा।

मैं संस्थान के उन सब अधिकारियों तथा उन सदस्यों का आभारी हूँ जिन्होंने भा० कृ० सां० अ० सं० सांख्यिकीय सूचना-पत्र के इस अंक के लिये अपेक्षित सामग्री प्रदान की है।

मैं सर्वे श्री मदन मोहन, सोमदत्त, श्रीमती कुसुमलता और श्री फणीन्द्र-पालसिंह का भी आभारी हूँ जिन्होंने इस सूचना-पत्र के संकलन एवं मुद्रण में अपना भरपूर सहयोग दिया है।

**दरोगा सिंह**

निदेशक

भारतीय कृषि सांख्यिकीय अनुसंधान संस्थान  
वई दिल्ली-११००१२



## P R E F A C E

This is the twenty-sixth issue of 'IASRI Statistical Newsletter' and covers the activities and allied information in respect of this Institute during the quarter April-June, 1981.

I hope this Newsletter has been proving useful to the Agricultural Research Statisticians and other users. I would welcome and appreciate any comments and suggestions for its improvement in the subsequent issues.

I am thankful to all the officers and the staff of the Institute who supplied the requisite material for this issue of the "IASRI Statistical Newsletter".

I am also thankful to S/Shri Madan Mohan, Som Dutt, Phanindra Pal Singh and Smt. Kusumlata for the help rendered in compilation and printing of this Newsletter.

DAROGA SINGH  
DIRECTOR  
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## 1. NUTRIENT REQUIREMENT OF GROUNDNUT

Groundnut is one of the widely used medium for cooking and is also a foreign exchange earner ; as such, it occupies an important place in the Indian agricultural economy. It occupies about 4% of the total gross cropped area. It is mostly grown under unirrigated conditions and only about 7% of the total area under the crop is irrigated. Being a rainfed crop, the yield-rate is low and it also fluctuates widely over years. The groundnut accounts for about 5% of the total area under oilseeds whereas its contribution in production is about 70%. Andhra Pradesh, Gujarat, Karnataka and Tamil Nadu are the major groundnut producing states and they together account for about 75% of the total production. Gujarat alone accounts for about one-third of the total production. During the past two decades, the growth rate of area, production and productivity has been low as compared to that for the important food crops, namely rice and wheat. Even among the oilseeds, the growth-rate of production for groundnut during the period 1960-61 to 1978-79 was less (0.94) as compared to that for rape-seed and mustard (2.65).

To examine the pattern in the change in the area, production and productivity for various states and for the country as a whole, the percentage changes in these components for the period, 1969-73 & 1974-78 over 1962-66 were worked out and are presented in the table below :

Table No. 1 : Percentage changes in area, production and productivity for different states during 1969-73 & 1974-78 over 1962-66.

Sl. No.	State		1962-66 Base Period	1969-73 Period I	1974-78 Period II
1.	Andhra Pradesh	A	1069	134.42	116.28
		P	755	152.19	139.47
		Pr	706	113.17	118.41
2.	Gujarat	A	1992	86.40	90.66
		P	1215	94.40	131.44
		Pr.	610	109.18	142.45



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3. Karnataka	A	858	100.23	106.06
	P	494	119.23	121.66
	Pr.	576	118.92	113.72
4. Maharashtra	A	1083	75.53	76.89
	P	645	74.11	89.15
	Pr.	595	98.15	116.13
5. Tamil Nadu	A	910	116.37	103.62
	P	956	113.28	104.50
	Pr.	1051	97.34	100.67
6. Madhya Pradesh	A	482	92.74	97.30
	P	260	108.85	116.54
	Pr.	539	119.29	119.29
7. Uttar Pradesh	A	337	99.41	111.27
	P	307	80.78	85.99
	Pr.	911	81.23	76.62
8. All India	A	7147	100.67	100.48
	P	4876	111.57	121.43
	Pr.	682	111.58	120.82

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Legend A : Area in '000 ha.

P : Production in '000 Tonnes.

Pr : Productivity in Kg/ha.

At National level an increasing trend in production was observed. The production level during Period II increased by 20% over 1962-66. This is mainly due to the matching increase in the productivity. There has been no change in the total cultivated area in the country during the entire period. There was variation in the pattern of changes in the area, production and productivity during periods I and II over the base period in different states. In Andhra Pradesh and Karnataka the production and productivity was higher in both the periods as compared to that of the base period. In Gujarat, a major groundnut growing state, the total area declined but the production registered an increase of 30% in period II over the base period. It is due to the spectacular increase in the productivity of about 42%. In Tamil Nadu, the area and production for period I over the base period were higher by 16% and 13%



respectively where as the corresponding increase in the period II were only 3% to 4%. In the remaining States, there have been some marginal changes in the productivity as well as production.

As has been suggested earlier, that the compound growth rate of this crop has been of the order of 0.94, which is much less than that of the population growth rate and as such, per capita availability of groundnut continues to decline during the recent period. In order to increase the productivity of this crop, it is essential to extend the improved technology among the cultivators based on the use of fertilizers. In order to advise the correct and economic use of fertilizers to the cultivators under varying levels of management practices, it is necessary to formulate the recommendation based on average response for homogeneous soil areas representing different soil and fertility variations based on experiments conducted on cultivators' fields. Therefore, in the subsequent section, the results of the experiments planned and conducted on farmers' fields to study the response of N,P and their combinations during the period 1969-79 under the All India Coordinated Agronomic Research Project are summarised.

The main objective of these experiments was to classify the areas for their responsiveness to different plant nutrients. For the purpose, in each state, few districts were identified every three years to carry out the programme. In each of the selected district, the farmers' fields were selected through stratified multi-stage random sampling. In each district, blocks were the strata and the villages were the first stage unit and the fields were the ultimate unit of selection. The selected field was divided into as many parts as the number of treatments to be tested. The number of experiments conducted in each district were sufficient to provide the response data through statistical analysis. These experiments were conducted by a team of qualified scientists and supporting technical staff stationed at the district as well as at the state level. The results of the responses of N,P and different combinations of N and P are presented in Table No. 2. In order to advise the cultivators, the choice of the dose not only depends on the total response that it provides but also the return per rupee invested on the input. In this connection, the benefit cost ratio to the application of fertilizer at different levels of N,P and their combinations are also presented in the same table. The application of N at 10 to 20 Kg N/ha has given moderate to low response in most of the States except Tamil Nadu where the response was of about 3 q/ha. With the increase in the level of N, there has been a marginal increase in the response in all the States. To the application of P alone at 30 to 45 Kg  $P_2O_5$ /ha, responses were however higher in most



of the States as compared to that for N alone. The response was exceptionally low in Tamil Nadu. A good response of 3.2 and 5 q/ha was observed in Orissa and Andhra Pradesh respectively and in the remaining States, the response was however less than 2 q/ha. The response to 10 to 20 Kg N/ha + 30 to 45 Kg P<sub>2</sub>O<sub>5</sub>/ha was high in Orissa and Tamil Nadu being 5.5 and 4.9 q/ha respectively. The responses varied between 3 to 4 q/ha for Andhra Pradesh (kharif), Gujarat, Karnataka, Madhya Pradesh, Maharashtra and Rajasthan. The total net return to the application of different types of fertilizers were quite substantial in all cases. The net return for 10 to 20 Kg N/ha + 30 to 45 Kg P<sub>2</sub>O<sub>5</sub>/ha were substantially higher in all the States as compared to that obtained to the application of N and P alone. The benefit cost ratio were also more than 3 in most of the cases. A very high benefit-cost ratio of the order of 6 was obtained for Orissa and the corresponding ratio was 8 for Andhra Pradesh.

It is thus inferred that bulk of crop is grown under rainfed conditions and consequently the productivity is highly unstable and low. In order to increase the productivity, it is very essential to develop better resources for water management practices as well as to extend the use of fertilizers among the cultivators. The most appropriate dose for the adoption would consist of a small dose of N combined with a moderate level of phosphatic fertilizer.

Table No. 2 : Fertilizer Response (Kg/ha), net-return (Rs/ha) and Benefit-cost Ratio for groundnut (unirrigated) based on experiments conducted on farmer's fields

Sl. No.	State (Season)	Control (unfertilized field)	Rates of fertilizer application				
1	2	3	4	5	6	7	8
			N <sub>a</sub> '	P <sub>b</sub> '	N <sub>a</sub> 'P <sub>b</sub> '	N <sub>a</sub> 'P <sub>c</sub> '	
1.	Andhra Pradesh (Kharif)	Response	782	78	125	236	233
		Net Return		2512	2515	2780	2592
		Return/Re.		3.47	1.81	2.59	1.54
2.	Andhra Pradesh (Rabi)	Response	836	245	392	786	816
		Net Return		3175	3478	4592	4503
		Return/Re.		10.89	5.70	8.61	5.41
3.	Gujarat (Kharif)	Response	839	186	145	321	563
		Net Return		3007	2746	3236	3753
		Return/Re.		8.72	2.11	3.52	3.73



1	2	3	4	5	6	7	8
4.	Karnataka (Kharif)	Response	983	237	167	329	547
		Net Return		3592	3244	3662	4137
		Return/Re.		10.53	2.43	3.61	3.63
5.	Madhya Pradesh (Kharif)	Response	730	164	132	340	502
		Net Return		2614	2380	2936	3243
		Return/Re.		7.29	1.92	3.73	3.33
6.	Maharashtra (Kharif)	Response	1040	178	249	365	476
		Net Return		3586	3661	3941	4095
		Return/Re.		7.91	3.62	4.00	3.16
7.	Orissa (Kharif)	Response	881	147	3.18	550	782
		Net Return		3016	3391	4019	4536
		Return/Re.		6.53	4.63	6.03	5.18
8.	Rajasthan (Kharif)	Response	491	184	1.39	357	277
		Net Return		1957	1684	2270	1851
		Return/Re.		8.18	2.02	3.91	1.84
9.	Tripura (Kharif)	Response	1377	257	4.99	744	
		Net Return		4834	5422	6089	—
		Return/Re.		11.42	7.26	8.16	
10.	Tamil Nadu (Kharif)	Response	1298	193	115	336	386
		Net Return		4405	4033	4628	4599
		Return/Re.		8.58	1.67	3.68	2.56
11.	Tamil Nadu (Rabi)	Response	1289	320	1.01	490	5.58
		Net Return		4759	3964	5063	5148
		Return/Re.		14.22	1.47	5.37	3.83

## Legend :

$N_a'$  = 10 to 20 kg/ha. of N,

$P_b'$  = 30 to 45 kg/ha. of  $P_2O_5$

$N_a'P_b'$  = 10 to 20 kg/ha. of N + 30 to 45 kg/ha. of  $P_2O_5$

$N_a'P_c'$  = 10 to 20 kg/ha. of N + 60 to 80 kg/ha. of  $P_2O_5$

Rate of 1 kg of Groundnut = Rs. 3.00

Rate of 1 kg of N Nutrient = Rs. 4.50

Rate of 1 kg of  $P_2O_5$  Nutrient = Rs. 5.50



## 2. CONSTRAINTS ANALYSIS OF PADDY PRODUCTION IN PURI DISTRICT OF ORISSA

Rice is a major foodgrain crop of Orissa, occupying about 70 percent of the total cropped area and contributing more than 75 percent to the total agricultural output of the State. Hence the economy of the State is greatly influenced by the production of rice in the State. Though among the different rice growing States in India, Orissa is the pioneer in the cultivation of rice, yet it is unfortunate that the yield rate of rice in Orissa is still very low when compared with the yield rates of neighbouring States like Andhra Pradesh, Assam, West Bengal etc. The productivity of rice in the state is only about 892 kg. per hectare, which is even much below the Country's overall average of 1408 kg. per hectare during the last decade. In spite of the recent advances in crop husbandry, the yield on per hectare basis has remained quite low. Low yields have affected adversely the availability of grains and returns to the farming community. The low yield rates of paddy in the State is a matter of great concern to the farmers, researches and the administrators.

The gaps between the yield potentials of the various varieties of paddy and actual yield obtained by farmers are an eye opener. The various developmental programmes launched by the State from time to time have not made any significant impact on rice yield. In this context, it therefore becomes important to review the paddy production programme that is recommended and actually practised by the farmers to identify the yield barriers of paddy at the village/farm land. The theoretical constraints to achieving high yield rates are many—physical, biological, social, economic and institutional—which need to be identified for a given rice growing tract at micro level to suggest some remedial measures.

With these aims and objectives in view, the research project on 'Identification of the socio-economic and other constraints operating in the spread of modern technology on rice farms in the operational research project area in Puri district of Orissa' was planned at this Institute for detailed study.

To achieve the study's objectives, a household survey of selected farm households was carried out. From each of the four villages, viz., Ghorodia, Beguniapada, Sisupada and Jorokani of Delang block, a simple random sample comprising of about 10 percent of the farm households was selected and information on land holdings, land utilisation, tenurial structure, cropping pattern, yield levels, technical know-how, agronomic practices followed on the farm and reasons for partial/non-adoption of recommended practices, credit



facility availed, availability of crucial inputs for crop production, storage, marketing and disposal of the produce and other socio-economic characteristics of the sampled farms pertaining to kharif season of 1978 was canvassed on a specially designed proforma for this purpose by personal interview. In addition to the survey enquiry, research data on demonstration and crop cutting experiments, etc., conducted under the ORP and other relevant information of the area from secondary sources were also collected and utilised for analysis. The salient results emerging from the analysis are presented below.

The characteristic feature of all the villages was that major area of kharif paddy (90.9 percent) was cultivated with local or locally improved varieties. The examination of the adoption pattern and intensity of adoption of four packages of improved practices, viz., cultivation of HYV seeds, application of chemical fertilizers, application of plant protection chemicals and use of improved implements revealed that the indices of adoption and area of one practice package highest and four practices package were lowest in all the villages.

Adoption pattern among different holding size groups indicated that the adoption index is highly associated with the holding size groups. As regards intensity of adoption, it is, however, revealed that the intensity of adoption is higher in packages of less practices comparatively in all the holding size groups. The choice of varietal type, the prevailing soil water relationship, use of inputs, and the socio-economic characteristics of the area is reflected in the low yields of rice. The yields levels in general are reported to be lower this year compared to previous year because of heavy incidence of flooding and pest and disease damages.

The study revealed a significant yield gap of 1732 kg/ha between the potential farm yield (3005 kg/ha) as demonstrated on farmers fields in the study area and average farm yield of paddy (1273 kg/ha) in the area estimated on the basis of survey enquiry data. The behaviour of the yield gap among different categories of farms (classified on the basis of level of technology adopted) revealed that yield gap decreased as the farmers adopted more and more improved practices on their farms. It was further revealed that low level of input use, viz. HYV, fertilizers application and plant protection measures (biological), poor economic condition and indebtedness (social) and type of land (physical) are the main factors contributing to this yield gap.



To investigate further into the discriminating characteristics of the farmers who grew HYV and who did not grow these varieties, discriminant function technique was utilised. The results indicated that use of fertilizer application and plant protection measures were the measure characteristics discriminating the two groups of farmers; the other discriminating characteristics being the average productivity of land, type of land, literacy and area under rice crop.

The examination of the reasons for partial or non-adoption of the modern technology as put forward by the farmers revealed that uncertainty about the performance of the crop due to unfavourable weather and soil water conditions, pests and diseases, susceptibility and poor economic conditions are the important factors hindering adoption of the modern technology and resulting in low productivity of the crop in the area during the kharif season.

Thus it emerges from the study that here is a need for evolving some new high yielding varieties seeds which could meet location specific requirements and ensure good harvest of the crop. Institutional efforts are also needed in the provision of drainage and optimal utilisation of irrigation water and for consolidation of the fragmented holdings. Surveillance organisations need to be activated in such area where pests and diseases are important problems. Some sort of crop insurance need to be introduced to ensure the farmer with some minimum return. Such measures could help a great deal in persuading the farmers to adopt modern technology on their farms and reap a good harvest.

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### **3. MINI-WORKSHOP ORGANISED BY THE I.A.S.R.I. Mini-Workshop on 'Statistical Analysis of Animal Breeding Data'**

In pursuance of the recommendations of third conference of Agricultural Research Statistician held at IASRI, New Delhi, a Main-Workshop on 'Statistical analysis of animal breeding data with special reference to standardising procedures of analysis' was organised at the IASRI, New Delhi from 4th to 7th May, 1981. The workshop was attended by thirty four participants from various organisations, viz., ICAR Institutes, Agricultural Universities, State Animal Husbandry Departments, Ministry of Agriculture, National Dairy Development Board, etc., The deliberations of the workshop were divided into the following four sessions :



Session I : Genetic parameters, Crossbreeding and Biochemical Polymorphism.

Session II : Progeny Testing and sire evaluation

Session III : Poultry breeding and use of computer in animal breeding.

Session IV : Plenary session

Twenty five papers were presented on various topics. The following broad recommendations emerged during this workshop :

- (i) In cross-breeding programmes, the drought capacity of animals should be taken into account in addition to the milk production capability.
- (ii) In view of consumers preference, efforts may be made to increase fat content in buffalo milk by adopting suitable cross-breeding programme.
- (iii) Milk recording for cross-bred animals under field conditions should be standardised taking into account the local factors/variables responsible for introducing extraneous variations. A rationalised supervision for systematic milk recording should be adopted to improve the quality of data collected.
- (iv) There is a need for empirical investigations to identify the negatively correlated characteristics for their inclusion in the generalised index for testing sires for milk production.
- (v) Studies on different types of genotype-environment interactions need to be carried out on village data to decide on the best procedures for evaluating sires under field condition.
- (vi) In relation to improvement of rate of lay in poultry, the new selection index developed at IASRI may be tried at several poultry breeding projects. This index is a modification of the usual Osborne's index wherein individual's egg weight is also included in addition to combining information about rate of lay from its own performance and the average performance of its half-sibs and full-sibs families.
- (vii) Suitable packages for the analysis of animal breeding data may be developed by a team of experts consisting of animal breeders, statisticians and programmers.



- (viii) Periodical training courses in computer programming for users need may be conducted at I.A.S.R.I. The facilities for such training programmes may also be extended to the statisticians/animal breeders of Animal Husbandry Departments of various State Governments.

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#### 4. TRAINING AND BASIC RESEARCH

##### Training

Second Trimester final examinations for the M. Sc. and Ph. D. Courses were held. Half yearly examinations were held for the S.C.C. and P.S.C. Courses. During the quarter under review, 14 seminars were delivered by the scientists, students of the Institute on various topics of interest in the field of Agricultural Statistics. In spite of these, the following four seminars were also delivered by the eminent Scientists.

<i>Sl. No.</i>	<i>Speaker</i>	<i>Topic</i>
1.	Prof. J.N. Srivastava, Colorado State University, Fort colling, U.S.A.	Designing of multi-factor field experiments.
2.	Dr. P.G. Nair, Senior Scientist, National Dairy Research Institute, Bangalore.	Breeding dairy cattle for the tropics-The Indian Experience.
3.	Prof. Jagbir Singh, Temple University, U.S.A.	(i) Probability density function. (ii) Understanding 'R' Notation in regression.

#### 5. ADVISORY SERVICES

During the quarter under review, technical advice and guidance was rendered to research workers and students of the Research Institute, Agricultural Universities and other research organisations of planning of their experimental investigations and statistical analysis/computerisation of their research data as also in regard to research projects referred to the Institute by the ICAR and other organisations. Some details of the technical advice and guidance given by the Institute during the quarter under review, are given below in brief :

### **Sample Survey Methodology**

1. For the Seed Demand Survey being undertaken by Agricultural Finance Corporation (A.F.C.) gave advice on preparation of proformae and sampling design/sample size.
2. For Assessment Survey on Varah Bandi System in Hissar, gave advice to Ford Foundation.
3. Shri C.S. Tiwari, Chief Statistical Officer, Directorate of Veterinary Services, M.P. Bhopal and Shri Sudershan Kumar, Dy. Director (Statistics) Directorate of A.H., Punjab, Chandigarh in the planning and conduct of Sample Surveys for estimation of livestock products.

### **Statistical Genetics**

- Dr. Bruce Gilliver ICRISAT, Hyderabad in connection with the analysis of plant breeding data,
2. Dr. R.G. Dani, Cotton Geneticist, Akola, in connection with the analysis of plant breeding data.
  3. Dr. K.K. Ghosh, Statistician, Central Inland and Fisheries Research Institute, Barrackpore Calcutta, in connection with the analysis of inland fisheries data.
  4. Shri M.L. Mehra, Animal Geneticist, C.C.B. Farm, Suratgarh, in connection with the ranking of first set of Tharparkar bulls.

## **6. FIELD SURVEY WORK**

### **(a) Field Training**

During the quarter under review, field training was imparted in connection with the projects mentioned below at the places shown against them.

- (i) State level training programme for the scientists and staff working under All India Co-ordinated Agronomic Research Project (AICARP)-Patna (Bihar), Faizabad, Pantnagar (U.P.), Ropar, Amritsar (Punjab), Palampur (H.P.), Trichur (Kerala), Coimbatore (T.N.), Hyderabad (A.P.), Bhubaneswar (Orissa), Kalyani (W.B.), Gauhati (Assam), Imphal (Manipur) and Hissar (Haryana).



- (ii) Detailed training to field staff at Palampur, in the project pilot survey to study the performance characteristic of cross-bred cattle under village conditions, Palampur area, H.P.
- (iii) Imparted training to the staff in Hoshangabad district (M.P.) under the project pilot sample survey for developing a sampling methodology for estimation of livestock products on the basis of data collected as a part of the normal work of field agency of animal husbandry department.

**(b) Field Work Inspection/Supervision**

Field work inspection/supervision was carried out during the quarter under review in connection with the projects given below in the areas/places shown against them :—

- (i) Pilot sample survey to evolve a sampling methodology for estimation of cost of cultivation of important vegetable crops in the Union Territory of Delhi.
- (ii) Pilot sample survey to study the performance of cross bred cattle under village conditions in Palampur area (H.P.).
- (iii) Pilot sample survey for estimation of production of hides and skins in the districts of Agra and Kanpur (U.P.).
- (iv) Impact of Milk Supply Scheme on Rural Economy in milk collection area of G.C.M.S., Calcutta (W.B.)—Repeat Survey.
- (v) Pilot sample survey on cost of production of Mango/Banana and their marketing practices in Gujarat State.

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**7. ABSTRACTS OF PAPERS PUBLISHED**

1. CHOUDHRY, H. B. AND PANDEY R. K.—Study of marketable surplus of wheat in the union territory of Delhi.—*Agricultural Marketing, July, 1979.*

The purpose of this paper was to examine critically the marketed surplus of wheat on various holding size groups. Factors governing marketed surplus had been analysed. Study covered small, medium and large holding size groups of cultivators in Najafgarh block in the union territory of Delhi. Data pertained to year 1976-77.



It was observed that the surplus was mainly concentrated in the hands of big landlords. Variables affecting marketable surplus were total output, area under the crop and family size. These variable explained about approximately 80 percent of the variation in the marketed surplus.

2. IYER, V. N., SEHGAL, D. K. AND JHA, U. N.—Fertilizer use in rice cultivation-Cost benefit ratio-*Eastern Economist, New Delhi Vol. 76, No. 14, P.P. 914-916.*

A study on the cost benefit ratio at different levels of fertilization based on experiments conducted on rice during 1978-80 on cultivators' fields in the States of Andhra Pradesh, Karnataka, Tamil Nadu and Kerala showed that through balanced fertilization of N, P and K the farmers get higher Cost-benefit ratio's and in order to obtain maximum net return on investment toward fertilizers in any scheme of financial assistance, the aid to an individual cultivator will have the restricted to the cost of 40 Kg. nitrogen+20 Kg.  $P_2O_5$ +20Kg.  $K_2O$  per hectare. This would be the level at which the farmer can get maximum profit on every rupee he invests on fertlizer after repayment of loan provided for the purchase of fertilizer.

3. KAISTHA, A.C. AND GOEL, B.B.P.S.—Estimation of vegetable production using partial harvest data-*Jour. of I.S.A.S. Vol. XXXIII, No. a, April, 1981 P.P. 111-118.*

Available sampling techniques for estimation of production of vegetables involving large number of pickings entail collection of data for all pickings during the entire harvesting period. Besides introducing operational difficulties, this also increases the cost of the field work. The double sampling and component sampling approaches discussed in this paper not only overcome these drawbacks but also increase the efficiency of the estimates obtained. In double Sampling approach a large sample of fields is first selected for recording yield data for one picking/short interval and then a subsample of fields is selected for recording complete data. Using these data, a double sampling estimate is built up. In component sampling approach independent samples of fields are selected and yield for only one picking/interval is recorded for each of them. Estimates of average yield for each picking/interval are pooled to obtain estimate of yield over all pickings/intervals. Utilising the data for Bean/crop from the survey conducted by IASRI in Bangalore district (1971-72), sizes of large and sub-samples in double sampling and independent



samples in component sampling approaches have been determined for a given level of precision. The efficiency of these approaches has been compared with that of simple random sampling.

4. RAUT, K.C., SINGH, SHIVTAR, RUSTAGI, R.L. AND CHANDRA, VIMAL—Calf mortality affecting milk yield and some production traits of cows under village conditions—*Indian Dairymen*, Vol. XXXIII, No. 5, May, 1981.

A study has been carried out to show lactation length, lactation yield, yield per day of calving interval and persistency in milk yield of cows which completed their lactation with calves and those whose calves died during the lactation period, utilising data collected in a survey in Krishna Nagar area of West Bengal. About 31% cross-bred and 11% non-descript cows lost their calves due to mortality before completion of their lactation. The lactation length of a non-descript cow was 304 days when its calf was alive throughout the lactation and 196 days when calf died during the lactation. Calf mortality did not affect lactation length (352 days) of cross-bred cows. The lactation yield was 350 kg. for non-descript cow having calf and 218 kg. whose calf died. In the case of cross-bred cows, the lactation yield was 1032 kg. when the calf was alive during the lactation period and 835 kg. when the calf died. The persistency figures were less for cows without calves as compared to those having calves. This shows the desirability of having calf during the lactation under present management conditions in rural areas.

5. SARUP, SHANTI AND PANDEY, R.K.—Higher Rice Yield through Improved Practices in Puri District of Orissa—*Seeds and Farms*, Vol. VII, No. 3, March, 1981.

An attempt is made in this study to qualify the existing yield gap at micro level on rice farms having different patterns of adoption of modern technology. The selected farm households were classified into the five groups on the basis of number of improved practices adopted on their farms and the existing yield gap for each category was estimated. The behaviour of the yield gap among different category of farms revealed that it decreased as the farmers adopted more and more improved practices.

6. SARUP, SHANTI AND RAI, S.C.—Economic Analysis—Trends in Productivity of Jowar, Maize, Bajra—*Eastern Economist*, Vol. 76, No. 26, June 26, 1981.

This paper examines the trends in the yield rates of these crops during the period 1968-79. The main feature is a comparative study of growth rates



of these crops in their respective important growing states during fourth and fifth plan periods and also over the third plan period. The analysis suggests that plan efforts have succeeded in increasing the productivity of jowar in the States of Gujarat, Karnataka and Maharashtra. Comparing the productivity of jowar between 4th and 5th plans, it is observed that 5th plan performance is better than the 4th plan in most of the States. The productivity of maize and bajra had not shown any significant increase during the period under study.

7. MURTHI, T.A.V., AGARWAL, D.K., SAXENA, R.P., NAIR, G.R. AND KOTWAL, B.S.—Data Base for Enterprises—A Relation Approach—*Jour., SEDME, Vol. VIII, No. 2, June, 1981.*

Public enterprise today has assumed a significant position in the development of national economics. With a view to bring about rapid economic development and desired social change, most of the developing countries have resorted to State enterprise. And, in such circumstances comprehensive creation of public enterprise data base is a major task. The authors in this paper make an assessment of the financial performance of the public enterprises so as to create a data base for them. They also suggest means to improve the performance of the data base.

### 8. PAPERS ACCEPTED FOR PUBLICATION

1. AGARWAL, RANJANA AND JAIN, R.C.—Composite model for forecasting rice yield—*Ind. Jour. Agri. Sci., Vol. 52, No. 2, Feb., 1982*
2. ARORA, LOKESH AND SINGH, D.—Estimation of frequency distributions for the current occasion under successive sampling approach for some selected sampling designs—*Ind. Soc. of Agri. Stat., Vol. XXXIII (No. 1), April, 1981.*
3. CHAUDHARY, F.S. AND SINGH, D.—Acceptable Sequential Estimators of Population mean—*Ind. Soc. of Agri. Stat., Vol. XXXIII (No. 1), April, 1981.*
4. JAIN, J.P.—Methods for appraising progeny tests of dairy bulls under field conditions—*Ind. Jour. of Animal Genetics & Breeding,*



5. JAIN, J.P. AND JAIN, R.K.—Rates of genetic improvement under two schemes of progeny testing for cross-bred dairy herds of various sizes—*Ind. Jour. of Dairy Science*.
6. JHA, M.P, JAIN, R.C. AND SINGH, D.—Pre-harvest forecasting of sugarcane yield. *Ind. Jour. Agri. Sci.*
7. LAL, BASANT AND BHARGAVA, P.N.—A note on qualitative-cum-quantitative designs. *Jour. of Ind. Soc. of Agri. Stat.*
8. MARUTIRAM, B., NADKARNI, U.G. AND JAIN, T.B.—Sampling from fleeces for assessment of wool quality. *Jour. of Ind. Soc. of Agri. Stat.*
9. PRAKASH, ANAND AND BOKIL, S.D.—Stratification and estimation procedures in cultivated fodder surveys. *Jour. of Ind. Soc. of Agri. Stat.*
10. SAXENA, B.C., SINGH, H.P. AND LAL, KRISHAN—Effect of milk supply to urban milk schemes on fluid milk consumption in rural areas. *Ind. Jour. of Dairy Science*.

## 9. COMPUTER SCIENCE AND NUMERICAL ANALYSIS

### (i) Data Processing

During the quarter ending 30th June, 1981, the Division of Computer Science and Numerical Analysis continued to give facilities for data processing and Computer programming to the Scientists and Research scholars from various Institutes under I.C.A.R., Agricultural Universities, Colleges, Directorate of Economics and Statistics, Min. of Agri. and U.P. State Deptt. of Agriculture. A few non-agricultural users like D.C.M., N.P.L. and C.S.O. were allowed to use the Computer system on payment basis.

### (ii) Programming Facilities

During the quarter, 53 Ph. D., 33 M. Sc. and 24 other research scholars were given programming and data processing help.

### (iii) Computer Utilization

About 4700 production jobs and 700 testing jobs were undertaken on B-4700 system and IBM 1620 Computer.



**(iv) Software Development**

To meet the requirement of the research workers, 20 new computer programs were developed by the scientists of the Division. A few old programs were up-dated to suit the user's requirements.

**(v) Projects & User's Manual**

Most of the projects under taken by the scientists of the division has been completed and reports are being sent to external referees. A few "User's Manuals" for some important programs had been prepared by the scientists of the division for the benefit of the users.

**(vi) M.T. Unit**

About 3.5 lakh cards relating to various schemes of I.A.S.R.I. research scholars and other agencies were punched and verified during the quarter under report.

In addition about 645 jobs related with sorting, reproduction and testing were processed on various unit records machines during the quarter.

**(vii) Visits to the Computer Centre**

A batch of 25 B. Stat. and M. Stat. students from I.S.I., Calcutta visited the centre. The use of Computer in Agricultural Research was explained to them. The working of the two Computer Systems was also explained to them.

**(viii) Source-Program Library**

Source program library on Tape was up-dated with the addition of 14 new programs. List of new programs is given below :—

S. No.	Source file Name	Program Name	Author	Objective of Program
1.	LIB 217	DSPR 35	S.P. Doshi	Micro and Macro GXE interaction in T.T.C. Analysis.
2.	LIB 218	DSPR 60	..	Non. Hierarchical Euclidean Cluster Analysis.
3.	LIB 219	DSP 61	..	Estimation of Add-Bom. GXE, interaction, linkage and epistasis



				components and sequential Model fitting by least square technique.
4.	LIB 220	KCG 333	K.C. Gupta	Three-way cross analysis (Triallel Analysis).
5.	LIB 221	KCG 555	„	Stability analysis of Diallel set of data.
6.	LIB 222	RPJBPL	R.P. Jain	Program for listing a source program file on Disk in special format.
7.	LIB 223	DSPMPR	S.P. Doshi	Printing of elements of a matrix in a special format.
8.	LIB 224	DSPSCR	„	Calculation of vector of sums and matrix of corrected sums of cross products by the method of Youngs and Crammer.
9.	LIB 225	DSPTRN	„	Transformation of data matrix of correlated variables into a matrix of uncorrelated variables with unit variable.
10.	LIB 226	RBINOM	D. Jain	The evaluation of absorption probabilities in sequential binomial sampling.
11.	LIB 227	TRNGBN	„	Program for estimating the parameters of the truncated negative binomial distribution.
12.	LIB 228	KNOK	„	KNOK-test for space time clustering in Epidemiology.
13.	LIB 229	GAUINV	„	This finds the percentage points of the normal distribution.
14.	LIB 230	ART AUS	„	For the upper tail probabilities of Kendalls T (Toe).

### 10. PAPERS PRESENTED AT INTER-ORGANISATIONAL SEMINARS, WORKSHOPS, ETC.

The title and authorship of papers presented and the particulars of the workshops, seminars at which there were presented, are given below :

1. Seminar entitled "Policies related to breeding and feeding for milk production in operation Flood-II", held at National Dairy Development Board, Anand (Gujarat) from 9th to 11th April, 1981.

NARAIN, P.—Breeding plans for improvement of dairy cattle and buffaloes.

2. Mini Workshop on 'Statistical analysis of animal breeding data' held at I.A.S.R.I., New Delhi from 4th to 7th May, 1981.

(i) JAIN, J.P.—An approach for estimation of heterosis when performance of parents is not known.

(ii) JAIN, J.P.—Effect of non-normality on response to selection.

(iii) JAIN, J.P.—Methods for appraising progeny tests of dairy bulls under field conditions.

(iv) MALHOTRA, P.K.—A brief review of statistical techniques developed at the IASRI for efficient selection procedure in poultry breeding.

(v) NARAIN, P.—A generalised treatment of progeny testing and sire evaluation for milk production.

(vi) SINGH, H.P.—Biochemical Polymorphism and quantitative characters.

3. Annual Workshop of the National Demonstration Project at University of Agricultural Sciences Bangalore from 10th to 12th June, 1981.

PANDEY, R.K. and SARUP, SHANTI—Study of Socio-economic constraints in Paddy Production.

### 11. CONFERENCES/SEMINARS/SYMPOSIA/WORKSHOPS, ETC., ATTENDED BY THE SCIENTISTS

Date	Name of Seminar, etc.	Name of the Scientists with Designation.
March, 16th to April, 3	Summer Institute on 'Newer Concepts in nutrition and health and their implications for social policy by Maharashtra Association for the Cultivation of Science held at Pune, Maharashtra.	Sh. P.K. Malhotra, Scientist (S-1)



April, 9-11 & April, 13	Seminar on 'Policies related to breeding and feeding for milk production in operational flood-II' by the National Dairy Development Board held at Anand (Gujarat) and at Delhi.	Dr. P. Narain (Jt. Director).
May, 4-	Mini-Workshop on 'Statistical Analysis of Animal Breeding Data' held at IASRI, New Delhi.	Dr. P. Narain (Jt. Director) Dr. J.P. Jain, Scientist (S-3) Dr. H.P. Singh, Scientist (S-3) Shri S.C. Rai, Scientist (S-2) Shri P.K. Malhotra, Scientist (S-1) Shri V.K. Bhatia, Scientist (S-1)

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## 12. LIBRARY

- (a) During the quarter under report, 10 jobs covering 152 pages had been done on demand from scientific, technical and administrative officers of the Institute by the reprographic section of Library.
  - (b) In order to give maximum service of the Library to its users, the Library opening timings have been increased from 9.30 A.M. to 4.30 P.M. to 9.00 A.M. to 6.00 P.M. on all working days.
  - (c) A separate section has been created in the Library which is containing important official reference publications for reference and consultation.
  - (d) During the quarter under report, approximately 8,000 persons visited the library for consultation.
  - (e) The issue and return work at Library Counter involved transaction of 8050 publications.
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### 13. 'LAB TO LAND' PROGRAMME'

Under the I.C.A.R. Lab-to-Land Programme, the Institute carried out the following activities in the adopted village Garhi Randhala in Kanjhawala block of Delhi during the quarter under reference.

#### (i) Vocational Training of Village Youths and Women

Under the Vocational Training Programmes offered by the Delhi Administration, five youths belonging to the category of landless families received four months training in khadi weaving and one woman belonging to the category of marginal farmer was sent for vocational training of 6 months.

#### (ii) Population of vegetable cultivation

As a result of extension activities in the field of vegetable cultivation, the area under vegetables in the adopted holdings had risen from less than 1 acre before the implementation of the programme to more than 22 acres during the year.

The vegetable crops viz., Tinda, Tomato, Lady's finger, Tori-lauki and Musk Melon were sown after the harvest of wheat crop in the month of April, 1981. The seeds of these vegetables were supplied by the Institute excepting that of the Tori-lauki, which was supplied by B.D.O.

#### (iii) Animal Health Care

A few cases of Foot & Mouth disease were noted in the village in the month of April, 1981. Immediate action was taken to get the animals vaccinated against this disease through the local veterinary department. In all, 106 animals were vaccinated during the months of April and May, 1981.

#### (iv) Other Activities

As reported earlier, 57 demonstrations of  $\frac{1}{2}$  acre each were planned with two high yielding varieties, viz., H.D.-2004 and H.D.-2009. In addition to these varieties, the yield performance of other two varieties, viz., H.D.-1553 and W.L.-711 cultivated by the adopted farmers was also estimated.

The cultivators were eager to grow PS-16 variety of moong after the harvest of wheat crop, but the seed of this variety could be procured for an area of 3 acres only. Hence three cultivators have taken up the cultivation of summer moong during the summer season i.e. April-June, 1981.

Two demonstrations on reclamation of alkaline soils were conducted in the fields of two cultivators where barley was sown in those fields after treating the fields with gypsum and sweet water.



## 14. MISCELLANEOUS

### 1. Personnel Information

#### (a) Appointments, Promotions, Transfers, etc.

##### (i) Appointments :

Shri Durga Prakash appointed as Superintendent Audit and Accounts w.e.f. May 26, 1981.

##### (ii) Promotions :

Dr. H.P. Singh, Scientist S-2 promoted to S-3 grade of A.R.S.

##### (iii) Transfers :

Dr. D.V. Subba Rao, Scientist S-1 selected to the grade of Scientist S-2 at C.T.R.I., Rajamundry and relieved from I.A.S.R.I. w.e.f. May 6, 1981.

(iv) The following scientists S-1 have been transferred from IASRI to the place and date given against them :—

Sl. No.	Name of the Scientist	Place of Transfer	Date relieved from I.A.S.R.I.
1.	Shri R.P. Jain	C.S.W.R.T. Avikanagar	1.6.1981 (F.N.)
2.	Shri Jose Abraham	C.P.C.R.I. Kasargod	1.6.1981. (F.N.)
3.	Shri J.K. Kapoor	I.V.R.I. Izatnagar	1.6.1981 (F.N.)
4.	Shri Prabhat Kumar	—do—	25.6.1981 (A.N.)
5.	Shri U.N. Dixit	I.A.R.I. New Delhi.	1.6.1981 (A.N.)
6.	Miss Geeta Bisaria	—do—	1.6.1981 (F.N.)
7.	Shri R.C. Goyal	C.A.R.I. Izatnagar.	3.6.1981 (F.N.)

(v) Shri C.M. Saxena, Senior Computer has been inducted into Grade (S) of ARS in the pay scale of Rs. 550-900 and transferred to N.D.R.I. Karnal w.e.f. 20th June, 1981.

(vi) Shri Pradeep Behari, Senior Computer has been inducted into Grade (S) of ARS in the pay scale of Rs. 550-900 and transferred to I.G.F.R.I., Jhansi w.e.f. 30th June, 1981.

**(iv) Change in Head of Division**

The following change was affected from 11th May, 1981 :

<i>Sl. No.</i>	<i>Name of the Division</i>	<i>Out going Head</i>	<i>In coming Head</i>
1.	Animal Sciences	Dr. K.C. Raut	Dr. J.P. Jain

**(b) The Scientists of IASRI deputed to attend training/study tour/meetings and to deliver lectures etc. during April-June, 1981.**

- |                                     |   |
|-------------------------------------|---|
| 1. Dr. Daroga Singh,<br>Director.   | <ul style="list-style-type: none"> <li>(i) Went to Rome to attend the meeting of the F.A.O. Statistical Advisory Committee of Experts held from May 11-18, 1981.</li> <li>(ii) Attended the meeting of the committee of Direction to consider the report on Marketable Surplus and Post-Harvest Losses of Wheat in India of the Ministry of Rural Reconstruction on 20th May, 1981.</li> <li>(iii) Attended the meeting of the Technical Committee for consideration of items to be included in the Input Survey with 1981-82 as the reference year, of the census, Ministry of Agriculture on 2nd June, 1981.</li> </ul>   |
| 2. Dr. Prem Narain,<br>Jt. Director | <ul style="list-style-type: none"> <li>(i) Attended meeting on 15th April, 1981 in the Planning Commission in connection with the organisation of the XV International Genetic Congress to be held in 1983.</li> <li>(ii) Attended the Sectional Committee Meeting of the INSA on 20th and 21st April, 1981.</li> <li>(iii) Attended a meeting of the Bharat Science Foundation held in the premises of Rashtrapati Bhavan on 15th May, 1981.</li> <li>(iv) Attended a meeting of the Executive Council of the Indian Society of Agricultural Statistics on 21st May, 1981.</li> <li>(v) Attended a meeting of the Programme Committee of the XV International Genetic Congress to be held in India during 1983, on 23rd May, 1981 and 12th June, 81 at Indian Agricultural Research Institute, New Delhi,</li> </ul> |



- (vi) Delivered a series of six lectures on 'Human Genetics' in the Department of Biometry, Maharashtra Association for the Cultivation of Science, Pune from 29th June to 4th July, 1981.
3. Sh. S.K. Raheja,  
Scientist (S-3) Delivered a lecture to trainees from C.S.O. on 'Development of large scale sample surveys in the field of Agriculture and Animal husbandry'.
  4. Sh. P.N. Bhargava,  
Scientist (S-3) Delivered a lecture 'The activities of the Division of Statistical Research (Crop Sciences)' to the C.S.O. Trainees on 20th June, 1981.
  5. Dr. B.B.P.S. Goel,  
Scientist (S-3) Delivered a lecture on 'Sample Survey for estimation of livestock products' to the trainees of C.S.O.
  6. Dr. K.C. Raut,  
Scientist (S-3) As a member he attended the Executive Committee Meeting of the Indian Dairy Association, North Zone(West) & East Branches at New Delhi on 13th June, 1981.
  7. Miss. C.R. Leelavathi,  
Scientist (S-2) Delivered a lecture on 'Command Area Studies' to the students of J.C. Course of C.S.O. on 19th June, 1981 at I.A.S.R.I.
  8. Sh. P.C. Mehrotra,  
Scientist (S-2) Imparted training to J.C.C. Trainees from C.S.O. on 'Development of Methodology for large scale sample surveys in the field of Agriculture and Animal Husbandry.'
  9. Dr. Shivtar Singh,  
Scientist (S-1) (i) Delivered a lecture to the students of J.C. Course of C. S.O.  
(ii) Delivered a lecture to trainees from C.S.O. on 'Cost of rearing of calves' on 22nd June, at I.A.S.R.I.
  10. Sh. H.C. Jain,  
Scientist (S-1) Delivered a lecture on 'The broad outline of the project AICARP with stress on statistical aspects' to the students of J.C. Course of C.S.O.

11. Sh. K.B. Singh,  
Scientist (S-1) Delivered a lecture to C.S.O. trainees (J.C.C.) on 'Livestock surveys conducted by IASRI'.
12. Sh. V.N. Iyer,  
Scientist (S-1) Attended the I.C.A.R. Sub-Committee Meeting on "To finalise the future technical programme of AICARP relating to weedicide experiments" (Expt. No. 12 Series) on 26th June, 1981 at I.C.A.R., New Delhi.
13. Sh. R.K. Ghai,  
Scientist (S-1) Delivered a lecture to C.S.O. trainees (J.C.C.) on 'Activities of the agricultural experimentation' on 20th June, 1981.

**(2) Meetings**

<i>Date</i>	<i>Body</i>
(i) April 6th	Joint Council
(ii) April 7th and 16th	HDS. and Sr. Scientists
(iii) May 6th	Grievance Cell
(iv) May 21st	Sr. Officers
(v) May 23rd and 30th	HDS. and Sr. Scientists

**(3) Benevolent Fund Day**

The annual Benevolent Fund Day was observed on 30th June, 1981 at IASRI. A sum of Rs. 220.50 (Rupees two hundred twenty and paise fifty only) was contributed by the officers/staff of the Institute on that day.

**(4) IASRI Representatives at Scientific Panel/Meetings of ICAR**

<i>Name of the Officer</i>	<i>Name of Scientific Panel</i>
(i) Shri P.N. Soni	Scientific Panel on "Agronomy and Soil Science".
(ii) Shri B.C. Saxena	Scientific Panel on "Fisheries".

**(5) Other information**

Dr. D. Singh, Director was appointed member of an Advisory Committee for monitoring the progress of Seed Demand Study & Marketing Consultancy under National Seeds Project (NSP) in May, 1981.

He was also elected member of the "Society of Mathematical Sciences" Faculty of Mathematics, University of Delhi (Delhi).



Dr. Prem Narain, Jt. Director was appointed a Member of the ICAR Accreditation Team for starting of M. Sc. Course in Agricultural Statistics at the Bidhan Chandra Krishi Vishwa Vidyalaya, Haringhata, P.O. Mohanpur, Nadia (West Bengal). He was Co Chairman of one of the discussion groups of the Seminar entitled "Policies related to breeding and feeding for milk production in operation Flood-II" held at 'National Dairy Development Board', Anand, from 9th to 11th April, 1981.

He organised the Mini-Workshop on 'Statistical Analysis of Animal Breeding Data' at the I.A.S.R.I. from 4th to 7th May, 1981.

He acted as Director from 10th to 18th May, 1981 during the absence of regular Director, Dr. D. Singh, who went to Rome for attending a meeting of FAO Advisory by Statistical Experts.

He also held discussions with Professor P.V. Sukhatme, Maharashtra Association for the Cultivation of Science, Pune, regarding Nutritional Studies from 18th to 20th May, 1981.

Shri M.P. Jha, Scientist (S-3) gave a talk on the All India Radio on "Crop Forecasting Methodology" which was relayed under their Overseas programme on 13th & 14th May, 1981.

(c) **Fellowships, Honours, Awards, etc.**

**Fellowship**

<i>Sl. No.</i>	<i>Name of Course</i>	<i>Number of students</i>	<i>Rate of fellowship</i>
1.	Ph. D. Ist Year	3	Rs. 400/-
2.	Ph. D. Ist Year (ICAR Fellowship)	5	Rs. 600/-
3.	Ph. D. IInd Year	3	Rs. 400/-
4.	Ph. D. IInd Year (ICAR Fellowship)	1	Rs. 600/-
5.	Ph. D. IIIrd Year (ICAR Fellowship)	2	Rs. 700/-
6.	M. Sc. Ist Year	7	Rs. 300/-
7.	M. Sc. IInd Year	8	Rs. 300/-
8.	P.S.C. Course	10	Rs. 300/-
9.	Diploma	2	Rs. 400/-

### 15. मूंगफली की पोषक आवश्यकता :

खाना पकाने में मूंगफली का व्यापक उपयोग किया जाता है और यह विदेशी मुद्रा कमाने का भी माध्यम है, इस प्रकार इसे भारतीय कृषि अर्थव्यवस्था में एक महत्वपूर्ण स्थान प्राप्त है। यह कुल सस्य क्षेत्रफल के 4 प्रतिशत क्षेत्र में उगाई जाती है। अधिकतर यह अर्धसिंचित परिस्थितियों में उगायी जाती है और फसल के अधीन कुल क्षेत्र का केवल 7 प्रतिशत क्षेत्र ही सींचा जाता है। वर्षा-वृष्टि वाली फसल होने के कारण उपज-दर निम्न है और यह वर्ष-दर वर्ष अदलती-बदलती रहती है; तिलहन के अधीन कुल क्षेत्र का लगभग 50 प्रतिशत क्षेत्र मूंगफली के खाने में आता है जबकि उत्पादन में इसका योगदान लगभग 70 प्रतिशत है। आन्ध्र प्रदेश, गुजरात, कर्नाटक और तमिलनाडु मूंगफली का उत्पादन करने वाले प्रमुख राज्य हैं और इनमें मूंगफली के कुल उत्पादन का 75 प्रतिशत उत्पादन होता है। अकेले गुजरात में ही कुल उत्पादन का लगभग एक तिहाई उत्पादन होता है। गत दो दशकों के दौरान, क्षेत्र, उत्पादन और उत्पादकता की पैदावार दर, चावल और गेहूँ जैसी प्रमुख खाद्य फसल की तुलना में कम रही। तिलहन में 1960-61 से 978-79 की अवधि के दौरान मूंगफली उत्पादन की पैदावार-दर, तीरियाँ और सरसों (2:65) की तुलना में (0.94) कम थी।

विभिन्न राज्यों और सम्पूर्ण देश में क्षेत्र, उत्पादन और उत्पादकता में परिवर्तन पद्धति के निरीक्षण के लिए, वर्ष 1969-73 और 1974-78 की अवधि के दौरान वर्ष 1962-66 की अपेक्षा इन घटकों में प्रतिशत परिवर्तन प्राप्त किया गया है और नीचे सारिणी में प्रस्तुत किया गया है :—

सारिणी नं० 1 : विभिन्न राज्यों में वर्ष 1962-66 की अपेक्षा सन् 1969-73 और 1974-78 की अवधि में क्षेत्रफल उत्पादन और उत्पादकता में प्रतिशत परिवर्तन।

क्रम सं०	राज्य	1962-66 आधार वर्ष			1969-73 अवधि I		1974-78 अवधि-II	
		ए. (क्ष०)	1069	134.42	116.78	1974-78 अवधि-II	118.41	
1.	आन्ध्र प्रदेश	ए. (क्ष०)	1069	134.42	116.78			
		पी. (उ०)	755	152.19	139.47			
		प्र. (उत्पा०)	706	113.17	118.41			
2.	गुजरात	ए. (क्ष०)	1992	86.40	90.66			
		पी. (उ०)	1215	94.40	131.44			
		प्र. (उत्पा०)	610	109.18	142.45			



3.	कर्नाटक	ए. (क्षे०)	858	100.23	106.06
		पी. (उ०)	494	119.23	121.66
		प्र. (उत्पा०)	576	118.92	113.72
4.	महाराष्ट्र	ए. (क्षे०)	1083	75.53	76.82
		पी. (उ०)	645	74.11	89.15
		प्र. (उत्पा०)	595	98.15	116.13
5.	तमिलनाडु	ए. (क्षे०)	910	116.37	103.62
		पी. (उ०)	956	113.28	104.50
		प्र. (उत्पा०)	1051	97.34	100.67
6.	मध्य प्रदेश	ए. (क्षे०)	482	92.74	97.0
		पी. (उ०)	260	108.85	116.54
		प्र. (उत्पा०)	539	119.29	119.29
7.	उत्तर प्रदेश	ए. (क्षे०)	337	99.41	111.27
		पी. (उ०)	307	80.78	85.99
		प्र. (उत्पा०)	911	81.23	76.62
8.	समस्त भारत	ए. (क्षे०)	7147	100.67	100.48
		पी. (उ०)	4876	112.57	121.43
		प्र. (उत्पा०)	682	111.58	120.82

निर्देशिका : ए. (क्षे०)—औसत क्षेत्र, 000 हेक्ट० में  
 पी. (उ०)—प्रतिशत उत्पादन, 000 टनों में  
 प्र. (उत्पा०)—उत्पादकता, कि० ग्रा०/हेक्ट० में

राष्ट्रीय स्तर पर उत्पादन में एक बढ़ती हुई प्रवृत्ति देखी गयी। अवधि-II के दौरान उत्पादन स्तर 1962-66 की अपेक्षा 20 प्रतिशत बढ़ा। यह मुख्यतः उत्पादकता में सुमेलन वृद्धि के कारण है। पुरे समय में देश में कुल सस्य क्षेत्र में कोई परिवर्तन नहीं हुआ। आधार वर्ष के बाद अवधि-I और अवधि-II के दौरान क्षेत्र, उत्पादन और उत्पादकता में परिवर्तन की पद्धति





/हैक्ट० डालने पर निम्न साधारण अनुक्रिया प्राप्त हुई, जबकि तमिलनाडु में लगभग 3 क्वि०/हैक्ट० की अनुक्रिया थी। N, P के स्तर बढ़ाने पर सभी राज्यों में अनुक्रिया में साधारण वृद्धि हुई है। 30 से 45 कि० ग्रा०  $P_2O_5$ /हैक्ट० के हिसाब से अकेले P डालने पर अधिकांश राज्यों में अनुक्रियाएं अकेले N डालने की तुलना में अधिक थी। जबकि केवल तमिलनाडु में यह वृद्धि बहुत कम हुई। उड़ीसा और आंध्र प्रदेश में क्रमशः 3.2 और 5 क्वि०/हैक्ट० की अच्छी अनुक्रियाएं देखी गयीं और शेष राज्यों में अनुक्रियाएं 2 क्वि०/हैक्ट० से कम थी। 10 से 20 कि० ग्रा० N/हैक्ट० + 30 से 45 कि० ग्रा०  $P_2O_5$ /हैक्ट० का उर्वरक मिश्रण डालने पर उड़ीसा और तमिलनाडु में क्रमशः 5.5 और 4.9 क्वि०/हैक्ट० की अनुक्रिया उच्च थी। आंध्र प्रदेश (खरीफ), गुजरात, कर्नाटक, मध्य प्रदेश, महाराष्ट्र और राजस्थान में अनुक्रियाएं 3 से 4 क्वि०/हैक्ट० तक बदलती-बदलती रही। भिन्न भिन्न तरह के उर्वरक डालने पर सभी स्थितियों में कुल वापसी पर्याप्त थी। सभी राज्यों में 10 से 20 कि० ग्रा० N/हैक्ट० + 30 से 45  $P_2O_5$ /हैक्ट० का मिश्रण डालने से प्राप्त वापसी अकेले N और P डालने की तुलना में कुल वापसी पर्याप्त रूप से उच्च थी। अधिकांश स्थितियों में लागत के लाभ का अनुपात भी 3 से अधिक था। उड़ीसा में 6 के क्रम की बहुत ऊंची लागत के लाभ का अनुपात और बाद में तदनुसार 8 का अनुपात आंध्र प्रदेश में प्राप्त हुआ।

सारणी सं० 2 :—

कृषकों के खेतों पर आयोजित प्रयोगों के आधार पर मूंगफली (असिंचित) के लिए उर्वरक अनुक्रिया (कि० ग्रा०/हेक्ट०) कुल वापसी (रु०/हेक्ट०) और लागत के लाभ का अनुपात ।

क्र० सं०	राज्य (मौसम)	नियंत्रण (बिना उर्वरक वाला खेत)	डाले गये उर्वरकों की दरें				
			5 (नाइट्रोजन) ग्र	6 (फास्फोरस) ब	7 (ना०) अ व	8 (फास्फोरस) अ स	
1.	आन्ध्र प्रदेश (खरीफ)	अनुक्रिया	782	78	125	236	233
		कुल वापसी		2512	2515	2780	2592
		वापसी/रु०		3.47	1.81	2.59	1.54
2.	आन्ध्र प्रदेश (रबी)	अनुक्रिया	836	245	392	786	816
		कुल वापसी		3175	3478	4592	4503
		वापसी/रु०		10.89	5.70	8.61	5.41
3.	गुजरात (खरीफ)	अनुक्रिया	839	186	145	321	563
		कुल वापसी		3007	2746	3206	3753
		वापसी/रु०		8.27	2.11	3.52	3.73
4.	कर्नाटक (खरीफ)	अनुक्रिया	983	237	167	329	547
		कुल वापसी		3592	3244	3662	4137
		वापसी/रु०		10.53	2.43	3.61	3.63
5.	मध्य प्रदेश (खरीफ)	अनुक्रिया	730	164	132	340	502
		कुल वापसी		2614	2380	2936	3243
		वापसी/रु०		7.29	1.92	3.73	3.33
6.	महाराष्ट्र (खरीफ)	अनुक्रिया	1040	178	249	365	476
		कुल वापसी		3586	3661	3941	4095
		वापसी/रु०		7.91	3.62	4.00	3.16



1	2	3	4	5	6	7	8
7.	उड़ीसा (खरीफ)	अनुक्रिया कुल वापसी वापसी/ह०	881	147 3016 6.53	3.18 3.91 4.63	550 4019 6.03	782 4536 5.18
8.	राजस्थान (खरीफ)	अनुक्रिया कुल वापसी वापसी/ह०	491	184 1957 8.18	1.39 1684 2.02	357 2270 3.91	277 1851 1.84
9.	त्रिपुरा (खरीफ)	अनुक्रिया कुल वापसी वापसी/ह०	1377	257 4834 11.42	4.99 4522 7.26	744 6089 8.15	— — —
10.	तमिलनाडु (खरीफ)	अनुक्रिया कुल वापसी वापसी/ह०	1298	193 4405 8.58	1.15 4033 1.67	336 4628 5.68	386 4599 2.56
11.	तमिलनाडु (रबी)	अनुक्रिया कुल वापसी वापसी/ह०	1289	30 4759 14.22	1.01 3964 1.47	490 5063 5.37	5.78 5148 3.83

निर्देशिका :— (नाईट्रोजन)<sub>अ</sub> = नाईट्रोजन की 10 से 20 कि०ग्रा०/हेक्ट०, मात्रा

(फासफोरस)<sub>ब</sub> = P<sub>2</sub>O<sub>5</sub> की 30 से 45 कि०ग्रा०/हेक्ट०, मात्रा

(नाईट्रोजन)<sub>अ</sub> (फासफोरस)<sub>ब</sub> = 10 से 20 कि०ग्रा०/हेक्ट० N + 30 से 45 कि०ग्रा०/हेक्ट० P<sub>2</sub>O<sub>5</sub> का मिश्रण

(नाईट्रोजन)<sub>अ</sub> (फासफोरस)<sub>स</sub> = 10 से 20 कि०ग्रा०/हेक्ट० N + 60 से 80 कि०ग्रा०/हेक्ट० P<sub>2</sub>O<sub>5</sub> का मिश्रण

एक कि० ग्रा० मूंगफली का मूल्य = रु० 3.00

एक कि०ग्रा० N पोषक का मूल्य = रु० 4.50

एक कि०ग्रा० P<sub>2</sub>O<sub>5</sub> पोषक का मूल्य = रु० 5.50





विधि लागू करने के प्रयास किये । 1944 में एटा (उ० प्र०) के बकरी प्रजनन परियोजना पर पहली बार, पशु विज्ञान में सांख्यिकीय विधि लागू करने की प्रावश्यकता की मान्यता के लिए, 10 वर्षों के सांख्यिकीय विश्लेषण का कार्य हाथ में लिया । तब से पशुओं के भूण्डों में श्रनुवांशिक ढांचे के मूल्यांकन में संस्थान ने श्रभूतपूर्व योगदान दिया है । इसके परिणामस्वरूप मूयु एवं उर्वरता दरों साथ ही जैव लक्षणों की श्रौर लगभग सभी शुद्ध वंश एवं संकर-नरल के भारतीय पशु, भैंसों, मुर्गियों, भेड़ श्रौर बकरियों के भूण्डों के लिए वंशागतित्व, पुनरावृत्ति श्रौर श्रनुवांशिक सहसंबन्धों जैसे श्रनुवांशिक प्रचालनों की भी जानकारियाँ उपलब्ध हो गयी हैं ।

4. बंगाल के श्रकाल के उपरान्त संस्थान के क्रियाकलापों ने एक नये चरण में प्रवेश किया । भारत सरकार ने यादृच्छिक प्रतिचयन की विधि के आधार पर उद्देश्यपूरक सर्वेक्षणों के श्रायोजन द्वारा फसलों के उपज श्रांकड़े एकत्रित करने की विधियों का श्रनुसंधान कार्य हाथ में लेने का निदेश दिया । यह कार्य सुपुर्द करने के परिणामस्वरूप, फसल कटाई सर्वेक्षणों द्वारा उपज के श्रनुमान लगाने की विधि के लिए यादृच्छिक प्रतिचयन विधि के उपयोग का विकास हुआ जिसकी दक्षता एवं व्यवहारिकता का विभिन्न राज्यों में प्रदर्शन किया गया । जो सफलता इस विधि ने प्राप्त की वह ऐसी थी कि कुछ ही वर्षों में यह विधि समस्त देश में श्रौर सभी प्रधान खाद्य फसलों में व्यवहारिक रूप से फैल गई । 1956 से, प्रधान पशुधन उत्पादों श्रौर संस्था के उत्पादन श्रकालनों के लिए उपयुक्त प्रतिचयन क्रिया—पद्धति को शामिल किया गया । देश में फलों श्रौर शाक सब्जी के उत्पादनों के श्रकालन हेतु प्रतिचयन पद्धति ने जिला कृषि विकास कार्यक्रम, उच्च पैदावार वाली किस्मों के कार्यक्रम इत्यादि जैसे कृषि विकास कार्यक्रमों के सर्वेक्षण कार्यों को भी हाथ में लिया । नवीन कृषि नीति के विश्लेषण का कार्य श्रौर उपज-रिवित निर्धारित करने का काम भी हाथ में लिया गया श्रौर उच्च उपजों के समाज—श्रांशिक व्यवरोध बनाने गये हैं । संस्थान ने पशुधन उत्पादों जैसे—दूध, ऊन, मुर्गी एवं श्रण्डों की लागत के श्रकालन के लिए उपयुक्त प्रतिचयन विधि का भी विकास किया है । श्रौसत दुग्ध दोहन श्रौर पूर्वानुमान के पर्याप्त स्तर सहित वार्षिक दुग्ध उत्पादन के विश्वसनीय श्रकालन प्राप्त करने हेतु मूल ग्राम खण्डों में दुग्ध दर्ज करने के लिए समुचित प्रतिचयन योजना का विकास किया गया ।

5. लगभग ढाई दशक पूर्व 'कृषि क्षेत्र प्रयोगों की राष्ट्रीय सूची' शीर्षक से एक योजना चालू के गयी । 1948-65 के प्रयोगों के परिणाम तीन ग्युंखलाश्रों में सार-संग्रह खण्डों के रूप में प्रकाशित किये गये हैं । 1966 श्रौर उससे श्राने के प्रयोगिक श्रांकड़ों को "कृषि क्षेत्रीय प्रयोगों की सूची" की 6 ग्युंखलाश्रों में प्रकाशित किया गया है जिसमें फसल उद्देश्य, वर्ष श्रौर वर्षों के चालू होने श्रौर समाप्त होने के साथ-साथ प्रयोगों के स्थान दिये गये हैं । श्रनुसंधान-कर्मियों के लाभ के लिए "पशु प्रयोगों की राष्ट्रीय सूची" शीर्षक से एक योजना का कार्य हाथ







गठ विमर्शों अथवा, अर्थात्, 1981 से जन, 1981 में हिन्दी गद्यन के प्रसार में मासिकी का एक दैखन में आया। यह एक दस मासिक में गठी कि हिन्दी का गद्यन कम हुआ हो, बल्कि हिन्दी का गद्यन दस सत्रयन में निरिधत रूप से बढ़ा परन्तु अन्य विमर्शों की अधिका कम। जन माह में निरीक्षण समाप्ति के निरीक्षण से आत हुआ कि कुछ अधिका हिन्दी विपणियों एवं मासिकी में अन्विष्ट दिखता रहे है जिससे अधिनरय कर्मचारियों में हिन्दी के प्रति उत्साह कम होना स्वाभाविक है। निरीक्षण के दौरान दैखन में आया कि कुछ हिन्दी विपणी के नीचे अधिका हि

### 17. हिन्दी गद्यन विपण

कम सं०	वर्ग	रुपय संख्या
1.	वैज्ञानिक	138
2.	तकनीकी सेवा स्टाफ	305
3.	प्रशासनिक स्टाफ	101
4.	सहायक कर्मचारी श्रेण	81
	कुल	625

9. संस्थान काल्पन कर्मचारियों की संख्या 1-1-1981 के अनुसार 625 है जो निम्न

रुपय संख्या के अधिनरय एक अन्य श्रेण, निदेशक श्रेण, 1973 से कार्य कर रही है। 1979 के दौरान संस्थान में एक मासिकीय श्रेण का गठन किया गया, जो नवम्बर, 1979 से कार्य कर

- (क) फसन प्रवर्धन पद्धति प्रयोग।
- (ग) पूर्ण विज्ञान में सांख्यिकीय अनुसंधान प्रयोग।
- (घ) सांख्यिकीय अनुसंधानिक प्रकक।
- (ङ) गतिशील संवर्धन पद्धति प्रयोग।
- (च) अध्यात्मिक विज्ञान प्रयोग।
- (छ) प्रशिक्षण एवं मासिक अनुसंधान प्रयोग।
- (ज) संयुक्त विज्ञान एवं सांख्यिकीय विज्ञान प्रयोग।

गण श्रंग्रेजी में टिप्पणी लिख देते हैं। अतः इस संदर्भ में निरीक्षण समिति के श्रधिकांरियों ने उसी समय हिन्दी के प्रति उत्तर में श्रंग्रेजी लिखने वाले श्रधिकांरियों से श्राग्रह किया कि हिन्दी के प्रति उत्तर में हिन्दी ही लिखी जाए तथा ऐसे पत्र जो विशेषकर "क" और "ख" क्षेत्रों में भेजे जाते हैं हिन्दी में ही भेजे जाएं। अगर ऐसा नहीं किया जाता है तो राजभाषा श्रधिनियम का उल्लंघन होगा।

गत तिमाही में संस्थान में प्रचलित क्रिये जाने वाले केवल हिन्दी के परिपत्र, ज्ञापन इत्यादि की संख्या में लगभग 8 प्रतिशत की वृद्धि हुई है और इसके श्रतिरिक्त कुछ ऐसे भी परिपत्र इत्यादि है जिनका द्विभाषी रूप में प्रचलन लगभग 10 से 15 प्रतिशत तक बढ़ा है।

जहाँ तक कर्मचारियों में हिन्दी के प्रति रुचि बढ़ाने का प्रश्न है, उसमें कार्यशाला के अन्त में 1 मई, 1981 की हुई सामान्य हिन्दी की परीक्षा और उसके परिणाम ने बड़े मार्कों का काम किया है। जहाँ पहले स्वयं जा-जा कर प्रशिक्षार्थियों के नाम जुटाने पड़ते थे अब कर्मचारी स्वयं ही श्रागामी कार्यशाला जिसका श्रायोजन संभवतः नवम्बर, 1981 में किया जाएगा में अर्पने-अर्पने नामों का प्रस्ताव रख रहे हैं। उक्त परीक्षा में 24 प्रशिक्षार्थियों ने हिस्सा लिया उनमें से तीन महिला प्रशिक्षार्थी कुमारी टी. विजया लक्ष्मी, कुमारी हरिन्दर कौर और श्रीमती शकुन्तला श्रोत्रवा ने क्रमशः प्रथम, द्वितीय एवं तृतीय स्थान प्राप्त किये। बड़े हर्ष की बात है कि एक दक्षिण भारतीय लड़की को बड़ी श्रच्छी हिन्दी लिखकर प्रथम स्थान प्राप्त करने का सौभाग्य प्राप्त हुआ।

संस्थान में हिन्दी के प्रयोग को बढ़ाने में यहाँ के श्रधिकांरियों एवं कर्मचारियों का सहयोग मिल रहा है, जिससे संस्थान में हिन्दी के प्रयोग में प्रसार हुआ है। श्राशा है कि श्रागामी तिमाही में इसका प्रसार इस तिमाही के श्रपेक्षाकृत श्रधिक ही होगा।

अनुवादक : श्री श्रखिलेन्द्र पालसिंह

निरीक्षक : सर्व श्री महाराज स्वर्ण

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