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Dr. Deshmukh lays stress on

Orderly marketing and grading of Agricultural produce

"An efficient system of marketing is of critical importance to a country under all conditions and at each stage of its development," said Dr. Panjabrao Deshmukh, Union Minister of Agriculture, on August 26, 1961, while inaugurating the Regional Control Laboratory at Guntur, which is one of the chain of control laboratories being set up by the Directorate of Marketing and Inspection in the Ministry of Food and Agriculture in different parts of the country. He further said :

In a country where seven out of every ten persons depend upon agriculture and nearly half of the national income is derived from this source, we cannot afford to be complacent about the existing bewildering conditions prevailing in the field of marketing of agricultural produce, except at great peril to our economy. Orderly marketing boosts up production by ensuring better returns and thus providing a *raison d'etre* for toiling millions engaged in this oldest profession of man on earth. When the bulk of our producers live on subsistence level, raising their income calls for expeditious development of new marketing channels and handling methods.

Out of an average of Rs. 620 crores of our annual foreign exchange earnings, over Rs. 290 crores are derived from exports of agricultural and livestock products. As agricultural commodities hold a place of pride in our export trade, all-out efforts are necessary to promote their exports to cope with the

requirements of a developing economy.

In the development of orderly marketing, standardisation and grading play a pivotal role as they constitute the basic factors in almost all transactions. Grading provides a common language understood and used by buyers and sellers, as a basis of judging the quality of a product in relation to its price. It is a matter of experience that absence of uniform quality standards has always resulted in waste, and exports of ungraded and unmarked agricultural commodities have brought a bad name to the country reducing thereby our national earnings in foreign exchange.

A landmark was made in the history of marketing in this country in 1937 when the Agricultural Produce (Grading and Marking) Act was passed, which authorised the Government of India to prescribe grade standards for various agricultural, livestock and horticultural commodities and promote grading of these commodities. Considerable progress has been made during the last 24 years in the field of grading. At present over Rs. 43 crores worth of commodities are being packed and marked under 'Agmark' both for the internal trade on a voluntary basis as well as for the export trade on a compulsory basis. Ghee, vegetable oils, rice, gur, wheat atta, fruits and vegetables, honey and eggs are being graded for the consumer within the country on a voluntary

basis; while sann hemp, tobacco, wool, bristles, goat hair, lemon-grass oil and sandalwood oil are being graded for the export trade on a compulsory basis. Grading of another essential oil, namely, Palmarosa oil, is being taken up on compulsory basis for export from 29th of August 1961. In pursuance of the recommendations of the Planning Commission, it is further proposed to take up compulsory grading for export of other agricultural and livestock products like vegetable oils and oilseeds; pepper, ginger, turmeric, and cardamom; cashew kernels; chillies and curry powder; myrobalans etc. It will thus be observed that the tempo of standardisation and grading under the Agricultural Produce (Grading and Marking) Act is being steadily accelerated.

At present, out of a total of 105 Grading Laboratories, 18 have been set up by State Governments, 8 by Co-operatives, one by a packers' association and 78 by individual packers. I understand that of the State Grading Laboratories in the Southern Region, 7 have been set up by the Madras State and 2 by the Mysore State. In view of the importance of the ghee and vegetable oils trade in Andhra Pradesh and Kerala, I would very strongly urge these State Governments to set up similar laboratories at the earliest. The Government of India have agreed to meet the non-recurring expenditure on such laboratories on a 50 : 50 basis during the III National Plan.

Sprinkler Irrigation will Increase Food Production

The Agricultural programme for the Third Five Year Plan aims at raising the overall level of production by 30 to 33 per cent and the internal production of food grains to about 100-105 million tons by 1965-66.

The Plan lays emphasis on four principal technical programmes : (i) irrigation ; (ii) soil conservation and dry farming ; (iii) supply of fertilisers and manures ; and (iv) production and distribution of improved implements.

The major and minor irrigation schemes proposed to be taken in hand during the Third Plan period are expected to provide adequate water supply to an additional 26 million acres. However, it has been observed that the facilities for irrigation created by big projects have not been fully utilised by farmers in many areas for one reason or the other. In view of the urgency of increasing the output of foodgrains in the shortest possible time, minor irrigation projects yielding immediate results to farmers would be the obvious choice.

Irrigation is an old practice—perhaps as old as agriculture itself. Better and effective use of available water forms an essential part of efficient farming. Crops can be raised successfully and economically by resorting to improved tillage, seeds, rational application of fertilisers, effective methods of pest control and uniform and timely application of soil moisture. Deviation in any or all these factors may adversely tell on the normal growth of the crop.

While research has been and is being done in the fields of improved tillage implements, seed, cultural practices and pest and weed control to enhance the progress of agriculture, the irrigation aspect of it does need a little more emphasis. As every farmer is aware, surface method of irrigation does not render utility of available water to its fullest extent, as most of the water is lost underground by seepage. A lot of it is also evaporated and the rest,

though in the soil, may not be available to the plants as it falls beyond the rootzone of the crop.

Besides, surface irrigation deprives the plants of its food nutrients in the soil since they are carried away by the force of the running water. For surface irrigation, fields must be properly levelled, which involves considerable expenditure. Valuable cultivated area is also occupied by water channels, drains, etc. Thus total production is decreased.

Irrational use of irrigation water has resulted in complete loss of about five million acres of land in this country due to water-logging, etc. Moreover, vagaries of the monsoon are well-known. Drought years are a curse and challenge to modern technological developments. So arises the vital need for man-made rain.

SIMPLE PROCESS

The sprinkler method of irrigation consists of a simple process of conveying irrigation water under pressure through the sprinkler nozzles in the form of spray similar to natural rain. The entire system consists of a pumping unit involving a high-head centrifugal pump, aluminium irrigation pipes and accessories and sprinkler heads with different sizes of nozzles.

The quantity of water discharged through nozzles under different pressures is calibrated and the precipitation rate can be predetermined. The aluminium tubings are light in weight, non-corrosive, durable and coupled together by means of quick-acting couplers. The prime-mover can be either a high-speed diesel engine or an electric motor.

Sprinkler systems are designed to meet individual requirements and vary from one individual to another, depending on the size of the plot, source of water or precipitation rate. Permanent installations are costly while portable units are convenient and economical to operate.

The advantages of artificial rain-making are enumerated below :—

- 1 No more dependence on rains —“rain-to-order” of your own !
- 2 Utilisation of water by crops could be increased from 29 per cent to 82 per cent.
- 3 25 per cent to 50 per cent saving can be effected in irrigation water.
- 4 Intensity of water applied can be adjusted according to crop requirements to suit moisture intake of the soils—a measured dosage.
- 5 Topography of land offers no problems.
- 6 More than one crop can be grown since moisture conditions are assured.
- 7 Effective control of crop-pests is possible at no extra cost, since fertilizers or chemicals can be sprayed simultaneously with irrigation.

It is true that every irrigated acre cannot be economically sprinkler-irrigated, but there are special conditions obtaining in our country which warrant much more usage and attention than has hitherto been attached.

There will be colossal savings in end use of water in light soil areas such as the Kosi Belt and the Rajasthan Canal area. India can also prevent a rise in the water table and consequent water-logging of vast tracts in areas of light soils and high-water tables such as in Uttar Pradesh and Punjab.

India's foreign exchange earners like tea and coffee are grown on steep slopes where no other form of irrigation can be practised except sprinkler. These important crops can be saved from drought-visitations. There are also areas where water is scarce for irrigation of agricultural crops, orchards, etc. By saving water, we can bring more land under irrigation.

(Reproduced from an article by Shri B. K. S. Jain, M. Agr. Sc. Melbourne.)

Published in the *Financial Express* of July 17, 1961.

Prime Minister Bakshi will address the 12th A.I. Farmers' Council Meeting in Srinagar

SADAR-I-RIYASAT

to inaugurate on October 8

Sadar-i-Riyasat, Jammu and Kashmir, Yuvraj Karan Singh will inaugurate the 12th Meeting of All-India Farmers' Council at Tagore Hall, Srinagar, on October 8, 1961.

The main feature of the meeting will be discussion of the Third Five-Year Plan with a 'farmers' point of view'. Over two hundred farm leaders and experts from all parts of the country are expected to take part in the deliberations. Programme of the Bharat Krishak Samaj for the year 1962 will also be discussed.

Prime Minister of the Jammu and Kashmir State, Bakshi Ghulam Mohammed will address the Council Meeting on October 10, 1961.

The following are the details of the programme of meetings :

PROGRAMME

Friday, October 6, 1961

3.00 p.m.

(1) Registration of delegates begins.

(2) Meeting of State Secretaries of the Bharat Krishak Samaj.

Saturday, October 7, 1961

9.00 a.m.

Registration of delegates continues.

3.00 p.m.

Meeting of the Governing Body of the Bharat Krishak Samaj.

Sunday, October 8, 1961

10.00 a.m.

Inauguration of the 12th meeting of the Council by Yuvraj Karan Singh, Sadar-i-Riyasat, Jammu and Kashmir.

10.30 to 11.00 a.m.

Address by Dr. Panjabrao Deshmukh, President, Bharat Krishak Samaj.

11.00 to 11.15 a.m.

Report of the Secretary, Bharat Krishak Samaj.

11.15 a.m. to 1.00 p.m.

Meeting continues.

3.00 p.m. to 6.00 p.m.

Meeting continues.

Monday, October 9, 1961

10.00 a.m.

Address by Bakshi Ghulam Mohammed, Prime Minister of Jammu and Kashmir.

10.00 a.m. to 1.00 p.m.

Meeting continues according to Agenda.

3.00 p.m. to 6.00 p.m.

Meeting continues according to Agenda.

Tuesday, October 10, 1961

10.00 a.m. to 1.00 p.m.

Concluding Plenary Session.

3.00 p.m.

Meeting of the Governing Body of the Agricultural Machinery Association.

Wednesday, October 11, 1961

Sight-Seeing.

Pests and Diseases

Seminar on Plant Protection

There was a very important seminar on Plant Protection, which discussed the following subjects :

- 1 Ways and means of intensifying plant protection work and the role of Panchayat Samitis etc., in furthering this work.
- 2 Organizing campaigns against important pests and diseases.
- 3 Popularisation of plant protection measures through publicity and demonstration.
- 4 Training in plant protection to officials and non-officials.
- 5 Role of Panchayat Samitis and Co-operative Societies and other agencies in the stocking and sale of pesticides and plant protection equipment.

The seminar was held from the 26th to 28th July, 1961 at Jaipur and was attended by some 120 delegates. The representation was all-sided as it contained representatives of the distributing firms, scientists, officers, entomologists, registrars and deputy registrars of cooperatives, plant protection officers, Locust Warning officers as well as B.D.Os, Agricultural Extension Officers and even Village Level Workers. The main recommendations of this seminar are given below :—

(1) Realizing the importance of the educational aspect of plant protection and with a view to motivating the farmer to take up plant protection measures on his crops as a regular farm practice, this seminar recommends that the plant protection and other development staff should intensify their efforts for educating the farmers about plant protection and create in them the awareness of the feasibility of plant protection measures for saving their crops from pests and diseases.

(2) In order to cope with the increasing tempo of plant protection activities in the State, Plant Protection Organisation should be strengthened and expanded. The

seminar suggests that this organization should be under the charge of a Plant Protection Officer in Class I Service of the State, as is the case in some other States.

(3) Nutritional deficiency diseases, especially those due to trace elements, are of particular importance in Rajasthan. The seminar recommends that the problem should be studied in detail for evolving suitable remedial measures. The treatments for correcting zinc deficiency in guava and copper and zinc deficiencies in citrus should be made more popular.

(4) The seminar unanimously agrees that a director in the regional language giving local names of different pests and diseases occurring on various crops in the State should be prepared and made available to the field workers and others.

(5) Demonstration is an effective means of convincing the farmer of the benefits of improved agricultural practices. At present no funds are available for demonstrating pest and disease control measures. Adequate funds should, therefore, be made available for conducting demonstrations to show the effectiveness of plant protection measures.

(6) Realizing the benefits of seed treatment for control of certain seed-borne diseases, the seminar recommends that seed distributed to farmers should be treated with seed dressers, and the farmers should also be persuaded to treat their own seeds as a regular farm practice.

(7) Certain pests and diseases such as citrus psylla, striga in *bajra* and ergot disease of *bajra* are of localised occurrence in the State. The State Government should enforce strict plant quarantine measures to prevent the spread of such pests and diseases, if not to eradicate them completely.

(8) Facilities should be created for servicing and proper maintenance of plant protection equipment.

(Continued on page 7)

Livestock Population

The figures of livestock census taken in April 1961 for three more States of Uttar Pradesh, Maharashtra and Madras have now been released. In U.P. the total livestock population has increased by 15.7 per cent, in Maharashtra by 10.9 per cent and in Madras by 6.38 per cent since the last quinquennial census in 1956. The number of cattle in U. P. has gone up by 14.4 per cent, buffaloes by 12 per cent and sheep by 29.3 per cent. It is gratifying that the number of goats has fallen by 15.4 per cent and poultry has shown a remarkable rise of 57.4 per cent.

In Maharashtra, buffaloes have increased by 15.3 per cent while horses and ponies have fallen by 20.4 per cent. Poultry has shown an increase of 21.4 per cent which is not so satisfactory probably because the consumption in Bombay must have increased by a corresponding increase in its population. The non-availability of tractors appears to have been reflected in the fall of a number of tractors in Maharashtra from 2,066 to 1,115.

In Madras the percentage of buffaloes has increased by 26.11 per cent, viz., from 20.41 lakhs to 25.74 lakhs. The number of horses and ponies has fallen by 14.40 per cent and poultry has shown a very insignificant rise of 8.44 per cent. The number of tractors has increased from 822 to 1390.

The Union Territories, however, have a different story to tell. Cattle population has gone down by as much as 25.8 per cent and buffaloes stated to have decreased from 1,15,000 to 61,000, which means a fall of 47.5 per cent. In Delhi, the livestock population has fallen by 12.6 per cent, i.e. from 3,06,000 in 1956 to 2,68,000 in 1961.

Official estimates of some crops

Gram production in the year 1960-61 as reported in the All India Final Estimates shows a remarkable increase by 12.8 per cent in production although the acreage has gone down by 7.4 per cent. The following are the actual figures :—

Year	Area	Production
1960-61	23,483,000 acres	62,07,000 tons
1959-60	2,53,72,000 „	55,02,000 „

There is thus a decrease of 18,89,000 acres in area while the increase in production is 7,05,000 tons.

Rapeseed and mustard is another crop which has hit a very high mark of production in the year 1960-61. From 72,65,000 acres 12,80,000 tons were produced this year as against 10,47,000 tons produced in 71,51,000 acres in 1959-60. That is, whereas there was an increase in acreage of 1,14,000 acres or 1.6 per cent in area, the yield increased by 3,33,000 tons or by 31.8%. The increase is shown primarily by U. P. and Punjab. The area in West Bengal went down.

The official estimates of Cotton for 1960-61 puts the current year's area at 1,89,71,000 acres and production at 53,94,000 bales of 392 lbs each. This compares very favourably with the partially revised estimates for 1959-60 when the area was 1,88,04,000 acres and production 36,78,000 bales. There has, therefore, been an increase of 1,67,000 acres or 0.9% in area and 17,16,000 bales or 46.7% in production.

The following are the figures of production of rice and wheat :

Crop Year	Rice (In 000 tons)	Wheat
1956-57	28,578	9,254
1957-58	24,885	7,741
1958-59	30,354	9,772
1959-60 (Partially Revised Estimates.)	30,963	10,089
1960-61 (Final Estimates)	33,700	10,648

Actually the latest estimates may even give us still higher production for the year 1960-61 and there is every likelihood of our reaching nearabout the target set for the Second Plan.

I.C.A.R. schemes

The Annual General meeting of the I.C.A.R. was held on the 30th and 31st August, 1961. The Governing Body has allotted Rs. 25 lakhs for pilot projects to test the results of researches conducted, under the Council's auspices, on a commercial scale. It also decided in principle that the I.C.A.R. should grant financial assistance for cooperative research to industries in the agricultural, animal husbandry and allied fields. The distribution of more than 7000 pounds of seed of 4 new maize hybrids is expected to result in substantial increases in production, ranging from 20 to 40%. The additional area brought under orchards in the Second Five-Year Plan is estimated that 1,65,000 acres which should yield about 3.3 lakh tons of additional protective foodstuffs in the next five to ten years.

Three new strains of cotton have been released to cultivators in U. P., Madhya Pradesh, Andhra Pradesh and Mysore. Besides, nearly 5 lakh pounds of Andrews (Sea Island) cotton seed produced in Kerala and Mysore is expected to cover a new area of 14,500 acres in the two States. Altogether the I. C. A. R. sanctioned 105 new schemes of research in the fields of Agriculture, animal husbandry and allied subjects at a total cost of Rs. 38.47 lakhs. Continuance of 99 current schemes was also sanctioned at a cost of Rs. 51.61 lakhs.

A new school of Animal Husbandry

It has been reported that the State Government of Bihar in the Department of Agriculture have decided to open a new Animal Husbandry School during the Third Five-Year addition to the two they already have. The new school will admit 160 trainees. The total estimated cost of the scheme is Rs. 10,90,220.

Laudable efforts of the Mysore Y. F. A.

The Mysore State Young Farmers' Association has been ahead of most of the other State organisa-

tions in India. It has not only established a large number of well-planned and efficiently working clubs but they are all affiliated to the State Young Farmers' Association there. In their meeting on the 16th August, 1961, the Mysore State Young Farmers' Rally Committee, which met under the Chairmanship of Shri H. S. Linga Reddy, Deputy Minister for Planning and Development and Chairman of the Mysore State Young Farmers' Association, has decided to hold the Young Farmers' Rallies throughout the Mysore State from the 2nd October 1961 to 27th December, 1961. They have chalked out an elaborate scheme. The start will be made with the Taluk rallies followed by District rallies. The State Rally will be the natural culmination of the youths. The Young Farmers' Association of India has promised to provide financial assistance at the rate of Rs. 25/- for the Taluk Rally and Rs. 50/- for the District Rally. The main objectives behind the rallies are stated to be as follows :—

- (1) To suitably recognise the best achievements of Clubs and individual members.
- (2) To provide to the rural youth clubs adequate opportunity and encouragement to display their achievements.
- (3) To focus the attention of all concerned on the problems and needs of rural youth.

Taluk rallies will be held from the 2nd October, 1961 to 15th October, 1961; the district rallies from 1st November to 15th November and the State Rally from 25th to 27th December, 1961. The Association has decided to invite the Prime Minister, Mrs. Indira Gandhi, Shri S. K. Patil, Shri Sanjiva Reddy and others. The activities of the young farmers are coordinated with the Farmers' Forum, and I hope, therefore that all members of the Bharat Krishak Samaj will give their wholehearted support and cooperation to this fine endeavour on the part of the Mysore Association.

The effect of deep ploughing

Dr. Kishan Singh Bedi, Joint Director of Agriculture, Research and Education of Punjab has done a great service in bringing out a very nice booklet on the adoption of deep ploughing for obtaining better yields. I have often alluded to the imperfect tillage of our lands and I was impressed by the results claimed by the Chinese people. I had recommended that we might experiment with deep digging and ploughing. As you are probably aware, we had some trials in three dozen places with regard to deep ploughing. Of course, we did this on the Chinese model, which has proved to be uneconomical. But although this experiment has, from certain points of view, failed, there is no doubt whatever, that for the removal of weeds, to afford better aeration and, therefore, better nutrition to plants, ploughing between 6" to 8" at least is extremely important. Dr. Bedi has given this subject a scientific treatment and the Punjab Government has decided to take up this campaign very seriously.

I have asked Dr. Bedi to supply me copies of his brochure both in English and Hindi for such of our

members as would like to have. If they write to Dr. Bedi directly, I am sure, he will be glad to send the copy in either of the two languages. He is also preparing a small article in Hindi so that it may have wider publicity. The recommendations contained in the brochure are based on the research conducted by Dr. Bedi for over a decade under the conditions obtaining in the State of Punjab. One of the conclusions is that the effect of deep ploughing is not confined to one crop but lasts for a number of years. Deep ploughing again has to be done only once in 3 or 4 years. Such deep ploughing is not restricted only to tractors. It can be done even with bullocks but of course the bullocks have either to be powerful or larger in number.

The importance of sub-soiling

My father knew every bit of this scientific conclusions and I have known them from him over 50 years ago. In fact, it is known, I believe, to every good farmer. The difficulty is that for various reasons every farmer is not able to do it and then the vicious circle starts. Want of sufficient turning of the soil makes it infertile and, therefore, results in poorer crops. The poor crops incapacitate the farmers from the better investments and so on. Dr. Bedi has also pointed out that the mineral resources lying in the sub-soil layers remain locked up in an unavailable form. Sub-soiling renders them available for use by the plants and thus reduce the need for the application of artificial fertilisers. According to him, the grain yield from the gram crop immediately following the operation showed 681.5 per cent increase over that obtained from the control (not loosened) plots. In the fourth year following this treatment, the increase in the grain-yield was still as high as 329 per cent.

Another important factor that came to light during the research was that digging of the sub-soil was effective in reducing appreciably the incidence of disease of wheat and capable of increasing the yield of the wheat crop by 33 per cent. Dr. Bedi says that there is every likelihood of exploiting the operation of deep tillage in controlling still many more diseases and enhancing the yield of many more crops. One other commonsense advantage is that weeds that grow can be removed far more easily than from hard soils.

The Central Warehouses

The number of the Central Warehouses is reported to have risen from 27 to 40 during the year 1960-61 thus fulfilling the Second Plan target. The State Warehouses increased from 148 to 266. The storage capacity of Central Warehouses rose from 14,040 tons at the end of 1959-60 to 79,020 tons at the end of 1960-61. The revenue collected increased from Rs. 3,81,000 to 7.87 lakhs. The outstanding advances made on the basis of warehouse receipts stood at Rs. 5 crores as against Rs. 2.86 crores at the end of the previous year.

The new pattern of education

The Agricultural University at Pant Nagar in U.P. has adopted the course system, grading and

internal examination system and other academic features followed by the Land Grant Colleges of America. Like those Colleges in U.S.A., the University has a common integrated system of teaching and administration. The University has so far established the following units :

1. College of Agriculture
2. College of Veterinary Medicine
3. School of Basic Sciences and Humanities.

A college of Agricultural Engineering and Technology with an annual admission capacity of 75 students is due to commence in July, 1962. The State Government also intends to establish a College of Home Science towards the end of the Third 5-Year Plan. The annual admission capacity of the College of Agriculture and Veterinary Medicine is 150 and 100 students per year respectively.

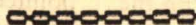
The University runs a compulsory work programme in which each student is expected to work for three to four hours a week. They are paid at local rates which are Rs. 1.50 per working day of

8 hours. Besides, there is a Voluntary Work-Programme in which some students are offered monthly employment at about Rs. 15/- per mensem for doing certain specific tasks. Students also do voluntary work on the farm, Hybrid Maize Research Centre and in the University on hourly wages fixed in accordance with the importance of work. Students work in the Telephone Exchange, laboratories and in offices. During vacations, a few students are given employment in accordance with their capacity in various schemes run by the University.

Some new institutions which are likely to be set up in the course of the Third 5-Year Plan by the Ministry of Food and Agriculture, the following may deserve mention :

A Central Sheep and Wool Research Institute ; a Grass Lands Institute ; two Tobacco Research Stations ; and a number of seed testing laboratories.

Panjabrao Deshmukh
President
Bharat Krishak Samaj



The Conference of State Ministers of Agriculture

State Ministers of Agriculture, who met in Delhi on the 29th and 30th August, 1961, urged that the current rising trends in agricultural production should not be allowed to result in uneconomic prices for cultivators. They stressed the necessity of a price policy which would prevent such a situation from arising. The Ministers met unofficially in New Delhi under the Chairmanship of Dr. Panjabrao Deshmukh, Union Minister of Agriculture.

Dr. K. N. Katju, Chief Minister, Madhya Pradesh pressed that procedures for raising production must be coupled with a sound price and marketing policy. He wanted that encouragement be given to the formation of cooperative marketing societies.

The Agriculture Minister of Bihar said that the problem today was not one of high agricultural prices but what would happen if there were "a crash in prices" resulting from high production. The Madras Minister,

Shri Bhaktavatsalam was among others who supported this view.

The Assam Minister pleaded the case of jute cultivators. He wanted the adoption of a price support policy in jute.

Shri Shriman Narayan, Member of the Planning Commission, in reply to these comments, said that the Third Plan definitely laid down that the cultivator must obtain a reasonable return for his produce.

The setting up of cooperative marketing societies was of the highest importance in order to avoid economic exploitation of the producer. The Plan stated that in 2500 grain mandies there should be properly run marketing societies.

Referring to other aspects of agricultural development, Shri Shriman Narayan pointed out that the Third Plan gave the highest priority to agriculture. The success of the Plan mainly depended on the

capacity to increase agricultural production "otherwise we shall not be able to achieve the degree of economic growth envisaged." While the funds allotted were adequate for the present, if as the Plan proceeded, more finances became necessary for the attainment of physical targets, particularly in regard to minor irrigation and soil conservation, these could be provided. He pointed out that agriculture depended not only on finance but there was also "an organisational and administrative side". The closest coordination was necessary among the various departments concerned. He stressed the importance of the Nalagarh Committee's recommendations in this connection.

Regarding Animal Husbandry development, Shri Shriman Narayan said that this subject must not be viewed in isolation. A rational approach was necessary fully to integrate agriculture, animal husbandry and dairy schemes.

With reference to minor irrigation, he said, there should be a common pattern of assistance so that the local people might know who much they had to contribute.

Atomic Energy in Agriculture

Begun in India only a few years ago, during the Second Plan period, research on the application of atomic energy in agriculture has already to its credit the production of better varieties of crop plants through the induction of mutations and the standardisation of improved fertiliser practices through radio-tracer studies. Control of pests and diseases and preservation of vegetables are other lines of work now being conducted at the Indian Agricultural Research Institute, New Delhi.

The informal Consultative Committee of the Ministry of Food & Agriculture was told that seeds and flowers of a wide range of crop plants were being treated with Gamma rays at the I. A. R. I's Gamma Garden with neutrons at the Apsara Reactor of the Atomic Energy Establishment, Trombay, and with radio-active isotopes such as radio phosphorus and radio sulphur. The facilities provided by the Gamma garden are being made use

of by various Central and State Agricultural Research Institutes.

From among the mutations already induced, a new wheat variety named NP-836 has been developed. This has well prominent awns (bristles found on the flowers), unlike the parent strain which is awnless. NP-836 is rust-resistant and suitable for cultivation in parts of Bihar and West Bengal. Indian farmers prefer awned varieties of wheat, since birds do not attack them so readily.

Several mutants with short and stiff straw have also been obtained in wheat through the application of atomic energy. Such varieties do not fall down under conditions of high soil fertility, enabling farmers to derive the maximum return from the fertiliser applied.

In tobacco, a mutation leading to increased leaf area has been obtained in the variety *Natu*; this mutant is now undergoing trials in the Guntur district of Andhra Pradesh, where it is extensively cultivated. Mutations of breeding interest

have been isolated in cotton, potatoes, tomatoes, maize, jowar and citrus. Seeds of teak and other forest trees have been irradiated and are now being studied at the Forest Research Institute, Dehra Dun.

Crosses between related species of plants never before successful can now be made by using pollen grains treated with radiation. A cross made in this way between two jute yielding species, *Corelorus olitorius* and *C. capsularis*, has paved the way for developing a new jute variety, possessing a white fibre, immunity to disease and pests and adaptability to a wide range of environmental conditions.

Through the use of insecticides and fungicides "labelled" with radioactive atoms, better methods of controlling pests and diseases are being worked out. The possibility of sterilising some important insects, such as the bed bug and the malarial mosquito, through the use of radiation is being investigated.

In regard to the preservation of vegetables, it has been found that treatment with suitable doses of Gamma rays prevents potatoes and onions from sprouting thus considerably extending their storage life.

(Continued from page 3)

For this purpose, at least one mechanic with the necessary tools should be provided in each district.

(9) Realizing the advantages of supplying pesticides in small packings, the seminar suggests that the formulators of pesticides should market their products, as far as possible in convenient small packings.

(10) Weeds, specially in wheat and *bajra* crops, are very important in Rajasthan. Efforts should be made to control the weeds over large areas.

(11) Plant protection equipment such as sprayers, dusters, seeds treating machines and rat fumigation pumps fall under the same category as other agricultural implements and machinery. Therefore, they should also be eligible for the same concessions in respect of railway freight and exemption from sales-tax as the other agricultural implements.

(12) Panchayats, Panchayat Samitis and Zila Parishads should play a very vital role in furthering plant protection activities in their respective areas. They should assist in the prompt reportings of pest and disease out-breaks and also mobilizing the locally available resources for taking up control operations.

(13) The Cooperative and Marketing Societies should stock pesticides and plant protection machines in sufficient quantities and numbers at suitable places in rural areas within easy reach of the farmers. They should employ only such personnel who have been trained in the proper handling and storing of pesticides and equipment. These societies may make suitable credit arrangements with the Governments, Reserve Bank and firms dealing in pesticides and plant protection equipment.

(14) Private agencies should be encouraged to function in collaboration with Government agencies in

plant protection work. This matter, however, may be examined in the light of conditions existing in the State and the nature of the facilities the private firm/firms are in a position to provide.

(15) Adequate and regular training facilities should provide both for officials and non-officials of different categories engaged in, or connected with, plant protection work at the State, Divisional, District, and Block levels.

(16) Non-agricultural Graduates appointed for plant protection work should receive intensive training in plant protection before being entrusted with field work.

(17) The Apex Marketing Federation should, as far as possible, make arrangements for stocking various kinds of common pesticides and plant protection equipment and should not restrict its stocks to the products of particular firms only.

Aphids and Jassids on Ragi Control Measures

If you are a ragi grower, you are familiar with the aphids and jassids that commonly attack the crop.

You can easily notice aphids by the presence of ants near the base of the plants. These live with the aphids. On pulling out the affected plants, you can see a number of shiny aphids sticking to the roots. Jassids, on the other hand, are the insects you find hopping about on the leaves.

To control aphids, dust ten per cent BHC on the soil all around the affected plants. Mix the chemical well with the soil by stirring. You need about 20 to 25 pounds of BHC ten per cent dust for treating an acre.

You can also use crude oil emulsion mixed with irrigation water instead. For controlling jassids, dust DDT five or ten per cent at 20 pounds per acre.

SUPPLYING NITROGEN TO SUGARCANE

Increased Yields Obtained

Countrywide field trials during the last five years prove that with proper manures and fertilizers, sugarcane yields can be easily raised by farmers.

In 1958-59, these field trials gave 22.9 (Madras) to 31.8 per cent (Bihar) additional sugarcane yields per acre, with proper manuring of the crop.

Nitrogen is the most important plant food sugarcane needs. The dose of nitrogen recommended is 120 to 150 pounds in North India and 250 to 350 pounds or more for peninsular India. The nitrogen is to be given both in the organic form (such as a green manure, cattle manure or compost or molasses) and the inorganic form such as ammonium sulphate nitrate.

The ratio of organic to inorganic manure considered good for North India is 1:1, while it is 2:1 for the south.

Chemical fertilizers can be applied singly or with organic

manures like cattle manure, at the time of preparing the land for planting, at planting or at the tilling and earthing up stage.

Most nitrogenous fertilizers can be applied broadcast, or drilled or given in irrigation water.

THE THIRSTY PALM

Watering the Coconut

For the coconut to grow well and yield well, the grower has to provide for water during periods of drought.

But several growers take to flood irrigation of the entire garden during the summer months, as in parts of Andhra Pradesh and Mysore.

The system is costly and wasteful. It is best to dig basins round each palm and lead water into them through channels. Water thus supplied is quite sufficient for the palm.

Where the number of palms is small and the grower and his family members can spare the time, pot-watering with the *picotah* will be quite economical.

Where the grower can afford, and the garden is in a sandy area, he can set up a filter point. A three-inch or four-inch filter point can look after the water needs of ten acres of the garden.

In the coastal sandy areas, sea water can easily be used for irrigating the coconut. The sea water should not be, however, used in heavy soils.

TRAMPLING MADE EASY

Implement That Helps

With as little as Rs. 35/- you can solve your problem of burying green manure in your paddy fields, especially where you are unable to get the labour needed for it.

With this money, you can buy a green manure trampler. There are two types available in the market for you to buy.

The trampers were developed in Madras State, and are popular with the farmers there.

Weighting only 77 pounds, the trampler is simple in its parts. It has ten-inch Diameter, steel discs with cast iron hubs mounted at a horizontal pipe shaft and has horizontal blades around the shaft.

You can work the trampler with a pair of bullocks when you spread the green manure over the field and work the trampler, its blades press the green material into the puddle two to three inches deep.

You can cover about three acres a day easily with the implement. And it will cost you only half of what you want to spend on labour to work the implement.

The Agricultural Engineer of your State would be able to order this implement for you.

SORGHUM EARHEAD BUG

BHC 10% gives a satisfactory control

Keep 10% BHC ready at hand when your summer sorghum crop is in flower. It is at this time you have to expect the earhead bug to visit your crop. This bug will suck away the juice from all the grains.

You can control it easily and cheaply with 10% BHC. To dust an acre you will require 25 pounds of 10% BHC. A duster will make your job easy. If you do not have a duster, use a thin cloth bag. Tie the bag with the powder in it to one end of a stick and dust on top of the ear.

WHIP SMUT DISEASE OF SUGARCANE

Prompt Control Necessary

If you see stunted sugarcane plants which develop whip-like tops, it is whip smut disease.

The whip will have a silvery covering in the early stage, which breaks open later, exposing a black powdery material. These are the germs (spores) which can infect healthy canes and cause more damage to the sugarcane crop.

The best thing to do when you find the whip smut disease is to pull out immediately all affected sugarcane clumps and burn them. Also, discontinue raising a ratoon from such a diseased crop.

For your next sugarcane crop, use setts taken from a disease-free crop. Better still, use setts from any of the following whip-smut resistant varieties:

Co. 527, Co. 285, Co. 385, Co. 449 and Co. 370.