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Legacies of Gandhi

Shrimati Indira Gandhi

Prime Minister of India

Each person's understanding of Gandhiji is a measure of his own change and growth. While Gandhiji was alive, many of my age-group found it difficult to understand him. Some of us were impatient with what we considered to be his fads, and we found some of his formulations obscure. We took his Mahatma-hood for granted, but quarrelled with him for bringing mysticism into politics.

This applied not only to my generation. In his Autobiography, my father describes the difficuly which he and others of his generation felt in integrating Gandhian ideas into their own thought structure. But little by little, the experience of the ebb and flow of our national movement enabled my father to arrive at a fuller understanding of Gandhiji and to essential elements of Gandhiji's thinking into his own. He called him a "magician" and devotedly attempted to translate Gandhian thought into contemporary terms. to make it more comprehensible and to extend its influence to young people and intellectuals.

Gandhiji himself did not demand unquestioning obedience. He did not want acceptance of his ends and means without a full examination. He encourged discussion. How many times have I not argued with him even when a mere girl ? He regarded no honest opinion as trivial and always found time for those who dissented from him—a quality rare in teachers in our country or in prophets anywhere. He was an untypical prophet also in that he did not lay claim to revelation. He held forth neither blandishment of reward nor fear of punishment. Nor was he weighed dawn by the burden of his mission. He was a saint who quipped and had use for laughter.

The centenary year of Gandhijis birth also markes the fiftieth anniversary of the Jallianwala Bagh tragedy. Those who confuse rigidity or harshness with strength would do well to ponder over the effect of this so-called strong-handed action on the future of the British Empire. Seldom has a single event so moved an entire nation, shocked it into a reappraisal of values and aims. It made powerful impact on men like Motilal Nehru and the poet Rabindra Nath Tagore. Tagore gave up his kinghthood and wrote passionately and understandingly on the problems of colonialism. My grandfather was drawn, along with the entire family, into Gandhiji's circle. Our lives changed. It was the year which brought Gandhiji to the helm of our political movement. Looking back on this half century, we are better able to realize the full impact of his personality and of his teaching, though a total assessment is still in a state of transition. Not for decades will we be able to wholly measure the extent of his work for India and for all mankind. Even so, one cannot but marvel at the turn Gandhiji gave to our history in that one year. It was as though with his two thin hands he lifted up a whole people. What changes he brought about in the personel lives of such a vast number of people, eminent and humble alike ! To be prime mover of politics is not a greater achivement than to influence so profoundly the inner lives of people.

Gandhiji differs from his forerunners on the national scene in that he rejected the politics of the elite and found the key to mass action. He was a leader, closely in tune with the mass mind, interpreting it and at the same time moulding it. He was the crest of the wave but they, the people, were the wave itself.

Gandhiji freed us from fear. The political liberation of the country was not the culmination but a mere by-product of this liberation of the spirit. Even more far-reaching was the alteration he brought about in the social climate of India. Gandhiji set us free also from the walls and fetters of our social tradition. It was the axiomatic assumption of the equality of women and men, of the supposedly low-born and high-born, the urban and the rural, that inducted the masses into the Gandhian movement. In the long history of India, every reformer has fought against the hierarchy of caste and the debasement of women but no one succeeded in breaking down discrimination to the extent that Gandhiji did. The women of India owe him a special debt of gratitude. And so do all other groups who suffered from age-old handicaps.

Mahatma Gandhi once wrote :

Let no one say that he is a follower of Gandhi. It is enough that I should be my own follower. I know what an inadequate follower I am of myself, for I cannot live up to the conviction I stand for.

The Gandhians would have us believe that Gandhiji evolved a universal philosophy, analysing everything, reconciling everything and prescribing for every contingency. How unfair this would be to a man who never assumed omniscience and never stopped his experiments with truth and understanding. He was an integrated being but he did not deal in absolutes. Few men were greater idealists than he, but few more practical. He propounded fundamental truths, but in every plan of action that he drew up, he proceeded on the basis of "one step enough for me".

The policy of planned industrial development which we have adopted in the last two decades has sometimes been criticized as a calculated abandonment of Gandhism. Those who level this charge and advocate cottage industries do not themselves refrain from using the products of large industry such as aircraft. automobilies and telephones. Gandhiji

did not shun the railways, and he was a punctilious user of watches. And if we use railways and watches, does it make sense not to manufacture them ourselves ?

Gandhiji's advocacy of cottage industries should, therefore, be understood in the correct context. He was intensely concerned with poverty. He abhorred waste. He wanted to use the latent energies of the vast army of rural unemployed to produce more goods for the nation and some wealth for themselevs.

Then again, like other sensitive men before him, he was reacting to the brutal effects of the first phase of industrialisation. As a seer concerned with the ultimate condition of man, he wanted to caution us against becoming prisoners of our own devices. In his copious writings on the place of machine, there are many passages which show that Gandhiji's outlook was broader and more humanely practical than some literalist interpreters would have us believe.

To me, Gandhiji is not a collection of dry thoughts and dicta but a living man who reminds one of the highest level to which a human being can evolve. Containing the best from the past, he lived in the present, yet for the future. Hence the timelessness of his highest thoughts Much that he said and wrote was for the solution of immediate problems ; some was for the inner guidance of individuals. His intellect did not feed on derived information. He fashioned his ideas as tools in the course of his experiments in the laboratory of his own life.

Speaking of Gandhiji's work in South Africa, Gopal Krishan Gokhale said that he made heroes out of clay. Sometimes I wonder whether we have not become clay again. The exaltation which a truly great teacher produces in his time cannot last very long. But the teaching and thought of such people have a reach farther than their own time and country. We who were born in Gandhiji's own time and country have a special obligation to cherish his image. More than his life was his message.

It is not despite but through his time and place that a man achieves true universality. Gandhiji identified himself totality with the common people of India. For this he even changed his mode of dress. Yet he was receptive to the best thought from other parts of the world. The impact on him of his days in England and South Africa as a student and practitioner of law was evident in his insistence on sanitation and his habit of examining all that he heard by strictly applying the evidence act. But he assimilated everything he adopted and evolved Indian solutions to Indian problems.

Another of his glorious legacies is the secularism for which he gave his life. Secularism means neither irreligion nor indifference to religion, but equal respect for all religions—not mere tolerance, but positive respect. Secularism demands constant self-examination and unceasing exertion. The great truth is inscribed on rocks by Asoka, that no man reverences his own religion unless he reverences others' religion also. India has been great and has risen high in those periods when this truth was acknowledged and practised by her rulers. In our times Gandhiji and Jawaharlal Nehru made it a living reality for us. Without it there is no future for our nation.

I hesitate to speak of the other great teaching left us by Gandhiji's non-violence. I hesitate not because I find any justification for violence. Mankind has accumulated such a fearful store of weapons of destruction that I sometimes wonder whether we have any right to hope. Wars still erupt here and there but even more distressing and alarming is the growth in all parts of the world of hatred in thought and violence in action, and the reckless recourse to the agitiational approach. Gandhiji said: "In the midst of darkness, light persists." We must have faith. The ultimate justification of Gandhiji is that he showed how armed strength could be matched without arms. If this could happen once, can it not happen again ?

Life means struggle, and the higher you aim, the more you wish to achieve, the greater is the work and sacrifice demanded of you. Men of all religions have evoked the eternal truths. It is the great good fortune of India that she has given birth to great sons who have again and again revitalized her ancient thought to make it a part of the lives of the people. In our own lives, we were guided through perilous times by Mahatma Gandhi and Jawaharlal Nehru who merged themselves in the general good. Each complemented the other. Each taught that every decision should be put to the acid test of its relevance to the welfare of the multitude. More than any "ism", this guiding principle will save us from error. As Jawahar Lal Nehru said:

"The greatest prayer that we can offer is to take a pledge to dedicate ourselves to the truth, and to the cause for which this great countryman of ours lived and for which he has died."

VOICE OF BAPU

Democracy must in essence mean the art and science of mobilizing the entire physical, economic and spiritual resources of all the various sections of the people in the service of the common good of all.

In true democracy every man and woman is taught to think for himself or herself. How this real revolution can be brought about I do not know except that every reform, like charity, must begin at home.

The very essence of democracy is that every person represents all the varied interests which compose the nation. It is true that it does not exclude and should not exclude special representation of special interests, but such representation is not its test. It is a sign of its imperfection.

Possession of power makes men blind and deaf, they cannot see things which are under their very nose and cannot hear things which invade their ears. There is thus no knowing what power-intoxicated government may not do.

Scientific Method of Wheat Cultivation

By R. C. PANDE

Lecturer in Agronomy, T.N.K.V.V Agri. College, Rewa, (M.P.)

Next to paddy, wheat as a food crop is cultivated all over the world. The major wheat growing countries are USSR, U.S.A., India, Canada covering an area of 6,46,00,000 ha, 1,82,95,400 ha, 1,36,57,000 ha, and 21,55,000, ha respectively. The average yields of U.K., West Germany, East Germany, France, U.A.R. and India are 3901 kg., 3501 kg., 3000 kg., 2606 kg, 2509 kg. and 702 kg. per hectare respectively. The low yields of wheat crop can be stepped up by following improved agronomic techniques. Such as the use of improved varieties, judicious manuring, proper irrigation and by proper control of insects pests and diseases. The fertilizer consumption per hectare of agricultural land in 1963-64 was 298.8 kg/ha in Belgium, 185.77 kg/ha in Netherland, 185.77 kg/ha in West Germany, 257.47 kg/ha in the world. This reveals that the consumption of fertilizers per hectare is very low in India and if the use of fertilizers is increased the average yields can be pushed upto a considerable extent.

Soil and Soil Prepation

The wheat growing area may be divided into two groups (i) The Indo-Gangetic alluvium of U.P., Bihar, Punjab, and some parts of Rajasthan, and (ii) the black soils of Malwa tract of Madhya Predesh, South, Rajasthan, Maharastra, Andhra Pradesh and Mysore. The loam and clayey loam soils are best suited for wheat cultivation. Four to five ploughings prefereably one ploughing with soil inverting plough should be done and each ploughing, if desired, be followed by planking in order to obtain a well pulverized and suitable seedbed. In black soils mostly *Bakhar's* are used for the preparation of seedbed.

Manures and Fertilizers Application

Manuring is an essential feature of wheat crop. Basal dressing of some organic manures like f.y.m. or compost @ 20 to 28 tons/ha or an equivalent quantity of oil cakes should be done 6 weeks before sowing the corp. If sufficient rain in received in August or September, the *pora* application of 15 to 25 kg/ha of N and P_2O_5 should be done at the time of sowing under irrigated conditions about 60 to 65 kg. N, 60 kg. P_2O_5 and 50 kg. K_20 per hectare may be applied *Desi* wheat and 120 kg. N, 80 kg. P_2O_5 and 60 kg. K_2O per hectare may be applied in Maxican wheat. Under high rainfall areas or in irrigated tracts green manuring crops like *Guar, Dhaicha, Cowpea* and sunhemp may be grown and burried in the soil after one and half months of sowing. In addition to this Superphosphate may directly be applied to the wheat @ 400 to 500 kg/ha. There should be about two months interval between the burying of green manure crop and sowing of wheat crop. Singh (1965-Thesis M. Sc. (Ag.) University of Saugar) from Rewa (M.P.) recommended a dose of 44.8 kg. each of N and P_2O_5 per hectare, for *Bunds* areas of Madhya Pradesh. Chaurasia (1966—Thesis of M. Sc. (Ag.) J.N.K.V.V. Jabalpur) found that the application of 44.8 kg. N and 22.2 kg/ha of P_2O_5 gave 20 q./ha of grain and 41.7 q/ha of *Bhusa* under unirrigated condition. Application of 44.8/ha N alone gave 8.8 q/ha grain, 40.7 q/ha *Bhusa* and the net profit was found to be Rs. 640.60/ha. Chauhan (1966—Thesis M.Sc. (Ag.) J.N.K.V.V. Jabalpur) stated that the application of 67.2 kg/ha NPK each without irrigation gave 25.04 q/ha grain, 51.64 q/ha *Bhusa* and the net profit was Rs. 971-05/ha. These results reveal that even without irrigation the use of fertiliers gives a good profit. He furthers stated that three irrigations along with 67 2 kg/ha NPK each gave 33.22 grain and 65.22q/ha *Bhusa* and the net profit was Rs. 1595.33/ha. Swaminathan, Kohli and Anderson (1966-Indian Farming 16(3) recommended 88,92 to 113.62 kg.N/ha (36 to 46 kg.N/acre 44.46 kg. P_2O_5/ha (18 kg P_2O_5/acre) and 61.75 kg/ha of muriate of potash (25 kg/acre) for Sonora 64. The recommendations made by the wheat agronomists workshop June 14-16, IARI, New Delhi (1967—Indian Farming 17(5) were to apply 100-120 kg. N/ha for dwarf wheat to obtain maximum economic returns, but when wheat follows green manure or follow this dose may be reduced to about 80 kg. N/ha and about 50 to 60 kg/ha of P_2O5 (if the soil test information is not available) and 40 kg. K_2O/ha if the soil is suspected to be deficient in potash. Bhardwaj and wright (1967—Indian Farming 17 (5) : 36) stated that a dwarf wheat crop yielding 50q/ha removes roughly 180 kg. N, 75 kg. P_2O_5 and 140 kg K_2O per hectare and recommended that 100 to 120 kg. N/ha will give near maximum with dwarf wheat under many field conditions but when the wheat crop is followed by green manuring or follow the nitrogen rate could be reduced to approximately 60-80 kg. N/ha. Phosphorus and Potash should also be applied on the basis of soil tests and the *later* should be applied less frequently than nitrogen and phosphorus. If soil test is not available, apply 50-60 kg. P_2O_5/ha and they have further stated that potasium often is not needed for wheat crop but if the soil is known to be deficient apply 50 to 60 kg. K_2O per hectare. The following manurial schedule may be drawn from the above discussion.

(i) Under rainfed conditions in up land areas 5 to 8 tons/ha of f.y.m. or compost along with 20 kg. NPK each should be used.

(ii) Under rainfied conditions in mid land specially in low

lying areas 8 to tons/ha of f.y.m. or compost along with 20-25 kg/ha N, 20 kg/ha of P_2O_5 and 15 to 20 kg/ha of potash should be applied.

(iii) In *Bunds* areas of M.P. where the rainy season water is retained from July to September and then drained out in October for wheat sowing, about 12-15 tons/ha of f.y.m. or compost if available along with 25-40 kg/ha of N, P_2O_5 and K_2O each should be applied. In black soils of *Bunds* areas 40 kg/ha of nitrogen and phosphorus each should be applied and in potash dificient soils application of 25 to 30 kg/ha of potash may be used.

(iv) Under irrigated conditions about 15 to 20 tons/ha of f.y.m. or compost along with 50 to 60 kg/ha each of nitrogen and phosphorus should be applied. In potash deficient soils 30-40 kg/ha of potash will be useful for higher yields.

(v) For mexican wheat about 25 to 30 tons/ha of f.y.m. or compost and 100-120 kg. N, 50 to 60 kg. P_2O_5 and 40 to 50 kg. K_2O per hectare should be applied.

Time and Methods of Manures and Fertilizers Application

Organic manures like f.y.m. or compost should be applied six weeks before sowing. Among fertilizers, phosphatic fertilizers should be applied before sowing with a help of fertilizer cum seed drill at the time of sowing. Under unirrigated conditions nitrogenous fertilizers should be applied just before sowing when the last ploughing of the fields is done and then the broadcasting of the nitrogenous fertilizers should be done followed by planking so that the fertilizer is mixed and moisture is conserved. Under irrigated condition the application of phosphatic and potassic fertilizers is to be done in the same way as in the unirrigated areas and the nitrogenous fertilizers should be splitted up into two or three doses. In places where the nitrogenous fertilizers are divided into two doses, the half is to be applied before sowing or at the time of sowing by broadcasting and the rest half should be applied at the time of first irrigation or 40 to 45 days of sowing but when the *doses* are splitted up into three, one third or half is applied before sowing or at the time of sowing and the rest half is divided into two and the second dose should be given at the time of first irrigation and the third dose should be given at the time of second irrigation just before flowering in *Desi* wheat. Swaminathan, Kohli and Anderson (1966-Indian Farming 16(3) stated that in Sonora 64 seventyfive percent of the nitrogen and entire quantity of phosphorus and potassium should be applied prior to sowing.

The remaining twentyfive percent of Nitrogen can be given at the time of second irrigation. The recommendations made by the wheat Agronomist workshop June 14-16 IARI New Delhi (1967-Indian Farming 17(4): (27) were that applying one half of nitrogen at sowing, mixed with the soil and the remaining one half as a top dressing just prior to first irrigation. All the phosphorus and potassium should be applied before sowing by drilling, and if drilling is not possible P_2O_5 and K_2O should be broadcast and mixed with the soil. Bhardwaj and Wright (1967—Indian Farming 17 (5) stated that all the phosphorus and potassium with two thirds of the nitrogen mixed with the soil by harrowing or piror ploughing to planting. The remaining one third of the nitrogen can be applied as a top dressing just prior to first irrigation.

Varieties:

Punjab—C518, C591, C281, NP718, NP830

Delhi—NP718, N.P.823, NP824

Gujrat—N.P.710, N.P.718, Arnej 206.

Maharastra—N.P.710, N.P.718, Niphad 4; Jay Vijay

Himachal Pradesh—N,P.809 N.P. 829.

Rajasthan—N.P.718, R.S. 31-1, R.S. 9-11

Madhya Pradesh—N.P.718, N.P. 839, Hybrid 11 and Hybrid 65, C591.

Uttar Pradesh—N.P.710, N.P. 809, N.P.830, C591

Bihar—N.P.710, N.P. 758.

Orissa—N.P. 710, N.P. 718.

West Bengal—N.P.710, N.P.770 N.P. 809.

Recently dwarf varieties of wheat have become very popular throughout the country and Sonora 63, Sonora 64, Lerma Rojo, S. 227, Kalyan 207 S. 308, and Sharbati Sonora are important varieties.

Crop Rotations and Mixtures :

(1) Sanai—wheat—juar+Arhar +Kodo+Til+Moong+Ambari.

(2) Cotton — wheat — Hybrid Maize—Wheat+Mustard.

(3) Paddy—wheat+linseed.

(4) Paddy—wheat+gram.

(5) Paddy (Fujisaka 5)—Paddy (Taichung Native 1)—wheat

(6) Moong (Pusa Baisakhi)—Maize (Ganga 3) —Toria (Punjab selection 1) —wheat (Sharbati Sonora)

(7) Moong (Pusa Baisakhi)—Maize (Ganga 3)—Potato (Kufari Chamatkar (O.N. 1202)—wheat (sharbati Sonora).

Under unirrigated mixed cropping is practiced in various places, so as to make at least one crop successful. Kanwar and Dhillon (1967—Indian Farming 7 (2) stated about the rotation No. 5 cited above that the combination of two dwarf varieties of rice (*Fujisaka-5* and Taichung Native 1) produced 14107 kg/ha of paddy grown in 188 days (the first and the Second crop) and after harvesting the second crop of paddy Mexican wheat is sown and even if 6000 kg/ha yield is obtained, it should be possible to obtain 20 tons/ha of grain in a year. Bains, Chowdhry and Daya Nand (1968—Indian Farming 18(4) reported a net income of Rs. 3221.25 and Rs. 4143.96/ha respeetively from the rotation No. 6th Moong—Maize—toria—wheat) and 7th (Moong—maize—potato—wheat) in one year.

Seed And Sowing

Good quality seed should be sown for obtaining good yields. A

(*Contd. on page* 13)

New Techniques in Farming

Agronomists in the United States have a goal which if achieved, could increase the world's food supply by at least 50 per cent.

Their goal : To assure that every seed planted gets an optimum environment with a minimum of Stress so that an entire crop may attain simultaneous uniformity of size, spacing quality and harvest maturity.

It is a goal that agronomists are confident will be reached before long. Their optimum is based on progress already made in obtaining 90 per cent or higher emergence of some seed varieties.

"The world could produce 50 per cent more food if every seed of every crop planted on all continents would produce its full potential at harvest maturity," one agronomist said.

Scientists are joining hands with agricultural engineers in efforts to develop techniques that will :

1. Stimulate seeds to germinate at temperatures significantly lower or higher than normal.

2. Place and space each seed precisely for maximum use of sunlight and moisture.

3. Envelop each seed in a kind of "miniature nursery" within which the seed is protected against disease, insects, rot, weeds, overcrowding and soil crusting.

By capitalising on these advantages growers could benefit from faster, low-cost mechanical harvesting, especially on crops traditionally reliant on manual labour.

"Miniature nursery"

Seed coverings—someone has likened them to "miniature nurseries"—seem to be the answer agronomists are seeking.

Some experiments involve coating each seed with a ball-like compound, giving it a uniformity in shape and size to permit use of precision planters in the field. In each ball, along with the seed, would be elements to fertilise it and protect it chemically against insects and disease.

Numerous materials have been used to modify the seedbed. Plastic film and pertroleum mulches have been employed to raise soil temperature and hasten germination of early planted crops.

Anti-crusting materials have been tested extensively as substitutes for soil to cover lettuce seeds. All of those materials generally promote the emergence of seedings by reducing or eliminating crusting over the seed.

The use of preformed vermiculite cones and discs to encase lettuce seeds have been reported by A. W. Pauli, agronomist, and B.L. Harriott, agricultural engineer, both of Deere & Company, of Moline. Illinois.

With this technique, they said, lettuce seeds were encased in a geometrically-shaped matrix of compressed vermiculite and polyvinyl acetate. The shaped cone or disc with the imbedded seed is passed into the seedbed, leaving the top exposed.

Before seed is used, it is treated with a nutrient solution to stimulate germination.

Though this vermiculite "mini-nursery" technique has been successful for commercial lettuce growing research indicates similar results are possible with seeds of corn, cotton sugar beets and grain sorghum.

"Seeds on a spindle"

"Seeds on a spindle" is another method beginning to achieve popularity with commercial growers of vegetables in the United States, and in some other countries. It is precision planting at its best, according to those experienced with this new planting technique.

John G. Knoop, writing in the U. S. *Farm Quarterly* magazine, supplied a terse description of the technique :

"The tape runs out in bright ribbons of polyester from reels on a planting sled. The tape unrolls under the soil at the prescribed depth, each seed spaced with the precision of a computer programme and each seed oriented horizontal to the soil surface. When the planter reaches the end of the field the tape has dissolved (as a result of water sprinkling) without leaving a trace. The seed is locked in place, ready to germinate.

A few years ago Union Carbide Company, a world-famous producer of chemicals and plastics, discovered a polyethylene oxide (trademarked Radel) which is very stable under normal temperatures but really dissolve in 60 to 90 seconds when put in the soil with adequate moisture for germination. Union Carbide calls its product EVENSEED tape.

The commercial producer of the seed tapes uses automatic machines which place the seeds, especially tested for high germination and emergence, properly spaced apart on the quarter-inch wide tape. Then the tape is sealed with an overlapping strip of tape and wound on spools.

The spools are used on planters, simply constructed units which can be bolted to any squre toolbar. The tape feeds through a tube to the furrow, laying the tape to the proper depth under the soil.

Synthetic soil blocks

Developed especially for the propagator and secondary grower are HR-8 synthetic soil blocks, described as a new and superior medium for rooting and shipping, planting cuttings or seedling.

HR-8 soil blocks, sterile, nontoxic to plant growth are made from carefully selected softwood kraft wood pulp and stabilised with acrylonitrile resin. The patented manutacturing process makes the woodpulp resistant to decay. The block is highly retentive of water capable of holding about 10 times its weight in water.

The blocks come with seed holes of three different sizes : small, medium and large. By selecting blocks with the proper size hole, the grower allows the seeds to make good contact with the block and encourages plant growth.

New Pesticides Needed to Control Pests

An international group of experts assembled in Rome by the Food and Agriculture Organization (FAO) agreed that the world faces a very definite danger of running out of pesticides capable of controlling many important agricultural pests. New kinds of pesticides are urgently needed.

The experts noted that sustained exposure to any pesticides almost invariably resulted in the appearance of resistance strains in pests.

"Cross-and multiple-resistance phenomena soon make them also resistant to many otherwise effective pesticides," delegates agreed in their final report. "Cattle ticks and cotton pests are already developing at a faster rate than new chemicals can safely be provided for use in many areas."

The participants—50 delegates from 26 countries, 11 observers from four international organizations and 13 FAO staff members—introduced 14 scientific papers which could lead towards a better understanding of the resistance phenomena. FAO has been working on pest resistance since 1963, when a Working Party of Experts was established.

Since modern pesticides were first extensively used for the control of insect carriers of human diseases some 25 years ago, the problem of resistance has assumed serious proportions to public health in certain areas. According to Dr. Rajendar Pal (India), a biologist for the World Health Organization (WHO), "resistance is the greatest single barrier to the completion of eradication programmes and to the maintenance of continuous control in the field of public health pests". Dr Pal added that in spite of much research, the only practical alternative at present is the use of new insecticides.

Delegates agreed that to Minimize the dangers of resistance, chemical treatment should ideally be confined to the target area, limited to the optimum timing, and should exclude unnecessarily persistent chemicals. Their use should always be integrated with all other suitable control methods in order to maintain pest population at levels below those of economic injury. (Non-chemical methods of control include cultural practices, the use of less susceptible varieties, biological and genetic control, hormoes, and the use of behavioural responses and of physical control measures).

Because the problem of pest resistance to pesticides was such a serious threat to the continuing and safe use of chemicals for crop and livestock protection, delegates recommended that FAO should expand its resistance programme and that research should be stepped up in collaboration with WHO, industry and other interested bodies.

World Fisheries Bank Recommended

Creation of a world fisheries bank to finance fishery industries, particularly in developing countries, was recommended at an international conference in FAO Headquarters, Rome.

The proposed bank should form part of an international fisheries development corporation to promote the industry's development throughout the world.

The corporation should be financed by Governments and treated as an international industry, utilizing a "total industrial approach". The corporation would collect and disseminate marketing and technological information and promote investment, particularly in less developed areas.

It would also consult with countries on investment problems, assist them in identifying and promoting investment opportunities, and provide "a forum where investor and promoter could meet."

GODOWN CONSTRUCTION AT RECORD SPEED

During the summer of this year the Central Warehousing Corporation built up a godown capacity of 45,000 tonnes in fourteen weeks as an emergency measure to handle the harvest of Rabi wheat.

The wheat production of 16.6 million tonnes in 1967-68 was an all-time record, the annual average for the preceding five-year period being only 11 million tonnes. The wheat production in Rabi 1969 is estimated to be even larger, though the final figures have not come in.

The Corporation was able to build up 45,000 tonne capacity in fourteen weeks. Warehouses each of 10,000 tonne capacity were put up at Abohar, Delhi, Karnal and Sriganganagar and a warehouse of 5,000 tonnes was erected at Chandausi. With innovation in designing, these godowns cost loss than Rs. 65 per tonne against the annual Rs. 160 per tonne or more for conventional godowns. There has been considerahle interest shown in this venture by the State Warehousing Corporations and other storage agencies and design of these transit godowns is being standardised.

Earlier, in the Rabi of 1968, exciting problems were met not only at the harvesting centres but at destination points also. The harvests of Punjab and Haryana had to be moved before the rains set in to the consuming centres and Calcutta was one of the more important destinations. In March 1968 the Corporation's storage capacity at Calcutta was only 20,000 tonnes and in the course of a few months the capacity went up to 2.72 lakh tonnes.

Current Problem Regarding Cereal

Virus Diseases In India

S. D. RAYCHAUDHURI
Head of the Division of Mycology & Plant Pathology

The cereal crops like wheat, Rice, Barley, Maize and Millets are known to suffer from a number of fungal and bacterial diseases. Of late however, some virus diseases have also gained prominence and due to the changing cropping pattern, these diseases are likely to pose a serious threat to our cereal crop production and therfore, it is extremely necessary to keep a close watch on them.

A term of Plant Virologists working in the Division of Mycology and Plant Pathology of this Institute as well as some others are busy conducting investigations on virus diseases of Cereal crops and they have already made useful contributions to the fundamental as well as applied research on these virsus diseases. Some of the findings are discussed.

Wheat

Mosaic streak virus: Mosaic streak virus disease which produces pale yellow streaks on leaves was reported from Malimpong in Darjeeling district and poses a a potential danger to wheat cultivation particularly in Hilly areas. This virus also infects large cardamom and ginger and is transmitted by aphids from diseased plants to healthy ones. The aphid vectors are Rhopalosiphum maidis, R. Padi, Brachycaudus helichrysi and sitobion avenae. Wheat varieties Ridely, NP. 803, NP. 809 and E. 4647 are resistant to this disease.

Barley Mosaic and Cereal Yellow Dwarf: In addition to barley, these two virus diseases are also found on wheat. Barley mosaic is characterised by chlorosis and mottling of leaves. Cereal yellow dwarf produces stunted plants with profused tillering and yellowing of leaves. Both the diseases are transmitted in nature through the agency of the aphids, Rhopalosiphum madis. These diseases on the wheat crop deserve a close watch under field conditions. Efforts are being made to locate the sources of resistance to these virus diseases.

Rice

Leef Yellowing or Tungro Virus: This disease is characterised by marked stunting. Older leaves turn yellow orange starting from tip and margins. Frequently the affected plants bear poor panicles with empty glumes showing dark brown colouration. The disease is transmitted in nature through the leaf hopper vector, Nephotattix impicticeps. Rice varieties Pankhari 203 and Intan are resistant to this disease.

Yellow Dwarf Virus: The infected plants are stunted, chlorotic with large number of tillers having no spikelets. The vectors of this disease are Nephotettix impicticeps and N. apicalis.

Orange Leaf: Infected leaves are rolled upwards and turn orange yellow in colour. The affected plants die prematurely. The vector of this disease is a leaf hopper. Inazuma dorselis.

Grassy Stunt: The diseased plants remain stunted with perused tillering giving grassy appearance to the plants. The disease is transmitted in nature through the plant hopper vector.

Nilaparvata lugens: The first two virus disease i.e. leaf yellowing and yellow dwarf prevalent in India on varieties Taichung Native-1 and I.R. 8. Orange leaf and grassy stunt are also suspected to be present in India. The vectors which transmit these diseases from diseased plants to healthy ones are also found here. Breeding for resistance and control of insect vectors are the two lines of attack for the control of the virus diseases. The work on these two lines is in progress.

Maize

Mosaic virus disease is of common occurrenc in maize and its incidence varies from 2.1 to 10.5%. The virus is aphid transmitted and infects many grasses and millets, Affected plants are pale green in appearance, slightly stunted and show mosaic mottling. Ganga 101 Ranjit and Deccan hybrids and Jawahar and Kisan composites are resistant to mosaic virus disease.

Ragi

A new virus disease of Ragi (Eleusine coracana) has been observed from Mysore State. The disease is characterised by severe mosaic mottling, chlorotic streak, stunting and failure to flower or poor seed setting, profuse lateral shoot formation and production of aerial adventitious roots. The virus has been found to be sap transmissible. At least five species of aphids viz. Rhopalosiphum maidis, R. rufiabdominalis, Aphis gossipii, Myzus persieae and Macrosiphum granarium have been found to be the vectors of this virus. Because of the large number of vectors present in India, which can spread this virus, the disease is capable of devastating the ragi crop in a short period, depending on the population of these insects. It may be interesting to mention here that these insect vectors are found not only on ragi but also on a number of other crop plants and weeds. To keep the disease under check efforts are being made to find out germ plasm resistant to the disease.

FERTILISER DEFICIENCY

Fertilisers supplement the requirements of plant food for healthy crop. An experienced eye can notice whether his crops are well fed or are suffering from hunger. The following are some of the signs of hunger in various crops :—

Nitrogen Deficiency

Nitrogen deficiencies are not so easy to detect in the early stages of growth and severe symptoms rarely appear until after the plants have passed the initial stage. Neverthless, if young plants tend to have a light yellowish-green appearance as contrasted with the dark green of healthy plants a nitrogen shortage is indicated. This usually can be corrected by side dressing.

A distinct slow and dwarfened growth is also an indication of nitrogen deficiency. Moreover yellowing at the tips of the lower leaves, gradually spreading down the midribs of the leaves and to the leaves higher on the plant also indicate nitrogen deficiency. This could be cerrected to some extent by top-dressing at the time of the first sign of the symptom, but if noticed at the last stage it would have past the stage of the top-dressing, and would give guidance for next year's crop.

Phosphate Deficiency

Phosphate deficiencies usually appear when the plants are very young. The symptom is a reddish purplish marking of the leaves, stems and branches. Phosphate also controls, stalk size and ear head. Weak, spindly stalks either barren or with small twisted ears are pretty good signs of phosphate shortage.

Potash Deficiency

Potash deficiency shows up as browning along the edges of the leaves nearest the ground. Another symptom is darkish-brown discolouration of the nodes of the stalk, which may be revealed by slicing the stalk lengthwise. Mottling, spotting, streaking or curling of the leaves starting from lower level is also an indication of potash deficiency. Falling down of the plants prior to maturity due to poor root development will be due to the shortage of potash. Premature loss of leaves and small, knotty, poorly opened bells in plants like cotton will be the signs of potash deficiency.

In recent years, trace or minor element shortages have become a problem on some soils. It will be desirable to know the indications of their shortages which are as under :

Calcium Deficiency

Wrinkled appearance of the leaves, in some cases young leaves remaining folded and a light green band along the margin of the leaves are the indications of calcium deficiency.

Sulphur Deficiency

Light green colour in young leaves, with also lighter veins, short slender stalks, slow stunted growth, sprouting of leaves as with potatoes and light green coloured immature fruits are the indication of sulphur deficiencies.

Magnesium Deficiency

A general disappearance of green colour which would start in the bottom leaves and moving up to the stalk is an indication of magnesium deficiency. Definite and sharply defined series of yellowish-green, light yellow, or even white streaks throughout the entire leaf is another indication. Upward curving of the leaves along the margin is also a sign of magnesium deficiency.

Moreover a severe copper shortage will show up in young plants as a drying of the tips of the upper leaves and a twisting and drying of the younger leaves. While uneven growth, with some plants being normal and others nearby being severely stunted may be an indication of zinc deficiency.

On all fertilised fields high plant populations, blank stalks and barren ears may be an indication of boron deficiency. If this condition shows up, about 10 pounds per acre of borax should be applied to the next crop. This may be side-dressed, atleast 8 inches away from the crop, at the time of the first or second interculture.

Acid soil will seriously affect the uptake of plant food elements, and may cause deficiency symptoms to appear even though the soil is well fertilised. Acid soil also may cause discolouration and decay of the lower parts of the roots, particularly when the brace roots shoot from the third or fourth node. A soil test is, of course, the simplest method of checking for soil acidity which should be corrected by adequate liming. Lime is also a source of calcium and of magnesium in the case of dolomite limestones.

When hunger signs appear, particularly of the primary plant food elements, the soil is badly depleted. A good farmer never permits his plant food bank account to become so seriously over-drawn.

Even such seriously depleted soil may be restored and yields raised to profitable levels by proper fertilisation and liming. Disease and insect problems can be controlled with sprays and dusts.

The combination of proper fertilisation, based on soil tests, or on recommended doses, with good management praetices will raise crop profits.

Farm News

GRAIN SITUATION

Summary

World production of cereals (including rice) reached a record in 1968/69, with output in the developing countries up the second year in succession, partly under stimulus from new technological successes (whose future growth remains dependent on the pace at which corollary needs can be met).

Early prospects point to another favourable world harvest in 1969. Since good crops were recorded in both importing and exporting areas trade in 1968/69 declined significantly, while stocks in exporting countries increased. Carry-over supplies of all grains, especially wheat, are now ample. Prices have been under pressure. There is no psospect of a sharp change in the supply-requirements situation in the near future.

Specifically with respect to rice, over-all shortages common in earlier years have given way to growing self-sufficiency in several major importing countries and to the emergence of unsaleable surpluses in some exporting countries. This development has continued in 1969, favoured by some success in the adoption of high-yielding varieties under expanded irrigation and fertilizer use. FAO's study Group on Rice emphasized the desirability of international co-ordination of national policies, and proposals for an international rice agreement were submitted by the Philippine Government.

World Situation and outlook

World production of cereals (including rice) in 1968/69 reached the record of 800 million metric tons, compared with a 1963-65 average of 660 million tons.

In developed countries aggregate grain production was about the same as in 1967, whereas in developing countries it rose for the second year in succession to level now 15% above that of 1966. As most of the main exporting and importing countries harvested good to excellent crops, there were increased exportable supplies and lower import demand in 1968/69. Consequently there was a significant decline in world trade grains of the order of about ten per cent in 1968/69. The fall was concentrated on shipments on special terms reflecting the better crops (including rice) in developing countries and particularly in India and Pakistan. Commercial trade in grains is not expected to have been much lower than in the previous season.

Prospects for 1969 point to another good world grain harvest. Excellent spring crops have been produced again on the Indian subcontinent. In North America, the areas under wheat will be smaller and this will probably also be the case in Western Europe. These declines may partly be offset in some countries by higher wheat yields, and by larger sowings of coarse grains. In the U.S.S.R. and Eastern Europe grain production was affected by adverse weather conditions early in the season. If weather conditions are favourable, this loss could be offset.

World exportable supplies of grains will remain ample in the 1969/70 season. The main exporting countries hold a sizeable surplus of wheat and their carry-over stocks of coarse grains have also risen. Yet, next year's trade is unlikely to turn out larger than in 1968/69 and it will be some time before the recent trade level for wheat of over 60 million tones can be regained. The world supply situation for rice has eased and surpluses now exist in some countries.

COFFEE

According to estimates of the United States Department of Agriculture, world coffee production in 1960/69 may be about 10% lower than in the previous year at approximately 3.7 million metric tons.

The fall is the estimated result of eradication measures and bad weather in Brazil, where a 28% decline in output is forecast, and of poor weather conditions elsewhere, notably in El Salvador, the Ivory Coast, and Indonesia. The drop in output in 1968/69 is expected to lead a further decline in world exportable of 14% compared with production the previous year. However, initial

export quotas under the International Coffee Agreement total only four per cent less than the final quota for 1967/68. The level of exports may not therefore change much and stocks in producing countries probably will decline.

African robusta producers, facing a bumper crop this year,are in a somewhat difficult situation. Brazil's vigorous sales compaigns are said to have made serious inroads into the traditional robusta markets on the European continent.

TOBACCO

Production, trade and consumption of tobacco have risen throughout the world in recent years despite medical warnings against smoking and the outlook is for still further increases.

Approximately three-fourths of all tobacco consumed in the world trade, tobacco plays a significant role in the foreign exchange earnings of quite a number of developing countries.

World tobacco production in 1968 was abaut 9,900 million pounds, down four per cent from the record high in 1967 but over 11% above the 1960-64 average. Trade sanctions have caused a large build-up in Rhodesian stocks, and plantings for the 1968 harvest were reduced sharply. Plantings for the 1969 crop appear to be in good condition.

The 1968 production picture was mixed in other major flue-cured and burley exporting countries. India's production was down because of reduced acreage, early drought and heavy mid-season rains. India's exports, which recovered sharply in 1966/67 level, may be lower in 1969. Canada produced a slightly larger crop on a some what smaller acreage; exports in 1969 are expected to be close to 1968 shipments.

JUTE

World production was substantially lower in 1968/69 due to sharp falls in output in India, Pakistan and Thailand.

Fears of an impending shortage of supplies drove prices beyond the agreed indicative range of the FAO Consultative Committee on Jute, Kenaf and Allied Fibres in November 1968 and little change occurred in the remainder of the season. World imports are, however, likely to remain stable as a result of a run-down in carry-over stocks in Pakistan and Thailand. India's heavy purchases in mid-season will largely offset the significant decline in most Western European countries and the United States.

Following the high prices of 1968/69 a bumper crop may well be produced in 1969/70, with a consequent easing of prices. Pakistan's jute goods industry maintained its rapid growth and further weakened India's position on world export markets.

COCOA

Estimates of production for 1968/69 (are) 1,229,000 metric tons, lower than the previous estimates and some 123,000 tons less than the 1967/68 production

The lower figure was mainly due to the continuation of the extremely heavy rains in West Africa and the heavy rains which affected the cocoa producing areas of Brazil. The consumption (grindings) forecast for 1969 was 1,344,000 metric tons, about 40,000 tons less than the actual grindings for 1968. Production will therefore not match estimated consumption in 1969, the fourth successive year in which there will have been such a shortfall. As a consequence, prices have risen to exceptionally high levels.

WOOL

Wool consumption rates in major manufacturing countries during the first half of 1969 likely will average above the moderate levels of late 1968. Textile inventories in these countries do not appear excessive, prices paid for raw wool have not risen, and imports of raw wool through the end of last year were increasing.

All of these factors point to relatively large consumption in the first half of the year. Large mill use in the first half, however, could lead to a build-up in textile inventories. If this occurs, mill intake of raw wool probably will decline, possibly by next fall.

Prospects are for world prices to continue firm through mid-1969, but price trends in the second half of 1969 may reflect replenished working stocks of raw wool in major consuming countries, and possibly larger stocks in intermediate wool textiles that may in turn lead to some decline in mill intake of the raw fibre. This points to weaker prices. However, wool prices this fall also will depend on whether world production continues to increase, despite relatively low wool prices that have persisted during the last two and one-half years.

CITRUS FRUIT

The output of citrus fruit in 1968/69 has shown some recovery from the setbacks suffered in 1967/68.

Production of oranges increased in the United States though it was still five per cent below the 1966/67 level. Frost damage in December 1968 in Florida, California and Arizona substantially reduced the potential output and also the juice content of Florida-type oranges. In the Mediteranean, a further fall in production is envisaged, due to bad weataer, particularly in the main exporting countries, Spain, Morocco and Israel. In contrast, the Northern Hemisphere grapefruit crop should reach a new record owing to a considerable rise in United States output, unaffected by frost damage.

THE AGRICULTURAL SITUATION

Growth of real incomes of agriculture in 1968/69 was impaired in most countries by price trends with respect to receipts as well as expenditure.

Inflation has put an increasing strain on farm accounts and farm budgets. Inflation also reduced the favourable impact of general economic growth upon agriculture, and the restrictive measures taken to curb inflation and to correct external imbalances may not for long remain without some retarding effect upon general economic developments.

Developments in agriculture, however, were not uniform and there were also some brighter spots, depending upon the commodities involved. World prices for cereals, cotton, sisal and henequen, and tea were down, those for some vegetable oils, jute, abaca, natural rubber, and free market sugar showed considerable improvement. Crop reduction in the face of strong demand caused a boom in cocoa prices—much reduced in its impact upon farm receipts by the decline in quantities and skimming of export returns. Intense competition in export markets is foreseen for bananas due to a strong increace in supplies. The more distant outlook for citrus fruit faces the same prospect.

The international dairy siuation continues in great difficulty due to the grave imbalance that has developed on the continent of Europe. In the United States the exodus from the industry and decline in output continues. Early action on an international agreement on floor prices for exports of butter and skim milk is essential; the GATT Agricultural Committee has not as yet been able to reach an understanding. Strong demand for beef, at firm prices, should be maintained through coming years.

Over-all receipts of developing countries from exports in 1968 went up by a small percentage, but those of developed countries fell because of over-supply of most temperate zone products in relation to import opportunities. The export gains of the developing countries come from a number of commodities, mainly coffee, cocoa, cotton, rubber, jute, and some vegetable oils.

As far as the food situation in the problem countries is concerned, recent developments give little ground for optimism, although some improvement has taken place with improvements in economic growth and income and/or local food output. Good weather in the past two years and the progress of technology in Southeast Asia have been factors.

In the growth of total food output in developing countries the increase in harvested area has been much more important than the increase in yields. Experts doubt that expansion of the areas under crops in the tropical belt can continue at the pace of the past twenty years.

With population increasing at altogether unsustainable rates, the yield increases in those countries would therefore have to attain extraordinary proportions in the near future if measurable per caput improvement in food supplies there is to be achieved. For some time to come, not only food aid, but encouragement and help by developed countries for the population control efforts in the poor areas of the world are imperative.

As we look to the more distant future we find not much in developments of the recent past that would give us hope for the food-population balance or for general balance between population and environment. Without early breakthroughs on a wide-scale with respect to population control in Asia.

MARKET POSITION OF FARMER

The family farmer's precarious market position with its lack of market power and threatened by the intrusion into farming and marketing of non-farm interests is causing increasing concern.

Whether or not the family farm, with at least most of its social, psychological and esthetic characteristics, can survive in the ever harsher climate of technological supremacy, economic growth and unbalanced affluence, is a question widely debated in the advanced countries. Developments related to this question are the growth of "corporation farming" and the call for farmer bargaining and bargaining power.

In a number of countries apprehension has been heightened by what some observers call a trend toward massive invasion of agriculture by corporate and non-farm interests. There is evidence that these interests are utilizing a number of devices, including vertical integration of food production by conglomerate corporations; purchases of huge blocks of land as a hedge against inflation and for speculative purposes; and undermining of farm markets by price manipulation, bypassing of competitive markets, and mutually advantageous agreements with chain stores and food handlers. The manipulation of markets and the movement toward monopoly may bode ill for the consumer as well as for the farmer

If large corporations and non-farm interests were to become predominant in agriculture, not only family farmers but also many other businesses, schools, churches and municipal facilities would be eliminated from rural areas. Such a development would have a devastating impact on community life and would create great human as well as economic problems.

The influence and control over a number of sectors of the production and marketing process which these large organizations obtain through vertical or horizontal intergration enables them to organize on a large scale and with reasonable stability of costs.

In pointing out these charcteristics of large organizations, a Canadian study has aptly emphasizsd the advantages to be gained by farmers if they themselves could make use of such organizational developments. The study thinks of a national marketing organization designed to operate to the farmers' benefit.

A national marketing agency for farm products, as envisaged by the Canadian study, would probably employ many of the techniques of market management that are employed by the large corporate organizations. This would involve planning of domestic and export market requirements in order to co-ordinate production and marketing programs with the over-all demand at a reasonably stable and adequate price level. The agency could also undertake at a national level the promotion of food products. Marketing research and market development could be another important function of the national agency.

Whether or not the route would be through the establishment of

national market agencies, there are well-known developments that tend to produce some sort of administrative co-ordination between farming on the one hand and processing distribution, and farm supply manufacuring on the other. Vertical integration is one form of it, but several forms are possible: integration by non-farm firms through ownership, contracts down by non-farm firms with farmers, arrangements between farmer co-operatives and buyers or suppliers, and still others.

DAIRY SITUATION

Future Outlook

The short-term prospect for the current year suggests that milk production in Western Europe will be only slightly higher than in 1968; unless weather conditions in the second half of the year are unusually favourable, it is indeed possible that production will show no rise at all, and in some countries—most parts of Scandinavia, Switzerland and Austria, and perhaps Britain—it may fall short of last year.

In the United States, the decline of the last three years is expected to continue, but in Canada production in the early months of the year was markedly up in 1968. In New Zealand, a new record is expected for the current season, but in Australia production may not be very different from the previous year. In the Soviet Union, the slowing up in the rate of expansion witnessed in 1968 might well continue, as the start of the new season was affected by bad weather.

COTTON

For the first time in many years, world production and consumption in 1968/69 are in equilibrium. Moreover, the quality distribution of the supply is better balanced than has been the case in other recent seasons. Despite these optimistic factors, however, problems of considerable magnitude still confront the world cotton economy.

World use of cotton remains at around the record level, but consumption failed to make any real headway in a rapidly growing fibre market this season, primarily because of the competitive gains of the man-made fibres. World trade in cotton remains below the level of two years ago and, considering the decline in prices, total export earning from cotton dropped this season.

RISING INDIAN GRAIN OUTPUT

India's food situation has been improved markedly by prospects of a good harvest in 1965/69 and the sharp increase in food grain production in 1967/68.

Wheat output for this year is estimated at 18 million tons, 1.4 million more than last season. Production of coarse grains (sorghum, corn, millets and barley) is estimated at 26 million tons, down 2.9. million from last season, mainly because of dry weather in major producing areas.

Food grain imports in 1967/68 from all sources, excluding donations and overland imports from Nepal, totalled 8.1 million tons. including 6.4 million of wheat. This compares with 9.4 million tons imported in 1969/67 and 8.9 million in 1965/66. In the first six months of the present season, imports have totalled only 2.2 million tons.

Prices of most food grains, except rice, in 1968 were generally lower than the year before, Wholesale prices for food grains averaged six per cent lower.

Central and State reserve stocks of food grains which in early 1968 had reached on all-time low, totalled over 3.5 million tons at the beginning of 1969.

FEWER RAISINS

The 1969 raisin crop is in trouble. Frost in Turkey and rain in Australia and South Africa have dampened this year's raisin crop prospects. Reports indicate the 1969 Australian pack will not be more than 28,000 short tons of sultanas, compared with 74.000 tons a year ago.

In South Africa, quality has been much harder hit than quantity because of heavy rains.

In Turkey estimates of 20%-50% frost damage are reported.

RISE IN INDIAN POTATOES

Indian farmers are planting more potatoes than ever before.

In the post decade, potato production has more than doubled in India rising from less than two million metric tons a year to more than four million tons. Government thorities forecast a continuing sharp rise in potato production in the years ahead, especially in view of new high yielding varieties of potatoes being used.

Yield per acre is now put at nearly 7,500 pounds.

x x x

India is exporting less tea. In 1968, Indian tea exports totalled 459.5 million pounds, 25% below the previous year. Lower sales to the big United Kingdom market were the main cause of the drop.

x x x

The sixth annual "British Growers Look Ahead" National Conference and Exhibition will be held in Sussex, April 14-16, 1970. The Conference and Exhibition is under the sponsorship of the National Farmers Union.

VOICE OF BAPU

When can be more natural than the Hindus and Mussalmans born and bred in India having the same adversities, the same hopes, should be permanent friends, brothers born of the same Mother India ?

Let all of us—Hindus, Mussalmans, Parsis, Sikhs, Christians—live amicably as Indians, pledged to live and die for our motherland. Let it be our ambition to live as the children of tbe same mother, retaining our individul faiths and yet being one, like the countless leaves of one tree.

Wheat Cultivation . . .

(*From Page No. 4*)

seedrate of 90 to 95 kg/ha for drilling, 15-18 kg/ha for dibbling and a seed rate of 20-25 kg/ha will be desirable for transplanting. For dwarf wheats 100-125 kg/ha should be used and for Sonora 64 a seed rate of 125 kg/ha has been recommended. Seed treatment with Agrosan G.N. (114 grams per 40 kg of wheat seed) should be done. Sowing of seeds of *Desi* wheat should be done from 15th October to the end of November, Some of the fields do not come in proper condition of the ploughing because of the swampy land upto December and therefore, in these areas 30 days old seedlings can be transplanted at a distance of 25 cm X 25 cm. It has been recommended that sowing of S227 and Lerma Rojo should be done at the same time when all wheat varieties are sown and around Delhi it is first fortnight of November, whereas Sonera 64 should be sown a fortnight later. Bhardwaj and wright (1967—Indian Farming 17(5) stated that sowing of dwarf wheat can be done two weeks later than the normal for tall varieties and Sonora 64 can be sown even in late December. The seeds of Mexican varieties of wheat should be sown 4 to 6 cm. deep in a pre-irrigated or moist seed bed. Deeper sowings do not give good results of germination. Seeds of *Desi* varieties of wheat should be sown at a distance of 15 to 22 cm. apart with a seed-dril. Mexican Varieties of wheat are to be sown at a distance of 12 to 15 cm. between the lines and as far as possible a distance of 7.5 cm. to 10 cm. may be followed between the plants.

Inter-Culture and Irrigation:

One hand weeding or spraying of 2, 4—D at the rate of 1 to 1.25 kg/ha acid equivalent in 900 litres of water after six weeks of sowing is helpful in removing the weeds from the field. Three to four irrigations at tillering, flowering and grain filling stages should be given. If only two irrigations are available one irrigation should be given at the time of flowering or grain filling stages depending upon the climatic and edaphic conditions. Mitra and Tripathi (1964 and 1965. Theses submitted for M.Sc. (Ag.) to the University of Saugar) found at Rewa that three irrigations with 56 kg/ha nitrogen and phosphorus each gave 5296.80 kg. grain and 5260.68 kg. Bhusa per hectare and the net profit was Rs. 785.29/ha. The recommendations made by the wheat Agronomists workshop June 14-16 at IARI, New Delhi (1967—Indian Farming 17(5): 27) were that for the dwarf wheat the first irrigation should be given at the time of crown root imitation which comes in 3 to 4 weeks after sowing. Thereafter 3 irrigations should be given at the late tillering, flowering and dough stages on loam and heavy soils. At dough stage, irrigation should be given on calm day. In sandy soils two or more irrigations may be required. Bhardwaj and Wright (1967—Indian Farming 17(5): 39) stated that in dwarf wheat the field should be pre-irrigated about one week of sowing and the first irrigation should be given when the crown roots and tillers are appearing 21-25 days after sowing and subsequent irrigations will depend upon soil textu e and temperature, but the crop should not be allowed to suffer at any stage for the want of water. The irrigation at the grain filling stage important. Wright (1968—Indiain Farming 17 (10) summerized the research information from co-ordinated wheat Improvement Project as follows (1) seed sowing should be done in a moist seed bed and if 5 cm. soil is not moist, one pre-irrigation 5 to 7 days before sowing should be given (2) The first irrigation in dwarf wheat should be given 21-25 days of sowing (3) From jointing to flowering the number of irrigations may vary depending on the soil moisture and 5 irrigation in sandy soil and one to two irrigation in clayey soil should be given. (4) One to two irrigations may be given during grain filling stage and irrigation may be given in a calm day to avoid lodging. (5) In each irrigation enough water should be applied and the plants should not be allowed to suffer without irrigation at any stage. Kanwar (1968—Indian Farming 18 (3) stated that at IARI, it was observed that four irrigations produced as much yield of wheat as six irrigrations. He further noted that in Sonora 64 and S227 wheats, there were four critical stages for the application of water and they were at the crown root initiation which is 20 days after sowing, at earning and at dough stage. Any delay at crown root initation stage affected the crop adversely.

In brief the following irrigational schedule may be followed for dwarf wheat (i) the first irrigation after 20-25 days of sowing (ii) Second irrigation after 40-45 days after sowing (iii) third irrigation after 60-70 days of sowing (iv) fourth irrigation 80 to 90 days of sowing (v) fifth irrigation after 100 days of sowing and sixth irrigation after 120 to 130 days of sowing. The last two irrigations should be done with great care and should be given as and when required.

Harvesting and Yield

Harvesting of wheat crop is done in March and April when the grain is dead ripe and the straw is golden yellow in colour. The yield of grain crop varies from 709 to 800 kg/ha under unirrigated conditions but where irrigational facilities are available 1000-1400 kg/ha can be obtained under scientific methods of cultivation the dwarf wheat crop gives about 60 to 80 q/ha.

Portable Assembling Plant

The Soviet aided tractor plant in the private sector at Gaziabad (UP) will assemble 10,000 tractors during 1969. These tractors will have 40 to 50 per cent indigenous contents.

Soya Meat

An artificial meat almost similar to natural meat in taste and elasticity has been developed in Japan from protein of Soyabeans,

Modern Poultry Dressing Plant

India's biggest and the most modern poultry dressing plant has been set up at Poona at a cost of Rs. 30 lacs having capacity to dress one thousand birds an hour under the most hygienic and sanitary conditions.

Fertilize Crop Through Their Leaves

By Rollie Henkes

Foliar Fertilization Solutions of nutrients are sprayed over the growing crop for intake through the leaves, in contrast to conventional application on or in the soil for intake through roots.

The practice is fast moving out of the realm of research into practical application and it is pertinent to ask where it fits in the crop production schemes of today.

Actually, foliar fertlization isn't a completely new practice. Sprays containing secondary and micronutrients such as iron, magnesium and zinc have been used for many years on some vegetables and other speciality crops. Plants require relatively small amounts of these nutrients, and foliar sprays has been found to be an efficient way to apply them.

Lately, interest has expanded to foliar sprays on major field crops including maize, paddy, cotton, soyabeans and sorghum. In addition to this, a close look is being given to foliar applications of the major nutrients of nitrogen, phoshorus and potassium.

Qualified Enthusiasm.

From New Delhi, India, to East Lansing, U.S.A., agronomists generally agree that foliar fertilizer does have a place in modern agriculture. Indeed, some have called it a milestone. However, they temper their remarks by pointing to some very definite limitations.

For one thing, it is extremely difficult to supply most or all of a plant's nutrient needs through leaf intake. Leaves cannot absorb large amounts at one time and are scorched or damaged by heavy rains. Therefore, exclusive reliance on foliar feeding would requie frequent, small applications throughout the growing season, a wholly impractical situation. Heavy, single applications can be made to the soil because it serves as a reservoir of nutrients for root uptake over long periods.

However, once a crop's primary needs have been met through soil applicatiou, foliar fertilization can possibly play a supplementary role during critical stress periods when plants, for a variety of reasons, cannot absorb enough nutrients through the roots.

But the concensus is that foliar feeding should not be tried until you have accomplished all you can on other fronts to increase yields. "Use it as a supplement to sound cultural practices, not a substitute," says S.H. Wittwer, horticulturist at Michigan State University, East Lansing, Michigan, U.S.A., who has experimented with foliar fertilization for many years.

The material used in foliar applications are clear fertilizer solution. The suspension and slurry type fluid formulations, which contain undissolved salts, are not used.

A wetting agent, or surfactant, is often added to improve absorption through the leaf. The nutrient must penetrate the cuticle, a thin film on the leaf surface whose thickness depends on the plant and climatic conditions. Stomata have also been considered as portals of entry for foliar applied nutrients, with high absorption rates correlating with high numbers of stomata, according to some studies.

The Major Nutrients

Applying the major N-P-K nutrients via foliar sprays is still an infant practice and not yet supportied by extensive research findings. The exception might be applying nitrogen through urea sprays. Urea sprays on the foliage of paddy and other crops have been quite successful in many instances. This is explained by the fact that the nitrogen in urea is absorbed rapidly by the leaves10 to 20 times faster than most other nutrients, such as phosphorus.

Urea Sprays on Paddy

Here's what happened in tests with urea sprays on paddy as reported by Rajat De, N.K. Mohta and S.K. Sharma in Indian Farming. Applying half of the nitrogen in a urea foliar spray and half through the soil proved much more effective than the same amounts applied through the soil alone. This was true for rates up to 160 kg. of nitrogen per ha. And to show the efficiency of the urea spray, applying 40 kg. of nitrogen on the leaves and 50 kg. through the soil produced as much yields as 160 kg. through the soil alone. In the same trend, yields from 240 kg. of nitrogen through the soil did not produce yields significantly different than those from a combination of 80 kg. on the leaves.

The tables opposite give results in more detail. In the soil applications, 75 per cent as applied three four days before puddling, and the rest topdressed 30 days after transplanting. Four foliar applications were made at five to seven day interval for the 80 kg. rate and in six equal applications for the other two rates, begining 25 days after transplanting. Urea concentrations for the 40, 80 and 120 kg. foliar rates were 2.2, 3.7 and 4.4. per cent respectively. 8-300 was used as surfactant. All plots received applications of phosphorus and potassium.

This test and others indicates that a foliar urea spray can boost yields and fertilizer efficiency in paddy, a crop where heavy soil applications are sometimes subject

to losses through leaching and denitrification.

Paddy has not been the only benefactor of urea sprays in India. V.K. Gupta and Vig A.C., agronomists at Punjab Agricultural University, Ludhiana, India, state that urea has been tried successfully on a number of field crops, at rates of from 5 to 15 pounds of urea in 100 gallons of water.

On Potatoes

Effect of nitrogen and phosphorus foliar sprays on potatoes was studied by two other Indian agronomists, S.K. Mukherjee and Ratjat De, of the Indian Agricultural Research Institue at New Delhi. They found that a combination of soil and foliar applications produced higher yields than relying exclusively on soil applications. The soil-foliar combination was also better than applying all of the nutrients via foliar only, emphasizing the supplementary nature of foliar fertilization.

The yields and income produced by various combinationsusing a total rate of 120 kg. of nitrogen plus 80 kg. of phosphate were higher. The best results came from applying half of the fertilizer on the soil at planting and the other half through a series of five foliar sprays beginning 25 days after planting. The spray was a 3 per cent solution of nitrogen and phosphorus with urea serving as the nitrogen source and triple superphosphate as the phosphorus source. The agronomists stress that the primary value of foliar fertilizer (at least in the case of potatoes) is to supply the nutrients at critical stages of growth. They also note that the urea applied to the foliage not only enhanced its own absorption but that of other nutrients as well.

Also, the foliar applications produced more yield response from a given amount of nutrient than the soil applications. Because of their efficiency the supplemental foliar applications allowed a substantial reduction in amounts of nurients applied, resulting in a higher net income even after meeting the extra cost of application.

In the United States, agronomists with the Trojan Seed Company, Olivia Minnesota, have experimented with liquid N-P-K foliar fertilizer on maize. Certain formulations and timing resulted in significant increases, while there was no response from other treatments. Irv Parker, technical services director of Trojan says their work indicates foliar N-P-K applications can be beneficial but must be used as a supplement to a conventional fertilization program.

Foliar N-P-K fertilizers have given them the best results when applied immediately or shortly after the silks have been fully pollinated or turned brown. Phosphorus is critical to grain development during this time, and it appears difficult for the plant to secure it in sufficient quantities through the roots. Their best results have come from mixing 2, 4 or 6 gallons of such N-P-K. liquids as 6-18-6, 7-21-7 or 10-30-40 with five to eight gallons of water, and applying them directly over the leaves or between the ear and the top leaf. Higher rates may cause leaf burning.

Maize in the Trojan tests was well fertilized through the soil and did not respond to foliar sprays earlier in the season. However, application immediately following pollination resulted in as much as a 13 bushel advantage.

The Minor Nutrients

Foliar application of the minor nutrients is a well established practice in many areas. These nutrients include calcium, magnesium, iron, manganese, zinc, boron and molybdenum.

They lend themselves to foliar application because small quantities can satisfy a plant's needs. Also, leaf absorption is much more efficient than root absorption. Writing in Fertilizer Solutions Magazine, L.R. Monall of Leffingwell Chemical Co., Brea, California, USA, reports that one pound of zinc applied to the leaves is as effective as 12 pounds applied to the soil. It would take 25 to 100 pounds of soil-applied iron to match one pound of foliar applied iron.

Wittwear of Michigan State University reports that deciduous fruit trees, citrus, grapes, vegetable crops, plantation crops, soyabeans, potatoes, field beans and maize may respond to foliar sprays of specific minor nutrients. He says there are numerous examples of responses to foliar sprays of iron, manganese and zinc and to a lesser extent copper, boron and molybdenum.

He cites one test in which two sprays of zinc sulphate at one pound of zinc per acre increased yields of Michigan field beans by 23 bushels per acre. In California, a 3 per cent spray solution of ferrous sulphate boosted grain sorghum yields to 4,000 pounds per acre, compared to only 250 pounds per acre, compared to only 250 pounds for the non-sprayed crop. Soyabeans have responded well to one or two manganese sprays.

Excessive rates will injure plant foliage. McNall, of the Leffingwell Chemical Co., points out that foliar zinc sprays were developed over 30 years ago to correct zinc deficiencies in citrus. He adds that the use of phosphate with zinc provides a synergistic effect; that is, zinc absorption with phosphate is more effective that with zinc alone.

McNall has the following advice on timing foliar sprays of minor elements. Just prior to and during seed formation is best in such crops as barley, wheat, lucerne, grain sorghum and rice. The best time for maize is when the tassels are first appearing.

On cotton, several applications from the seedling stage upto where bolls are half grown have given an earlier and heavier set and higher quality lint. For deciduos fruits and berries, the first application should be made at bud break followed by another application about three weeks later. On beans and peas, significant yield increases have been gained by an application prior to bloom followed by another in two to three weeks.

Another reason that foliar sprays could become more important in the years ahead is that imbalances are appearing in many soils with continued heavy application of major nutrients (NPK). Wittwer says we can expect greater frequency of minor nutrient deficiencies in the major food crops, with corresponding improvement in response to foliar applications.

Green Revolution Sprouts in Himchal Fields

After the harvesting of the present Kharif crop, Himachal Pradesh expects to supply more than 65,000 quintals of maize to other states of the country after meeting the internal requirements. This complete reversal in the position from deficit to surplus has been achieved by the farmers of the Pradesh by using hybrid and Composite varieties of maize, by adopting improved agricultural practices and plant protection measures. Timely and abundant rains have also helped to achieve this miracle because Himachal Pradesh was once considered a perpetually deficit area.

On the eve of sowing of the peresent Kharif crop, Lt. General K. Bahadur Singh, Lt. Governor Himachal Pradesh has predicted a bright future for Himachal Pradesh as far as foodgrains were concerned. He hoped that soon Himachal Pradesh would be supplying foodgrains to other states. In the very first maize crop this has been proved to be fact. General K. Bahadur Singh took a keen interest in this aspect of the cropping pattern.

Mandi Package Programme

With an area of 13,000 acres covered with hybrid and composite maize varieties out of 75,000 acres under maize crop throughout the district, Mandi district is perhaps the first district in the country to have saturated about 16 percent area with these varieties. Almost a third of the entire area is said to be unsuitable for the hybrid varieties.

The target of 30,000 acres to be covered with hybrid varieties has been more than achieved as about 31,000 acres were brought under these varieties.

This has greatly encouraged the field workers of the Department of Agriculture who are poised now to plunge with more determination into the ensuing Rabi crop.

It is estimated that there will be abouth 15% to 20% increase in yield per acre over the last year yield. Ganga-3, Ganga-5, Him-123. Ambar and Vijay are the varieties which have been extensively used throughout the Pradesh.

A Story of Dedicated Work

The Department of Agriculture under the stewardship of Dr. B.S. Jogi, Director of Agriculture, Himachal Pradesh prepared a comprehensive but not too ambitious a plan to put about 30,000 acres of land to the cultivation of hybrid and composite varieties. Hybrid seed and other agricultural implements were procured well in time and placed within the easy reach of the farmers. Training camps of short duration were also held to acquaint the farmers with the improved practices of farming. In fact the base for this take-off was laid much earlier in the precious few crops when demonstration plots were laid out in various strategic parts of the Pradesh so that farmers could see for themselves the advantages of the hybrid and composite varieties.

Then a dry spell in early June brought a set back and the earlier sown maize in many acres did not sprout and re-sowing had to be undertaken in all such areas. But thence onwards, regular and abundant rains have proved a faithful ally of the farmers.

Fearing a slump in prices of the maize due to this unprecedented crop, all efforts are being done to procure as much of the yield as possible so as to stabilize the prices and help farmers get a good return for their produce.

Zinc Deficiency in Soil

There are many factors which contrtbute to zinc deficiency in the soil reflecting in various hunger signs of crops. Heavily leached soils, sandy soils, calcarious or soils with high content of organic matter, soils having high levels of phosphate (either native or induced) and soils with PH 6.0 or above, are normally low or deficient in zinc. Removal of surface soil during land leveling operations, erosion or chemical reactions in the soil reducing availability to the plant of zinc ions are other factor which may contribute to zinc deficiency.

Normally, field crops having a life span of a season or a year may not display zinc hunger signs but perennial fruit trees and shrubs after a few years' yield invariably show deficiency syptoms. It is well-known that improper ratio of phosphorus and iron to zinc intensifies the zinc deficiency condition of the soil.

In addition to other nutrients, zinc is necessary in the formation of harmones in the plant. The lack of harmones formation accounts for stunting and death of terminal growth. Zinc is associated with activation of plant enzymes thus effecting plant growth, protein synthesis and seed or grain production.

Amongst crops maize, tobacco, beans, grapes, apples and peaches, citrus, coffee and mangoes are known to respond very well to zinc application.

General chlorosis of new leaves, resetting, shortening of internodes broad and longitudinal yellow striping of older maize leaves, little leaf in citrus, curling, cupping or rolling of leaves all denote zinc deficiency.

Applications of zinc can be done either through sprays or by salts such as zinc sulphate to the soil.

COMMERCIALIZE CENTRAL STATE FARMS

Addressing the first conference of General Managers of the Central State Farms Minister of State for Food and Agrilulture, Shri Annasheb P. Shinde exhorted them to run these farms on strictly commercial lines and as efficiently as a progressive farmer would do. He assured them that the Ministry of Food and Agriculture would give them all support in running the farms efficiently and economically, but that it would not be able to countenance inefficiency.

The Central State Farms which were hitherto running as departmental organisations have been entrusted to the State Farms Corporation of India, a newly set up public sector undertaking, with effect from August 1, 1969.

The Conference decided to set up a Committee consisting of the Chief Engineer and the Chief Agricultural Officer of the Headquarter office of the Corporation and the General Manager of each farm to go into the working of all the farms to improve their profitability. The Conference also asked the General Managers to organise an incentive system for each of the farm under which plots of land would be handed over to a group of workers at each farm and, subject to the production of a minimum produce, this group of workers would share any additional produce that they might be able to achieve from their plot of land. A reward of Rs. 100 would be given every six months to an operator in charge of a tractor or harvester combine whose vehicle did not have a breakdown of more than 12 hours during the six months period. The Conference also decided to invite suggestions from the workers at the farms for improving the efficiency of the farms and decided to give a prize of Rs. 500 every three months to any workman whose suggestions resulted in a saving of Rs. 50,000 or an increase in the income by Rs. 50,000 at the farm.

For the maximum exploitation of machinery and manpower at the farms, the Conference decided to take up land development, land shaping and soil conservation work on behalf of private parties in areas not very far from the farms. The Conference also decided to permit servicing and repair of private tractors in the workshops of the farms on commercial terms. It also asked the General Managers to introduce a breakdown service at each of the farms of private tractors on commercial terms. The Conference also decided to render consultancy service to individuals, firms and institutions wanting advice on mechanisation of farms, etc.

Saving Jaggery Worth Crores

With more than a hundred agricultural commodities in this country which need to be stored for sale at much later dates, research and experimentation are going on all the time. From the elimination of waste in foodgrain storage, the Central Warehousing Corporation has moved on to the problem of cutting down storage losses in other commodities. One of the major triumphs of the Corporation during 1968-69 was the provision of scientific storage facility for a hygroscopic commodity like jaggery.

Jaggery comes into the market in the months of February to April and needs to be stored for about eight months. The industry is located in scattered parts of the country, in U.P., Andhra Pradesh, Maharashtra, Tamil Nadu and Punjab. Jaggery is difficult to keep under normal ware house conditions. The estimated annual production is 10 million tonnes, valued at Rs. 600 crores. About one-fourth of this production goes bad by absorption of moisture during monsoon months. The loss on account of liquidisation is Rs. 20 to Rs. 25 per quintal.

Jaggery cannot be stacked anyhow as the bottom layers cannot take load. Economic utilisation of space and moisture control make jaggery storage a rather delicate business. Special racks, use of polythene film as dunnage, control of moisture in air-tight rooms have together made the Corporation's venture at Muzaffarnagar in U.P. an outstanding success. The difference in price between jaggery stored in this warehouse and that stored in usual godowns by trade is Rs. 20 per quintal. There has been such a rush of depositors that the Corporation has not been able to accommodate a large number of them.

New Variety of Moong

A short duration variety of Moong which matures in 65 to 70 days has been evolved in Rajasthan.

The new variety "Durgapura—66-26" has been tried at the Durgapura Research Station. The yield was 460 kg. per hectare. It is suitable for inclusion in the intensive cropping pattern as it matures by the middle of june and provides sufficient time for Kharif land preparation.

'SNAPP' for Soybean

Most of the American farmers follow five step approach to improve their soybean yields, which is known as "SNAPP" programme. The five steps in the "SNAPP" approach are :—

S—Soil test based fertilisers and time recommendations.

N—Narrow row production

A—Adapted top varieties

P—Plant In time

P—Pest control.

This programme does not guarantee high yield but if it is followed the probability of yield increases will be greater.

1. S—Soil Test based fertility

Soil tests provide an initial inventory of the soil fertility level of the yield. The tests give indications of the major nutrients programme that will be needed to bring plough level to a nutrient level capable of supporting the demands for nutrients imposed by high yields. Lime to a PH of 6.0 to 6.5 depending on the way the soil test lab bases its PH measure.

Lime is needed to supply a favourable environment for rhizobia and legume roots as well as over all microbial activities eliminate possible toxicities to manganese and Aluminium in acid soil to provide optimum conditions for peak phoshorous availability and to insure near optimum availability of micronutrients needed for Rhizobia activity.

In contrast to lime there is nonlogical way in which a general recommendation for P and K can be made. Each field is a unique situation due to variables in past treatment and soil profile. It is better to take advice from extension personnel, fertiliser company, agronomists and experiment research personnel regarding application of P & K.

Making micronutrient recommendations on a general basis is subject to more problems from the plant standpoint than are P & K recommendations. The best guide to micronutrient needs is total plant analysis of soybean leaves taken at initiation of bloom.

In such lime and fertiliser according to soil test based recommendations and adjust the fertility programme as needs. Monitor the crop with total analysis of well chosen plant samples.

2. N—Narrow Rows :

It has been observed that narrow rows increases yields. In general American farms are getting at 40 inch rows all possible yields from the use of adapted varieties' fertilisation and pest control. Time of planting is also involved in determination of optimum row spacing. It has been indicated that 24 inches rows had a yield advantage.

3. A—Adapted varieties necessary.

Farmers desirous to get better soybean yields generally prefer new high yielding varieties. In addition of yield disease resistance, insect resistance, fertility response data and row to row spacing results are also taken into consideration while selecting the variety. Inoculation with proper rhizobium strain is generally good insurance for better yields.

4. P—Planting.

In America planting is done when soil temperature is high to cause rapid germination. Mostly planting is done in the month of May.

In India planting of soybean must be done in June-July as Kharif crop.

5. P—Pest control.

Soybean pests are quite numerous and damaging to yields and are getting increased attention.

It seems the chief reason for continuing to grow soybean in rows is the possible need for mechanical weed control. Proper application of weed control chemicals is a vital factor. Before application of chemicals it must be ascertained by soil examination, whether the field has got any special weed problem. Often it is found that cultivation of certain soils give an yield increase under certain conditions.

Generally it is found that much of the irrigation work Soybean has been merely application of water with little or no study of the actual time of soybean need. The critical peried in the growth of soybean from the water stand point seems to be the pod filling stage.

Spices Export Rising

Indian spices, particularly pepper, ginger, Cardamom and turmeric have become valuable during recent years.

Exports of spices maintained a steady level from 1964-65 to 1967-68. The total exports in 1964-65 amounted to to 52,850 tonnes against 52,978 tonnes in 1967-68 valued at Rs. 27.05 crores of which about 90 per cent goes to export of pepper, ginger, cardamom and turmeric.

India is the only country in the world which produces and exports spices of all kinds.

Apples New Disease

Plant pathologists have tracked out new apple disease caused by Mummularia species hitherto unknown for India which has been recorded affecting 'Khatta Red' variety and has formed the 10th record of Cauke diseases from Kulu variety.

The infection it is stated commonly initiate around large pruning wounds and it subsequently invades the branches extending up to main trunk thus resulting finally in the death of limbs.

The experiments are being conducted to check the said disease.

Donot Undermine Soil Inheriting Insects Pests

D.K. Saxena
S. V. Dhamdhere
J.N.K.V.V. Agriculture College Gwalior (M.P.)

Productive and intensified farming by use of latest intensive methods of cultivation, improved high yielding varieties, fertilisers and secured irrigations are only possible if adequate attention is also paid to the timely protection of crops from the ravages of the undermentioned soil inhabiting insect pests, which are usually undermined due to an oversight of the cultivators and extension workers.

TERMITES OR WHITE ANTS *Odontoterms* Sp., *Microtermes* Sp., & *Nasutitermes* Sp (Termitidae : Isoptera) : They are very destructive soil inhabiting pests preferring drought and darkness, damaging almost all crops, fruit trees and other economic plants throughout the Indian Union. The rainfed crops usually suffer the most. They are social and polymorphic insects of two types, the mound builders construct long earthen tunnels and mounds, the subterranian termites live in scattered chambers in the ground without giving any indication of their presence and nests. They gnaw anything which contain cellulose. At the break of the monsoon, winged adults emerge in thousands, copulate and the pair after shedding the wings enter the soil to establish a new colony. Eggs are laid by the queen @ 4000-6000 per day. hatch within a week and the nymphs develop into workers and soldiers in about 6 months. During summer the eggs give rise to reproductive forms which reach maturity in one or two years and they then emerge to establish new colonies.

Locate and destroy the temitaria either machanically or chemichally by pouring (.1% aldrin, dieldrin or chlordane emulsions @ 20-30 gallons per termitaria. Mix 5% aldrin or 1-1.5% diedrin or 5% heptachlor dust @ 10-12 kg/acre to the soil before sowing or treat the seeds at the time of sowing with 5% aldrin or 1% isobenzan (Telodrin) dust @ 10 kg/acre or irrigate the fields and apply aldrin emulsion @ 1 Lb of active ingredient with irrigation water.

CUT WORMS *Agrotis Ypsilon* & *Pseudolatia unipuncts* (Noctuidae ; Lepidoptera) : The caterpillars are stout, soft bodied, blackish or brownish or of soil colour with several stripes or spots on the body. They conceal during the day under clods, plant rubbish and in the loose soil near the plants, come out from their abodes after dusk and cut the plants at above and below the ground level. They damage potato, wheat, linseed, lentil, gram, maize, tobacco, cotton, cucurbits, crucifers, tomato, pea, bhindi, ragi etc. They destroy much more than what they actually consume and the crop appears as if grazed by cattle. Females mate soon after emergence, lay 500-800 eggs which hatch within a week and the larvae start nibbling the foliage and become fullgrown within 2-3 weeks. Pupation occurs in the soil and the adults emerge after 10-15 days. One life cycle occupies 30-40 days and 3-4 generations are completed in a year,

Put heaps of grass at various places in the field during evening hours, collect and destroy them along with the hidden caterpillars in the morning. Dust the crop and the soil with 5% heptachlor or aldrin @ 10-12 Kg/acre.

WIRE WORMS, *Melanotus* Sp. & *Agriotes* Sp. (Elateridae : Coleoptera) :

Both the larvae and adults are soil inhabitants. The larvae are long narrowly cylindrical with a hard cuticula, wire like in appearance and yellow or orange in colour. Adult beetles are brown, hard shelled, elongated, somwhat flattered and pointed. They also do considerable damage by feeding on the roots, stems and tubers of various crops like potato, oinion, bean, tomato, carrot, beatroot and cereals. Their life histories are little known.

Treat the soil with 1-1.5% dieldrin or Lindane or 5% heptachlor dust @ 10-12 Kg. per acre. WHITE GRUBS, *Holotrichiaa insulari* (Melonthidae : Coleoptera) : The grubs are fleshy, creamy white in colour and voracious root feeders. The adults defoliate the plants. The grubs destory the plants. The grubs destroy both, cultivated and uncultivated and uncultivated crops and remain confined to the upper layers of the soil. The maximum damage occurs during the rainy season and kharif crops are comparatively more severely infected. Mating takes place during night, soon after the start of rains and the eggs are laid 1"-6" deep in the soil at the rate of 2-4 eggs per hole. The eggs hatch within a fortnight, the larvae become fullgrown within a month and pupate in earthen cells inside the soil. Pupal period lasts for 15-22 days and one life cycle takes 11-16 weeks. The pests hibernate in the soil either as adults or pupae from November to June and there is only one generation in a year.

Treat the soil with 2% parathion or 5% heptachlor dust @ 10-12 kg/

acre or spray the crop with 0.03% parathion or endrin emulsions @ 60-80 gallons per acre. ROOT WEEVILS *Cosmopilites* Sp., *Cylas formicorius* and *Tanymecus indicus* (Curculionidae ; coleoptera) Both adults and grubs of *cosmopilites* bore into the rhizomes, the plants are weakened and the fruit setting is adversely effected. In case of sweet potato, the grubs of *Cylas* and adults attack the tubers and vines and as a result, the infested tubers acquire a peculiar aromatic odour, bitter taste and thus they are rendered unfit for human consumption. The *Tanymecus* (Gujhia) weevil has been assuming serious proportions during recent years on some cereals. The adults spend some time lurking below clods of earth and damage the aerial portions of the plant. The larvae damage the roots of the plants. Mating usually occurs 3-5 days after emergence and oviposition starts after 3 days. The eggs are usually laid singly in the Vines, tubers and rhizomes and at times in the soil, the grubs hatch within a week, tunnel the stems or tubers, become fullgrown within a month, pupate in the tunnels and emerge as adult weevils within a fortnight. One life cycle occupies 4-6 weeks.

Sow only the healthy tubers and rhizomes. Dust the soil and the foliage with 5% aldrin or heptachlor @ 10-12 kg/acre.

PUMPKIN BEETLES, *Raphidopalpa foveicollis* (Chrysomelidae Coleoptera':

The adults feed on the foliage. The grubs live in the soil and damage the roots of curcurbits. Ultimately the vines wither and dry and those which survive bear a few underdeveloped fruits. Eggs are laid a week after mating on the soil around the base of the plants or inside the cracks under the plants, hatch in 6-15 days, the grubs bore into the roots and the fruits touching the soil, become full-grown in 3-4 weeks and pupate 5"-10" deep in the soil. The pupal period varies from 1-2 weeks. The adults emerge and start damaging the foliage and flowers. The maximum damage is done during March-April and the pest hibernates during winter.

Mix 1% parathion or 1% Isobenzan (Telodrin) or 5% heptachlor dust with the soil upto a depth of 6" before sowing or apply 10% carbaryl (Sevin) @ 8-10 Kg/ acre.

ROOT BUGS, *Stibaropus* Sp. (Cydanidas : Hemiptera) AND ROOT APHIDS, *Tetraneura* Sp. (Aphididae : Hemiptera) : The former are small dark brown insects emitting a buggy odour and the latter are small white or green apterious insects exceptionally inhabiting the soil and infesting the roots of jowar, napiar, paddy, ragi, sugarcane and wheat crops. Both the nymphs and adults suck the sap from the roots due to which the plants either remain stunted or start drying resulting in patchy growth of the crops due to chlorosis. The biology of these pests still await investigations.

Treat the soil with 10% B.H.C., before sowing or apply 5% aldrin or heptachlor or 10% carbaryl (Sevin) dust @ 8-10 Kg. per acre after sowing. RHINOCEROS BEETLES, *Oryctes rhinoceros* (Dynastidae : Coleoptera). It is the most serious pest of coconut. The adults damage the leaves and the inflorescence, preventing the production of nuts. They also cause death of the palms by attacking the growing points. The eggs are laid in manure and rubbish heaps as well as decaying vegetable matters, hatch out in about 10 days, feed on organic matter throughout the larval period which varies from 74-91 days, pupate in the soil or palm logs in cocoons and emerge as adults after fortnight. Single life cycle takes 3-6 months.

Spray 0.2% B.H.C. suspension on the manure heaps and decaying vegetable matter. Extract the adult beetles from the crowns by the help of hooked rods particularly meant for this purpose and fill the holes with a mixture of sand and 5% B.H.C. dust.

CRICKETS, *Brachytrypes portento*- and *Cryllotalpe* Sp. (Grylliade, Gryllotalpidse): They are nocturnal, sporadic, polyphagous feeders. Their presence in the field can be recognised by their shrilling noise and the presence of holes surrounded by heaps of the earth removed during the process of digging tunnels by them. Their activity dwindles during the winter and the rainy seasons. Eggs are laid in clusters in the soil in burrows after the rains have ceased, hatch in about a month. The nymphal period varies according to the agro-climatic conditions. Only one generation is completed in a year.

Flood the field if possible. Mix 1-1.5% dieldrin or 2% parathion or 5% heptachlor dust with the soil @ 10-12 Kg. per acre.

Urea Spraying on Cotton Crop

The Agriculture department of Central Government has drawn up a special scheme of holding urea spraying demonstrations on cotton crop at some selected centres in intensive agricultural areas throughout the country.

About 7,500 hectare area will be covered under the demonstration programme in different states. Rajasthan is the first state in the country where the experiment has shown encouraging results. The experiments made at the Regional Research Station Ganganagar, reveal that Urea Spray increases cotton yield by about 400 Kg. per hectare.

MIRACLE PEPPER VINE

A miracle pepper vine "Panniyur one" giving double the yield has been evolved by a Kerala scientist. Developed as a new hybrid vine at the Government Pepper Research Station in Taliparamba, the vine Starts giving yields from the second year of planting. It is proposed to supply at least 50,000 rooted cuttings of the vine to peper planters in the State within two years.

Cover Cropping—An Important Soil Conservation Measure

S. D. NARANG, P. S. Deol and V. K. Gupta
Department of Soils
Punjab Agricultural University Ludhiana

The term cover crop is defined as crops that are planted to cover and protect the soil when it is not protected by the regular crop.

To protect the soil from erosion and water runoff, a heavy living blanket of vegetation is needed. Close growing vegetation is effective in increasing water infiltration slowing run off and protectiag soil from erosion.

Cover crops infiuence soil, plant nutrients and water losses in several ways. First, there is a reduction of total ground rainfall, in direct proportion to the density, height and characters of vegetative growth, because the leaves and the stem act as organs of interceptiion and storage. A part of the moisture will remain on the plants as a film or as drops of water. Secondly the intensity of ground rainfall is decreased. The large drops are often shattered by vegetation into small drops which have lower impact effect on the soil.

Splash erosion is practically eliminated because the rain drop energy is expended on the vegetation and is not allowed to strike the bare surface of the earth and explode the soil. There is very little sealing of soil pores from minute soil particles in suspension, therefore the rate of water infiltration is maintained and run off decreases. Further more, freezing and thawing are less severe under cover, therefore the soil remains free from frost and to absorb moisture later in the fall. Fourthly, if the cover crop consists of grasses and legumes they will not only add organic materials and nitrogen, but they will help mobilize the various essential mineral elements for use by other plants.

A medow crop usually improves the stability and size of the soil aggregates. Fifth, a cover crop will help to absorb and conserve soluble plant nutrients which would otherwise be subjected to loss by leaching.

Practice of cover-cropping is mostly carried out in Kharif, because most of the cover crops are of Kharif season. In Rabi season crops are sown at shorter distance, so the crops act as cover cropping and protect the soil from erosion. In Kharif season, mash cow peas, groundnut, guara are the most successful cover crops. In row crops soybean sown in alternate rows proved economical and very useful as cover crop.

It has also been noticed that the residual from the previous crops remain on the surface as a mulch help to control erosion.

Although cover crops are only another cog in the wheel in maintenance of soil productivity, if it is possible to have them, they will support soil building particles and help to prevent further depletion of our soil resources.

A JOWAR WITH A PROMISE

Swarna. The name spells gold. From all accounts of its preformance that exactly this new high yielding Jowar is.

Recently released by the Central, Variety Release Committee for general cultivation, Swarna has performed well in 30 locations. spread in the States of Maharashtra Mysore, Andhra Pradesh, Madhya Pradesh, Madras, Orissa and Bihar.

As a summer crop, it yielded 3,850 kilograms per hectare as against 2,836 by the local variety—over 70 per cent increase. And in the Kharif its yield was 3,745 kilograms per hectare compared with 2,358 kilograms of the local variety, recording a 64 per eent increase over the local variety.

How does Swarna compare with the reigning champion CSH-1? They are almost equals. Swarna, however has a slight edge ever CSH-I, in that, being a 'high-bred' and not a 'hybrid' like CSH-I, the farmers need not get fresh seeds of this variety every year.

Swarna, however, will come to its own only in places where there is enough rainfall. It is therefore recommended, that this variety be grown as a kharif crop wherever the requirement is for a 110 day crop. As in irrigated crop, in summer in the south, sowing should be done in late January or early February.

The All-India Sorghum workshop held in May, 1968 recommends the following package of practices for this variety along CSH-1 and CSH-2.

The plants shonld be spread 12 centimeters apart in rows, the rows being spaced 45 centimeters apart.

Fertilizers are better applied on the basis of soil test. Roughly, the crop will need 100 to 120 kilograms nitrogen per hectare, applied in two equal doses one at the time of sowing and the other about 30 days afterwards. Sixty kilograms phosphoric acid should also be applied before sowing.

Entomologists at the workshop sorted out three major pests on Jowar. They are the shoot fly, stem borer and ear pests. For shoot fly, 10 per cent phorate granules at 1.3 gm/metre row, in furrows at the time of sewing should be applied. Or, two sprayings to the crop, one 3 to 5 days after the seeds are sprouted and the other a week after the first spray with the following chemicals will be effective; carbaryl (50% WP) 2 kg. or phosphamidon (100%) 125 C. C. or (30% E.C.) 250 C.C. in 450 to 500 litres of water per hectare.

Social Participation

S. P. SUPE

(Agriculture College, Nagpur)

The rural welfare agencies provide opportunities for the farmers for participation in social activities. In fact the effectiveness of a particular agency can be evaluated on the basis of the extent of participation made by the farmers in the activities carried out by that agency.

What is social participation ?

Social participation is the activity in which a person shares his experience with other members of the group beyond his immediate household. In this social process the individual identifies himself with a particular activity or a programme taken up by the group to reach a common goal. The participation may vary from mere passive attendance at meeting to intense interest involving systematic overt behaviour such as carrying on a discussion or planning a meeting. Numerous conditions and circumstances affect the process of participation, but if it is voluntary then it tends to create favourable attitude toward the programme.

The social participation can be broadly classified into three categories, namely, formal, informal and semiformal. Formal participation is the part taken in organizational groups and includes not only attendance at meetings but also membership maintained, financial contributions made, committee work done and offices held. In the second category of informal participation, social and recreational activities such as visiting people and talking in the primary groups can be included. In addition to these two major areas there is another called semiformal participation which can be described in terms of attendance at public events such as festivals, inaugurations, commencements and parades.

Why people participate ?

It is interesting to know the factors which make the people join groups and come in social contact. The human being have gregarious habit which brings them together. However, experiments conducted in this field are naturally restricted to voluntary participation of the individuals who have choice to join the groups or to act alternatively. A deeper probe shows that individuals join groups as they are interested in the objectives and activities of the groups. Secondiy, to seek the company of their friends who are members of the groups. Thirdly, the good working and friendly relations puts a good ideal and attracts other persons towards the group. Finally, the persons with common culture, common values and purposes from into groups to promote their common values and purposes.

Advantages of participation :

There are evidences which show that social participation brings a change in the individual. In the physical presense of other individuals work more. The individual performance increases irrespective of lowest performer or the highest performer. The leaders emerge out of this situation and they guide their followers toward a common goal decided by the group. It is not necessary that the highest performer will be a leader. Usually the average performer who sticks to the norms of the group becomes the leader.

The participation of an individual may bring about change in the group behaviour. But sometimes the individual may get changed due to group influence. The group influence acts in changing his ideas, attitudes and sentiments. As the individual participates more in the activities and discussions of the group his loyalty towards the group increases. It may be due to more interaction with the group members. This interaction results in more friendship ties and realization of the objectives of the group. After participation if the individual finds that the role played by him in the group is recognised and honoured in the group then he takes a keen interest in working for the group.

How to increase participation ?

It will be clear from the above diccussion that the main job of the change agent is to involve more people in the social welfare activities. The recognition and acceptance of the activity will largely depend on the extent to which the people participate in that activity.

The factors which determine the extent of participation can be broadly divided in two categories. One set of factors is called static factors while the other set is named as dynamic factors. The static factors as the name indicates are those which cannot be changed easily by the members of the group or by the change agent who would work with the group. Some of these factors are, age, formal education, caste etc. While forming new groups for a particular cause advantage of these static factors can be taken by the change agent.

The activities of the groups which are already in existence can be accelerated using the dynamic factors. These factors can be changed by planned action of the group members and change agents. The understanding of the purpose of the association, identification with the association, satisfaction with it and feeling of responsibility to it, are some of the dynamic factors. If the group members understand these factors then participation patterns of the groups can be changed without changing the membership of the groups,

For increasing the participation of the clientele, the change agent should analyse the situation in order to locate the static and dynamic factors responsible for participation. This information would help him in organizing new associations as well as renovating old associations. The dynamic factors would help in developing new techniques and programmes that would appeal to the needs and interests of the participants. By and large the programmes organized by the change agent should be properly integrated so as to offer maximum opportunities for social participation to the clientele.

TRAINED FARMERS ARE DIFFERENT

In Rajasthan, trained farmers have started to make their mark in many fields of agricultural development.

The farmers, now nearly 3,000 are trained at the Udaipur University under the Farmers Training and Education Programme.

One of the benefits of this training is reflected in a seed production project at Balgaon, a village six miles away from Udaipur. Here a 60-acre land belonging to the University was turned over to a group of 30 farmers for producing improved seeds of maize and wheat. They were trained in the techniques of seed production at the University.

Before the seed production programme started, the 60-acre plot could hardly be called a farm. A portion of it had an unremunerative orchard of pomegranate. The land was levelled and laid out with provision for irrigation.

To begin with they grew maize and wheat for seed in only 8 acres in 1966. Subsequently, they went on increaing the area every year and last year they had 40 acres under hybrid maize in *kharif* and 60 acres under hybrid wheat in *rabi*. The produce from this land was worth Rs. 1.8 lakhs.

The trained famers then started working on this land and they have made it into a flourishing seed farm.

They are producing seeds of the hybrid maize, *Ganga-3*, and the wheat varieties, *Kalyan Sona* and *S-227*. The entire quantity of seed is bought by the State Agricultural Department.

The impact of this farm where farmers themselves work and produce the best quality seed is felt in all the neighbouring areas.

Said Vardha and Hema who belong to the group of trained farmers producing seed, "Here, we are all small farmers, owning less than two acres each. After the training and experience gained on this farm we are much better off on our farms also."

Now farmers in Balgaon village who are untouched by the surge of the improved cultivation are not many.

The farmers training is not confined to men only. It reaches women too.

"Women in our country work more than men on the farm. So, are they not entitled to training? asks Durgabai, a woman trainee of the same village.

Durgabai and her sprightly young daughter, Hemlata, underwent the training at the University and as a result they have organised their 4-acre farm into a very profitable one in the area.

"We engage male labour only to plough the land. Almost all the other jobs, we do ourselves". There was that touch of pride in Hemlata's voice when she said it.

They are now practising a sound crop rotation and for each crop, they use the best seed available. The seed they prefer for maize is *Ganga-3*, for wheat S-227 and for peas *Bonvilla*. They have also a piece of land for lucerne for fodder, and their summer vegetables find a good market in the city.

"All said, we are now making three to four times more than what we used to get from this farm a few years ago", said the mother, Durgabai.

Durgabai is the leader of the local 'Charcha Mandal', a discussion group of farm women. She keeps herself very busy on her farm giving practical tips to fellow farm women.

Another village where both men and women are benefited from training is Sanwar in the Rajsamant Panchayat Samity area. Here 32 farmers have not only taken to the high-yielding varieties but also started growing cotton as a profitable cash crop. The women had special training in compost production and storage of grains. Each of the 23 women now has a couple of *pucca* compost pits which will help in manuring high-yielding varieties. To avoid loss in stored-grain, they now store them in bins.

The Farmers' Training and Education programme is a continuing programme and many more farmers and farm women will be getting benefit out of it in the days to come.

Portable Plastic Warehouse

Small Kenyan farmers have increased their grain supplies as much as one third to one half through adoption of new improved methods of grain storage. This is an inflated plastic warehouse built in England for Kenyan farmers. It is portable fumigatable and moisture proof and houses 5 thousand tons of bagged maize.

Aphid Trap

The Central Potato Research Station, Patna has developed an 'Ahid Trap' to warn potato growers of invasion of aphids. The trap, with adhersive paint on it, is hung up high in the air to detect the arrival of aphids during the late December and early January when the crop is ripening. When the aphids are trapped a danger signal is sent to all potato growers who then take appropriate action.

White Gold of the USSR

By Gannady Galkin

It is no secret that fabrics woven from the long, silky staple cotton are essential for the textile, aviation, automobile and electrical engineering industries throughout the world. Exporters of this raw material found it to be a gold mine.

Probably, that was when people started calling cotton 'white gold'. There are several qualities that fine-staple cotton must have. The two most important are the length of the fibre and its tensile strength. This sort of cotton began to be acclimatised in the hot basin of the Nile during the last century. It must have at least two hundred frost-free days per year for its growth.

This kind of cotton was introduced into Russia during the 'seventies of last ceutury but with no success. The yield was no more than six centners per hectare. Experiments for the developments of plants suitable for Central Asia were begun. A complete change in the Egyptian sorts was required and suitable agricultural techniques had to be evolved.

Academician Maksimenke first became acquainted with cotton growers in the early days of collectivisation. Collective farms were just being organised.

Difficult Process

Inter-species hybridisation is a very difficult process by its very nature. For instance, one must take the best progressive qualities of the finest kinds of cotton and combine them into a new plant. In 1924 the British scientist S. Harland stated at a conference on the subject of cotton selection, that it was much the same as taking the parts from two different makes of automobiles and trying to assemble out of them a new type of car that would have the qualities of both the original cars.

As a result of the first years of testing Egyptian cotton it was found that by selecting individual plants from each year's growth, a strain could be developed that would mature ten days earlier than the original plants from which they were selected. This was a substantial gain. In this manner improved strains of the Pima and Maaead types of Egyptian cotton were evolved. However, they did not satisfy the needs of cotton agriculture and the textile industry. The Egyptian kinds needed to be completely changed to adapt them to Central Asian conditions.

The Scientists at the farm started practically from scratch. Neverthless, within a few years new strains of improved Egyptian cotton began to appear on the fields of the collective farms and later, the first Soviet fine-staple cotton was introduced.

Unfortunately it is impossible to create the ideal plant. Maksi menke's first sort of cotton had many good qualities, but at the same time had one serious defect ; it had no immunity against fusarium wilt. In other words this is very much like throm bophlebitis. There is no remedy for it.

A new series of experimcnts was started. The test field was deliberately infected with wilt. This is called the method of provocation. The greater part of the plants succumb to the disease. The most resistant survive. Experiments with these survivers continued for several years. In this way Maksimenke developed a new sort of disease resistant cotton, the 9073-I and after severe field tests, it was recommended for wide cultivation.

The strain of cotton that the academician likes most is his latest, the 8763-I. It gives the highest crop of high quality fibre. The greater part of the land in cotton-growing republics of the USSR are planted with this sort of cotton.

News from the State Samaj

BIHAR

Begusarai Krishak Samaj Passes Resolution.

Members of Begusari Krishak Samaj, District Monghyr held a meeting on 31st August, 1969 which was largely attended by progressive farmers of the district. The text of resolutions adopted by the meeting is given as under :—

It is unjustified to levey agricultural income tax on small farmers with holdings upto 30 acres. The State Government be requested to review Tax proposals and make definite provision that notices for realising Agricultural Wealth Tax may be issued to those farmers only whose holdings are more than 30 acres and thus save the small farmers from being unnecessarily harrassed at the hands of revenue officers.

The meeting resented the State Government proposal for 50 per cent increase in land revenue. The participants were of view that this action is quite contrary to the proposals of former democratic State Governments which wanted legislation for abolishing land revenue levied on farmers. 50 per cent increase in land revenue will bar the agricultural progress hence adequate measures be taken for its ratification.

In view of the excessive rains and havoc caused by reeent floods in northern parts of Monghyr district, it was resolved that the government be approached to stop realisation of land revenue ; loans, taqavi, etc., from the farmers of affected areas.

MYSORE

Monthly meeting of farmers

Mysore Pradesh Krishak Samaj has decided to have a farmers' meeting at its State Office on 1st Monday of every month in which day-to-day problems of farmers will be discussed and necessary recommendation will be made to Government to redress genuine grievances of the farmers.

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