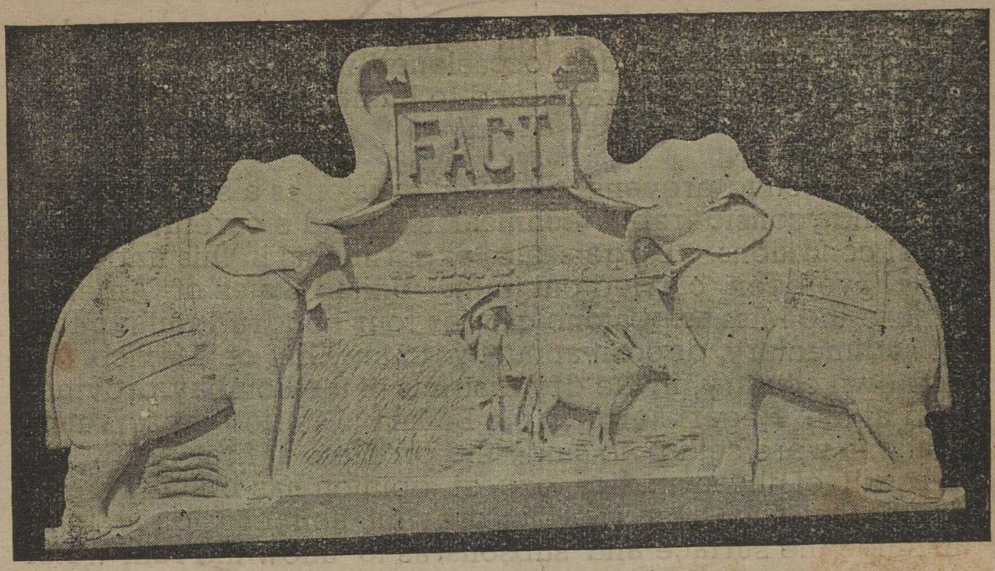

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EDITORIAL.

SOIL EROSION

CONSERVATION of the surface soil is of paramount importance not only to the agriculturist but to the Public at large. The problem is so vital that any emphasis laid on it will never be too much. In many parts of India generally, and particularly in the tract of land lying to the west of the Ghats, the incidence of monsoon rains is heavy and profuse. This causes a good deal of surface soil to be washed down streams and rivers, and ultimately finds its way into the sea, year by year.

From the remote past, man has not been very careful in the proper maintenance and preservation of land, which yields him his sustenance. Our hills and hill slopes have been periodically denuded of trees, shrubs and other vegetation, which gave protective clothing to the soil and the subsoil beneath it. As a direct consequence, rain water, un-checked and unheeded, has been carrying away by sheet and gully erosion, the fine and rich crust of earth

indispensable for good cultivation. This has resulted in floods, caused landslides, occasioned wholesale destruction to crops, cultivable areas, and to human enterprise generally.

Effective prevention of Soil erosion is a subject which demands considerable technical skill and a careful study of local conditions. Large-scale experiments in this important line have been carried out in the United States of America where the Mississipi alone carries four hundred million tons of sedimentary deposit annually to the Gulf of Mexico. In our own country, in the dry districts of the Bombay province and at the Hagari Farm in the Bellary District, observation stations were set up to study the problem at first hand. As a result of these studies, expert opinion has been put forward that the best way to prevent soil erosion is to so arrange the surface and subsoils, as to allow the rain-water to percolate down into the earth, and remain there. For this purpose the soil of a particular catchment area has to be prepared machanically and biologically to absorb all the water that falls over the surface.

The devices recommended for effecting this, consist chiefly in trenching, terracing and edging operations as also in the process known as contour bunding. Terracing and edging are adaptable for undulating ground like hill slopes, while contour bunding can be adopted wherever there is a large tract of even ground either plain or gently sloping. It is of interest to us to know that in the ceded Districts of the Madras Province, where the land is dry and even, the Rayalaseema Development Board has taken up the work of contour bunding as one of its main improvement schemes. The process consists in selecting one complete catchment area and erecting equally spaced contour bunds all along the tract. The entire area will be cut up into belts of horizontal width of a convenient size to make cultivation fully economical. The bunds thus put up will hold the rain water in between, and will prevent its draining away. Thus every inch of the ground gets the benefit of the rain either by percolation or by seepage.

Where the ground is undulating as in the Malabar Coast and ends in a slope to the sea, the problem of soil conservation requires more careful handling. Terracing and edging can only be done over regular hill slopes, and these require constant vigilance and careful tending for proper functioning. An effective alternative is allowing shrubs, thickets and other foliage, to grow and spread their

roots firmly into the soil. These will act as a break to rushing water currents and help seepage. When more rainwater percolates into the soil there will be less to drain off and cause erosion. For this the soil must be kept in a porous condition by natural means as well as by artificial methods. Stubble of grass, decaying matter like leaf humus etc., when lying spread over the surface soil, will, to a great extent help in arresting erosion due to rain water.

Water that pours down ravines and gullies and eventually gets into rivers should, as far as possible, be allowed to flow along the riverbeds themselves. For this, banks on the sides of rivers should be maintained correctly with convenient outlets such as channels to places on a lower level than these river beds. This will avoid or at least minimise floods during the wet season, besides irrigating the fields on the sides of the channels. Cultivation of grasses and sedges on either side, wherever the river banks are low, will also help to stem the force of floods and lessen the chances of soil erosion.

Unremitting use of grazing grounds and the more or less complete despoliation of grasslands and moors have occasioned another kind of erosion not due to water but to wind. When there is no vegetation of any kind to hinder it, the wind carries away surface soil in the form of fine dust and deposits it in unwanted places. This menace can only be prevented by giving cover protection to the soil to hold the sandy matter in place, by means of grasses and the like surface growth.

Soil erosion is a very serious menace to the safety and prosperity of the land. It is high time that people in general, and cultivators in particular, are made conscious of its grave consequences. A good deal of propaganda has to be done in this direction and the importance of the problem warrants systematic and sustained efforts. The average ryot should be carefully educated in the art of conservation of the soil, and all the methods which science and a knowledge of natural tendencies could muster, should be made easily available to him. Governments and local bodies should also take up the problem in right earnest and make it a part of their reconstruction programmes. For, timely measures and quick action are the only way to prevent all the life-giving elements of our land from being washed away little by little, step by step, into the Sea.

Editorial Board.

Superphosphate Manufacture

By

S. Nallaperumal B. A., B. Sc. (Eng): M. I. S. E; A. A. I. E. E; A. M. I. I. Chem E.

SUPERPHOSPHATE is made by causing sulphuric acid to react with powdered rock phosphate in about equal proportion by weight. The product resulting from the acidulation is a mixture containing monocalcium phosphate and $CaSO_4$ and usually contains about 18 to 20% available phosphoric acid (P_2O_5)

Annually about 2 crores of tons of superphosphate are made and it forms the base for fertiliser mixtures. Fertiliser manufacture is becoming more and more a modern job of chemical engineering enterprise. It consumes the largest quantity of chemicals of any division of process industry and requires close attention to good engineering and sound economic principles. Successful manufacture of acid or superphosphate is necessarily a large-scale business. The small maker will be at a great economic disadvantage. The capacity required for material handling and supervision will be great.

Superphosphate industry is dividing itself into two parts, one definitely chemical engineering in nature and the other primarily as a marketing industry in agriculture. We shall consider only the first part. Since the manufacture of superphosphate consumes much sulphuric acid, the making of superphosphate is associated with sulphuric acid manufacture. In fact economic considerations make it necessary that a large superphosphate maker is also a sulphuric acid manufacturer. However the acid maker must dispose of acid for other purposes as well otherwise he will be losing the opportunity for profitable acid making.

A description of the superphosphate plant of the Fertilisers & Chemicals, Travancore Ltd., Alwaye, will afford an opportunity to interpret the new lines which will be of interest to many firms and chemical engineers connected with fertilizer manufacture.

Superphosphate Plant.

Phosphate rock from Morocco has a total phosphoric acid content of 34.4% equivalent to 76/77% bone phosphate of lime. It is shipped from the Port of Casablanca and is received in shiploads of 5000 to 6000 tons at Cochin. At Cochin delivery is taken midstream, i.e. the rock is unloaded in barges, the barges holding about 40 tons each. From Cochin the barges take the rock to our factory site, a distance of about 19 miles.

From the barges the rock is unloaded by means of Cranes and some manual labour. The rock phosphate godown and superphosphate plant are situated a few yards from the river bank The rock phosphate is pushed into the large godown (250' × 50')by means of a bull dozer.

The rock phosphate is received in powder form. The Moroccan rock is soft and easily powderable when

compared with Florida rock phosphate.

The rock is fed into the hopper at the boot of a bucket elevator by means of a Payloader. The Payloader is a small petrol driven mobile unit equipped with a ¼ ton capacity moveable bucket in front. It is useful not only to transfer rock phosphate from storage to elevator boot but also superphosphate from the pile to any place desired on the floor in the superphosphate plant building.

The rock that is supplied to the feed hopper at the elevator boot is lifted by the buckets and falls into a bin just above the feed of the Raymond Mill. There is a feed control plate in the rock bin. This control plate is wired so that it turns on a light when the bin is nearly full. The material in the feed hopper is automatically fed into the Raymond mill by the Raymond feeder. After the material is ground in the Raymond mill it is lifted into the cyclone from which it is deposited into the dust silo. This silo is a simple, cylindrical steel vessal capable of holding 40 tons of rock phosphate powder. At the bottom of the silo there is a 9" recovery screw reclaiming dust from the silo and carrying it to a dust elevator. This dust elevator conveys the material to another screw conveyor and thence to a small storage hopper equipped with a mercoid level switch which stops the flow of material at a desired level. Dust is drawn from the storage hopper at this point into a carefully calibrated weighting hopper and the desired weight of rock is held in this hopper for mixing.

Acid is drawn from the 75 ton plant and is stored in a 40 ton steel storage tank. This acid is 98% strong and it has to be diluted to 60% strength. This is done in 2 lead-lined tanks of timber each measuring 10' × 5' × 5'. For taking away the heat produced when acid and water are mixed each tank is provided with a set of 6 cooling coils of 1½" lead pipe. Proper mixing is achieved by means of compressed air at 10 lbs. pressure. The optimum temperature of the acid for good superphosphate preparation is 120°F. and strength 110°Tw. Diluted acid is pumped directly to the weighing tank from the dilution tanks by means of a worthite pump. The pump motor is wired in such a way that the mercoid on the beam of a balance cuts off the motor when the desired weight is attained in the weighing tank.

The charge per mix is composed of ½ ton rock powder and nearly equal weight of acid 56°Be and 120°F. The dust and acid are mixed intimately in a 2 Ton Pratt type mixer. The tricalcium phosphate is converted to monocalcium posphate. The soupy mixture is stirred for 1 minute and is dumped into a den. Much of the fluoride in the rock reacts with sulphuric acid to form HF which reacts with silicate forming SiF_4.

The mixer consists of a revolving C. I. pan of about 7' dia. with stationary C. I. cover. Intimate mixing is assured by 2 stirrers each with 4 plows of C. I., which revolve inside the pan in opposite directions. There is a scraper blade which is kept at the top of the pan during

mixing and a heavy plug valve in the centre of the pan which remains closed during mixing. These are operated simultaneously by a single control lever which lifts up the plug while the scraper is lowered to discharge the mix. The plug and scraper automatically go to their original position on releasing the lever on complete discharge.

The den proper is composed of a car moving on rail track. The size of the den is about 14 ft. × 6 ft. × 8 ft. The bottom and back side of the den are of R. C. The sides and front door are of steel frames and fitted with 2" layers of teak planks ship-lapped. The front and side doors are detatchable. The capacity of the den is 16 tons, i.e. one hour's mixing product. A setting period of 30 minutes is given after which the screw jacks holding the side doors are released and the front door raised by a hoist. The den at this point is ready to move forward into revolving cutter knives and discharge into a bucket elevator. This carries the material to the belt conveyors which in turn convey it to the superphosphate pile.

During mixing Stet gases evolve from the mixer and den. These are drawn of by means of a tarcoated blower thro' a free tower of wood, 16' in height and 8' in dia. The tower is fed with a series of 14 sprays of the Schutte & Koerting type. The gases are scrubbed in the water spray and the residual gases find their way out by a vent stack 3' dia. and 45' high. No effort is made to recover the fluorine.

Enough ventilation and aeration are necessary for the curing and conditioning of superphosphate. Aeration is achieved to some extent by the super falling thro' a height of a few feet from the conveyor to the curing pile.

Superphosphate is allowed to remain in the pile till it analyses 18% water-soluble P2O5. Then it is bagged and despatched. The average composition of superphosphate made in FACT is W. S. P. A. 175%; Moisture. 10.0%; Free acid 3.5%.

Superphosphate bagging & shipping:

The superphosphate which has been allowed to remain in the pile for about a fortnight is brought by means of the payloader to the bagging and shipping unit.

The bagging unit consists of a feeder hopper at the elevator, boot, a mill for breaking lumps, an elevator, a screen for sizing super 10 mesh per inch, a tailing knife for breaking super which does not pass thro' the sieve and a mixer which may or may not be used. Underneath the mixer are placed the sacking hopper and eact O' scales.

Bagging is done at the rate of 10 tons per hour. In the bagging unit there is provision for making ammoniated superphosphate by adding to super phosphate ammonia liquor 25% in a ¼ ton mixing drum. The ammoniated superphosphate contains 2-2½% NH3.

കാഫലം പ്രധാനമായ എല്ലാ കൃഷികൾക്കും അത്യന്തം ഉപയോഗമുള്ള ഒരു വളമാണ് സൂപ്പർഫോസ്ഫേറസ്. ഇതു്, റോക്ക് ഫോസ്ഫേറസ് എന്നാ ദ്രവ്യത്തിൽ സൾഫ്യൂറിക്ക് ആസിഡിന്റെ പ്രയോഗത്താൽ നിർമ്മിക്കപ്പെടുന്നു. സൂപ്പർഫോസ്ഫേറസ് നിർമ്മാണത്തിൽ ആവശ്യമായ യന്ത്രസാമഗ്രികളും പ്രയോഗവിധങ്ങളും മുതലായവയെ വിവരിച്ചുകൊണ്ടുള്ള ഒരു ലേഖനമാണിതു്. എഫ്. എ. സി. ഒ. യിൽ ഈ വളം ഉണ്ടാക്കുന്ന ശാഖയുടെ മേൽനോട്ടം വഹിക്കുന്ന ശ്രീ. എസ്സ്. നല്ലപെരുമാളാണ് ലേഖകൻ.

ECONOMIC EFFICIENCY

By

A. V. Mathew, B. A., B. L.

MAN'S attempt to create a better society rests upon the assumption of several economic principles. Historically it has been proved over and over again that in every society there must be economic activities. The importance of economics is best appreciated when it is seen against the long perspective of the history of the world. Economics, which may be left to speak for itself, is eternally immutable and indestructible and forms a single harmonious system, accounting in several ways for the records of history and observed phenomena and displaying much adaptability. The vision of economics is various or multiple in its unity. Economic activities are interdependent and inseparably united in social experiences. The laws of economics supply the skeleton or framework within which the test of coherence applies.

A revision of the food policy of the world has now become a necessity. This fact places upon all men a tremendous responsibility. The lack of our real awareness to the world shortage of food has proved one of the most powerful agencies in creating a process of economic disintegration, several awkward gaps in many of our economic theories, and aberrations of individuals and nations.

An integrated national policy for the solution of India's food problems must be worked out and put into effect. The only way in which our food problem can be solved is by having recourse to more production of foodgrains and by avoiding unwise tendency to drift into a policy of importing food rather than growing it more abundantly than at present. Indian agriculture has still to develop beyond its primitive methods and calls for considerable expansion of scientific research and development. The fundamental issues relating to our "Grow More Food Campaign", which are so much a part of our national programme, still remain unanswered, exposing our lethargy and inertia which are incompatible with our requirements for security in the realm of economic life. The drive for growing more food is an application of the principle of agricultural efficiency which we Indians recognise as assential or as capable of being practised with advantage, but which we have hitherto failed to carry out, with the result that such a failure has set limits to our economic independence and to our ability to adjust ourselves to changing economic conditions with due regard to the signs of the times and the tendencies of the present.

In a book named Science and the Nation, the authors say: "The broad aim of food technology should be to ensure that food reaching the consumer is wholesome, palatable and of maximum nutritive value. Techniques of food processing, worked out in the late 19th and early

20th centuries, such as refrigeration, canning, refining, arose from the need for methods of preservation and utilisation adaptable to the requirements of modern society.

When efficiently applied they give food which is wholesome and palatable; but they were not consciously designed as methods which would also conserve the full nutritive value of food-stuffs. Indeed this was then impossible, as the essential basis of fundamental nutritional and biochemical knowledge was lacking. Thus, in so far as these methods did preserve nutritional quality, it was fortuitous rather than by conscious design. The perspective has now been transformed by the striking advances which have been and are being made in biochemical, biophysical and nutritional research, and by the possibilities made available by progress in physics and engineering. These developments would appear to open up fruitful avenues for post-war research in the food industry. The essential aim should be to modify and adapt the older techniques and to apply new ones in the light of the advances being made in fundamental biological knowledge."

The magnitude of the force of work upon men needs little comment. Mankind has never been able to escape the influence of work upon its life. The universal fact about work is that it provides the social direction in which the moral virtues can be discerned and developed, giving at the same time opportunities to men to earn their daily bread and to obtain satisfaction for their minds.

In our time labour, which is no longer insulated from the ferment that runs through the rest of the world, seems to take on a new value. No doubt, the prospects of labour have much improved in harmony with the development of the democratic doctrines of individual freedom and the worth of human personality. Labour thinks that a new day has dawned upon it pregnant with infinite potentialities and possibilities. Capital cannot be blind to the values that inhere in labour and should never follow fallacious theories and practices which oppose the elementary rights of labour or the rights of capital, but must relax exaggerated policies of self interest, profit motive, and monopoly. There is, very often, a good purpose in the methods adopted by labour which shows itself plainly in their results. Sheer prejudice blinds many capitalists to the realities of the problems arising out of the disputes between capital and labour, and diverts attention from crucial issues that require to be solved. There should not be any quarrel with the pursuits of labour's activities so far as they may be legitimately carried out.

At the same time it is an erroneous policy on the part of labour to be perpetually in the habit of using opprobrious terms to designate the capitalist tenets, however shallow and retrograde labour believes those to be. It is a mistake to condemn all who call themselves capitalists, and a folly to try to eliminate capitalism from the economic sphere or to be intent on breaking up all capitalist enterprises without assuming responsibility for the consequ-

ences. The diognosis of the evils of capitalism by labour is often found to be inadequate. The pursuit of opposition tactics, non-co-operation and strikes on the part of labour against capital is a terrible stumbling block to economic progress.

In the words of G. A. Studdert Kennedy: "It sounds very well in a propaganda speech to thunder against production for profit. Many prophets have lived by denouncing profits, but theirs is very cheap and shallow prophecy. It is based upon an altogether insufficient analysis of the source and functions of 'private profit' arising out of an uncritical acceptance of the Labour Theory of Value. Private Profit has a threefold function. It acts:—
1) as an incentive to production, 2) as a measure of the value of production, 3) as the source of a provision for future production. In order to abolish private property it is necessary to discover another equally powerful incentive to production. And whether that incentive can be discovered and made operative or not depends upon human nature, upon what it now is, and what it is capable of becoming. If men are of such a nature that they must always have either the fear of personal poverty or the hope of personal gain as a direct incentive to induce them not merely to work but to do their best, then abolition of private profit is impossible unless we are prepared either to compel men by physical force and fear to do their best, which is probably impossible, or to be content with a lower standard of life, which is obviously undesirable. From the point of view of incentive then, private profit is not lightly or easily to be dispensed with.....Moreover if private profit is to be abolished it is necessary to discover an alternative method of estimating the value of things produced, and thus ascertaining how far Industry is performing its basic function of supplying people with what they want. At present this estimate of value is arrived at roughly by the haggling of the Market in the workings of which the hope of private profit is a dominant motive."

The world has undergone economic changes in the past and is sure to undergo such changes in the future. Any attempt to state adequately the methods by which economic changes happened in the past would involve a lengthy history of the world. While economic injustice in very truth is a foe to the human race, morality gives incentive, impetus, force and cogency to economic justice. All economic activities must realize in understanding and experience the primacy and richness of moral force. The final paradoxes involved in economic injustice are always in peril of disintegration. Indian culture still has the capacity to redeem modern India and to help her to play a great part in creating a perfectly consistent and rational economic order by satisfactory regulation of all economic activities.

ശ്രീ. ഏ. വി. മാത്യുവിന്റെ ചിന്താഫലമായ മറെറാരു ലേഖനമാണിതു്. "സാമ്പത്തികമായ കാര്യക്ഷമത" കൈവരുത്തുവാനുള്ള ആവശ്യകതയെ ഈ ലേഖനം ചൂണ്ടികാട്ടുന്നു. "ജീവിതചര്യയിൽ പ്രയത്നത്തിന്റെ സ്വാധീനം ചെലുത്തലിൽനിന്നു വിമുക്തരാവാൻ മനുഷ്യർക്കു് ഇതേവരെയ്ക്കും സാധിച്ചിട്ടില്ല" എന്നിങ്ങനെയുള്ള പരമാർത്ഥങ്ങൾ ഉല്ഘരിച്ചു് ശ്രീ. മാത്യു സാമ്പത്തികഭദ്രത നമ്മുടെ സുസ്ഥിതിക്കും, നിലനില്പിനുതന്നെയും എത്രമാത്രം അനുപേക്ഷണീയമെന്നു വിശദമാക്കുന്നു.

SCIENTIFIC FARMING

(How to Produce More and Better Crops)

SCIENTIFIC research on crop production, which is one of the primary functions of the Indian Agricultural Research Institute, New Delhi, has been carried on in the Institute for the last 44 years since its establishment in Pusa in Bihar in 1905. But so vast is the field to be covered that this research, although it has already produced valuable results, has touched only the fringe of the many problems of agriculture in India.

One of the outstanding achievements of the Institute is the evolution of some varieties of wheat which have earned world re-nown. The best of these is N. P. 4 which was awarded first prizes for grain quality in several international exhibitions in Australia, America and Africa. This wheat is also the parent of some of the important wheats in Australia. It has high grain quality and in comparative test of world wheats in America, N. P. 4 was found to have the highest protein content. When Dr. B. P. Pal, Head of the Botany Division of the Institute, who has done considerable research on improved varieties of wheat, visited Australia recently he found that N. P. 4 was extensively used in Australia; in Queensland as much as 1/6 of the entire wheat acreage was cultivated with it some years ago. He also found that new wheat varieties in Queensland like PUORA were of 'Pusa' parentage, the first syllable of the name being derived from the word 'Pusa'.

Among other important varieties of wheat evolved at this institute are N. P. 52, N. P. 165 & N. P. 125. N. P. 52 is resistant to black rust and during the black rust epidemic in C. P. in the winter of 1946-47 there was a great demand for this seed. It is particularly fancied in Bihar where the farmers call it 'Collegia Wheat' presumably reminiscent of the days when the Agricultural Research Institute was located at Pusa in Bihar. N. P. 165 is a very high yielding grain; over 40 mds. per acre have been obtained in experimental farms in the Institute and even higher yields have been reported from the Lyallpur District of the Punjab.

High yielding strains of barley producing as much as 56 mds. of grains per acre have also been evolved at the Institute and nucleus seeds have been supplied to the Provincial Governments.

Potato Culture.

A novel method of potato culture by planting only the sprouts of a seed potato has been successfully evolved at the Institute. Normally, seed potatoes by themselves or the cuttings containing the eyes are used as seeds. Experiments at the Institute have shown that sprouts scooped out of a seed potato can be planted with success. This ensures quicker seed multiplication of new varieties at the experimental stations. From the Potato Research Institute at Simla sprouts have been sent by air as far away as Calcutta

without any apparent adverse effect on their reproductive capacity. In this process, 25 to 40 potato seedlings can be developed out of one seed potato.

Summer Tomatoes.

The Institute has grown successfully summer tomatoes and is now breeding them on a commercial scale. The tomato in India is primarily a winter crop. The Institute procured some wild tomato plants from South America which were found to stand up to heat. These tomatoes are very small in size but after crossing them with the Indian variety bigger samples have been obtained and examination has revealed that their vitamin content is higher than the ordinary tomato and they have also better flavour.

Enemies of Crops.

For maximum results in agriculture man has to guard against a large number of adverse factors, besides unfavourable weather which in India, particularly, is the greatest handicap. But, in the soil itself as well as in the plants and the atmosphere, insect and disease germs flourish, which if not controlled, work havoc in the biological system of the plants. The wheat rust epidemic of 1946-47, it may be recalled, caused a loss of crops valued at Rs. 60 crores.

Among the various plant diseases which are being studied at the Institute are rusts, smuts, cotton root rot and gram wilt. In the Museum of the Mycological Division of the Institute, 700 cultures of fungi are maintained. These cultures are supplied to different institutions and scientific investigators all over the world for research. The Herbarium of the Institute which is probably unequalled in the East contains more than 17,000 specimens.

Rust is a serious menace to wheat and in India the position is particularly unfortunate as all the three kinds of rust, namely, black, brown and yellow occur whereas in other countries usually only one type of rust is prevalent. Considerable research work has been done at the Institute and varieties of wheat resistant to particular type of rust have been evolved.

Virus Diseases of Potato.

Virus diseases of potatoes which are responsible for considerable loss to our potato crop have been investigated and comparatively disease-free seeds have been produced in large quantity and supplied to Provincial Governments for further multiplication. Though potato is the most extensively cultivated of all vegetables in India, still the acreage and the per capita consumption are very low, our cultivation being not more than 1 per cent of the world acreage. The average production is also very small. On an average about 109 mds. of potatoes per acre are produced in India as against 224 mds. in Belgium and 183 mds. in the United Kingdom. This poor yield is mainly due to virus-affected seeds which reduce productivity.

Cultural Experiments.

The Mycology Division has evolved a schedule of sugarcane

cultivation which by changing the time of sowing and other allied operations can reduce the incidence of sugarcane smut and red-rot considerably.

A very important discovery was the method of eliminating cotton root-rot by a system of mixed cropping. Experiments at the Institute showed that cotton root-rot in the Punjab could be tackled sucessfully by mixed cropping with *moth* (a particular kind of pulse) and by adjusting the sowing time. The *moth* reduces the temperature of the field by about 15 degrees.

This method was recommended to the Government of the Punjab who adopted it preventing an annual loss of about 30 lakhs of rupees, which occurred due to this disease alone.

Insect Pests.

Pests and insects which attack crops have caused worry and loss to cultivators throughout the world. Besides producing insecticides and affecting improvements on some of the well-known insect-killers, the Institute undertakes research on the production of parasites and predators which are natural enemies of some of the insect pests. The insect museum of the Institute—the National Pusa Insect Collection as it is proudly called — contains about 20,000 species of insects and more than a lakh of specimens and is probably one of the best collections kept anywhere in the East.

How parasite control of pests can be effective has been exemplified in the case of the sugarcane. It has been estimated that sugarcane stem borer causes a loss of not less than 7·5 per cent of the entire sugarcane production in the country. In the parasite laboratory of the Institute egg parasites which are capable of killing the stem borer are being produced in millions in specially designed cabinets, at a very low cost of Rs. 2/- for treating one acre per season.

'ശാസ്ത്രീയമായ കൃഷിചെയ്യൽ' എന്നു് ഈ ലേഖനത്തിൽ. ന്യൂ ഡൽഹിയിലെ ഇൻഡ്യൻ കൃഷിഗവേഷണസ്ഥാപനക്കാരുടെ പരിശ്രമഫലമായി ഉരുളക്കിഴങ്ങു്, തക്കാളിപ്പുഴം തുടങ്ങിയ പല കൃഷികളും എങ്ങനെ അഭിവൃദ്ധിപ്പെടുത്താമെന്നും, അവയെ ബാധിക്കുന്ന ചില രോഗങ്ങൾക്കു് എങ്ങനെ നിവാരണം വരുത്താമെന്നും ചൂണ്ടിക്കാണിക്കപ്പെട്ടിരിക്കുന്നു. പരുത്തിച്ചെടിയുടെ വേരുകൾ അഴുകുന്നതിനു പ്രതിവിധി കണ്ടുപിടിച്ചതു് പ്രസ്തുത സ്ഥാപനത്തിന്റെ നേട്ടങ്ങളിൽ ഒന്നാണു്. ലോകപ്രസിദ്ധി ഉണ്ടാകത്തക്കവിധം ഗോതമ്പിന്റെ പലേ ഇനങ്ങൾ സൃഷ്ടിച്ചെടുത്തതാണു് മറെറാരു നേട്ടം.

Aids to Better Production

In a scheme outlined for intensifying production Sir G. Cunningham, member of the British Economic Planning Board has stressed on the following five points as aids to advance productive efficiency.

(1) Co-operation Between Firms:—

First let us consider the position of management. This seems to call for consideration under two heads. The first is the question of co-operation between firms.

There is no works in the world that is yet perfect, and there is always something to be learned from one's neighbour, even-though he may not be making the same class of goods. One can sometimes learn, how not to do a thing in a bad works, and it is as important to learn, how not to do an operation as to learn how one should do it.

In order to meet this measure of assistance in industry the Anglo-American Council on Productivity has arranged, and is still arranging, extensive visits for technicians and others to see how American productive efficiency is achieved.

We cannot all go to America, but surely we can open our own doors to each other just as freely, if not more freely, than the Americans open their doors to us. With this thought in mind, trade associations and various other bodies are arranging for what is called "Mutual Aid in Industry", so that one manufacturer gives assistance to another and in this way groups are got together and consultations take place among the management in all its grades to see how we can improve our present methods of manufacture.

This is a grand and constructive idea which merits the consideration of all people engaged in industry. Why should we not all large and small—start right away to see how we can help each other to help the country through its present economic difficulties.

(2) Works Relations:—

There are still many managements who need to reflect on improved works relations. A lot has been said on this subject and unquestionably tremendous progress has been made.

In this respect, we are ahead of our American friends, but that does not mean that we have not still a long way to go. I hold the view that joint-production committees have done a great deal in promoting confidence between managers and workpeople, but there are still many men and women on the factory floor who lack an adequate understanding of their firm's problems and objectives. Management will only get out of these committees what they put into them.

It is not enough merely to operate a joint production committee. Every manager should apply these tests:—

(1) "Do my workers have an adequate understanding of our objectives and difficulties?" and

(2) "Do I understand and appreciate their difficulties?"

If not, there is room for improvement.

While works relations have progressed in recent years, I believe there is still room for their very much wider application.

(3) Strikes and Absenteeism:—

There is still far too much time being lost to industry as a result of strikes and voluntary absenteeism. Absenteeism can in part be corrected by better works relations, but a great responsibility rests with trade union officials and the workers themselves to assist management in overcoming unnecessary absence from work.

There are responsibilities on the shoulders of all of us today. This is not a one-sided affair with all the blame on management; all sides must face up squarely to their national duties. The high incidence of strikes is a matter on which I claim the workers are very much at fault. Although in 1948 fewer working days were lost in industrial disputes (1,944,000*) than in any year since 1943, the industrial output lost by strikes is still far too high. Let us make no bones about it—unofficial strikers today are enemies of the State.

There is perfectly adequate machinery for settlement of disputes, yet strikers persistently ignore this machinery.

If the present machinery for handling industrial disputes is inadequate, then discussions should take place between representatives of management and workpeople; but whatever machinery is agreed, bargains must be kept. Failure to keep them should be penalised by heavy sanctions.

Illegal strikes should be punished by some forfeiture of civil rights, and the unofficial strikers should have their cards marked. Leaders of illegal strikes should be fined, and if necessary subjected to more severe punishment. When the safety of the State is being jeopardised, it is no time for timidity. Strong measures must be adopted.

(4) Time and Motion Study:—

The next point is really one for management, but it closely concerns the workers because it is one on which many still need to reorientate their views. It refers to the question of Time and Motion Study, against which some sections of workpeople still seem to have a considerable degree of unreasonable prejudice.

Although this prejudice is unreasonable, it is, at the same time, understandable, for it is based—as are many industrial disputes—on fear of unemployment. This fear, however, has its root in a fallacy, for "going slow," far from creating employment, tends to create unemployment.

* Ministry of Labour Gazette.

(5) Plant and Raw Materials:—

The last point concerns the need of industry for better plant and a freer flow of raw materials. There is not much to be said about the first item.

Industrial capital has been and is being starved of the means of procuring the most up-to-date equipment. It will take many years to repair the ravages and gaps left by the war.

As to the question of raw materials, this is largely a matter of removal of controls and there has already been considerable progress. The evil of controls—not always recognised by the controllers—is that it impels factories to lay in stocks in case allocations do not come up to expectations.

Here again, bulk-buying must inevitably have a retarding effect on production. With improved plant and greater availability of raw materials management can advance in standardisation of production which will inevitably give greater productive efficiency in every workshop in the country.

In conclusion, we have been told often and clearly enough that only by increasing productive efficiency can we maintain and improve our standard of living. To achieve our objectives the whole-hearted co-operation of all sides, Government, management, labour organisations, and workpeople, is imperative.

ബ്രിട്ടനിലെ സാമ്പത്തികാസൂത്രണബോർഡിലെ അംഗമായ സർ ജി. കണ്ണിംഗാം ഉല്പാദനം വർദ്ധിപ്പിക്കുന്നതിന് രൂപപ്പെടുത്തിയ ഒരു പദ്ധതിയിൽനിന്നുമുള്ള ചില വിവരങ്ങളാണ് ഈ ലേഖനത്തിൽ അടങ്ങിയിരിക്കുന്നത്. തൊഴിൽശാലകളിൽ പ്രവർത്തകരും തൊഴിലാളികളും തമ്മിലുണ്ടായിരിക്കേണ്ട ബന്ധം, തൊഴിൽശാലകളും അന്യോന്യബന്ധവും ആശയവിനിമയവും പുലർത്തേണ്ടതിന്റെ ആവശ്യം, പണിമുടക്കങ്ങൾകൊണ്ടു സംഭവിക്കുന്ന ദേശീയമായ പാപ്പരത്വം മുതലായി പല സംഗതികളും ഈ ലേഖനത്തിൽ വിശദമാക്കിയിരിക്കുന്നു.

AGRICULTURAL CO-OPERATION IN ENGLAND

By
Frederick Brundett.

SINCE the agricultural co-operative society movement was launched more than 70 years ago it has grown into a formidable organisation. In England today there are no less than 184 agricultural co-operative societies of farmers and growers; they have 120,000 members and a total annual turnover of about £ 30,000,000.

It was in 1867 that Edward Owen Groening founded the first agricultural co-operative society in England. It was known as the Agricultural and Horticultural Association, and its headquarters were in London. For nearly half-a-century this organisation provided its farmer members with their requirements, and only came to an end during World War I. Today, the oldest surviving society in England is the Aspatria Agricultural Co-operative Society which was founded in 1870 by the farmers of Cumberland who had been the victims of fraudulent sales of fertilisers.

All the agricultural co-operative societies in England today are purely voluntary organisations of agricultural producers registered under the Industrial and Provident Societies Act. But, in addition, there are a small number of apple-packing stations run on a co-operative basis by agricultural producers, which are registered under the Companies Acts, but are eligible for affiliation to the Agricultural Co-operative Association.

The agricultural co-operative societies can be divided into three main types. First, there are those societies which supply all kinds of farming equipment; secondly, those organisations which market farm produce such as grain, wool, bacon, eggs, dairy and horticultural produce; and thirdly, those societies which render specialised services such as the hiring of machinery, threshing, hatching and the arranging of artificial insemination.

SOCIETIES VARY IN SIZE.

Naturally, the societies vary in size from country to country: they range from the large all-purpose society with several thousand members which gives its services in a wide area and has an annual turnover of more than £ 1,500,000 to the small specialist society of about a dozen members which concerns itself exclusively with threshing or the hiring of machinery.

At first, the progress of the movement was slow, and a survey in 1891 showed that only about 30 societies were operating. The majority of these were concerned with providing farmers' requirements but a few specialised in dairy products.

In 1901 the Agricultural Organisation Society was formed to act as a central organisation to assist individual societies, protect their interests and undertake propaganda for agricultural co-operation.

During the following twenty years there was considerable progress, and in 1920 in spite of the difficulties caused by World War I, there were 381 societies with a membership of over 80,000 and a turnover of about £ 17,500,000, of which about £ 10,000,000 represented requirements and the remainder receipts from the sales of produce.

BULK TRANSACTIONS.

The Agricultural Organisation Society was not a trading body, but in 1918 it sponsored the formation of the Agricultural Wholesale Society to handle bulk transactions on behalf of its members. Unfortunately, the Agricultural Wholesale Society had a brief and chequered history. It collapsed in 1924, and its failure undoubtedly undermined the position of the Agricultural Organisation Society which quickly followed it to the grave.

Between 1924 and 1945 the agricultural co-operative movement in England had no central organisation of its own. During World War II the problem of feeding the population was extremely acute, and the rigid rationing system adopted necessitated the distribution of many commodities through definite channels. This new factor altered the whole system of marketing, and gave the efficient agricultural co-operative societies opportunity to demonstrate the advantages of their methods.

They were not slow to grasp their chance, with the result that many farmers, who were forced whether they liked it or not to sell their produce in an organised manner, quickly learned that really efficient organisation of their own produced better results than the private trader. This wartime development gave a decided boost to agricultural co-operation. The societies, and particularly their managers, realised that this improved position could only be maintained in changing conditions if steps were taken to improve their efficiency by co-operation among themselves, and by continuing the process of educating the farmer in co-operative principles. This end could not be achieved without active leadership of the movement. The result was the formation in 1945 of the Agricultural Co-operative Association.

REPRESENTATIVE ORGANISATION.

Although only recently formed, the Association can already claim with justice that it represents the great bulk of the agricultural co-operative societies in England and has already done valuable work, particularly in education and propaganda.

In many countries, the industrial and agricultural co-operative movements are under the same control or at least closely linked. This is not so in England, where the two have no formal organisational connection at all. The agricultural movement, in particular, has been careful to keep out of the industrial field, and the agricultural societies do not sell things like groceries, provisions or household goods.

The Agricultural Co-operative Association is showing a practical and wise approach to its difficult

problems, and there is every indication that the movement will expand judiciously from a firm and substantial base. It looks, in fact, as though the attractions of a too rapid rate of growth are properly being tempered by a realistic appreciation of the dangers involved.

There is no doubt that the most important work of the Agricultural Co-operative Association lies in the educational field, and taking into consideration the peculiarly individualistic outlook of the English farmer, it is wisely concentrating its attention on propagating the idea that modern conditions necessarily entail organisation, but that the co-operative form of organisation provides the needed help without unduly interfering with individual freedom.

Field Marshall Viscount Montgomery recently said, in connection with Western Union. "There can be no co-operation without some surrender of sovereignty." This, of course, is true in any sphere of activity, since co-operation necessarily involves duties as well as privileges. But agricultural co-operation does not mean collective farming it does not mean individual farming with co-operative handling of materials and produce, materials to the farm and produce to market.

Agricultural co-operation in England is definitely growing today. Wisely handled there is nothing to stop the movement from having an important influence on English agriculture in the future.

ഇംഗ്ലണ്ടിൽ കാർഷികസഹകരണം എത്രമാത്രമാണ് പുരോഗമിച്ചുകൊണ്ടിരിക്കുന്നതെന്ന് വെളിപ്പെടുത്തുന്ന ഒരു ലേഖനമാണിത്. "സ്വന്തം സമ്പൂർണ്ണാകാരത്തെ കുറെയൊക്കെ കീഴ്പ്പെടുത്താതെ യാതൊരു സഹകരണവും സാദ്ധ്യമല്ല" എന്ന് മോൺട്ട്-ഗോമറി പ്രഭു പറഞ്ഞതിനെ അനുസ്മരിച്ചുകൊണ്ട്, മുന്നോട്ടുപോയാൽ സഹകരണാധിഷ്ഠിതമായ കൃഷിവികസനവും തന്മൂലം സുഭിക്ഷതയും ക്ഷിപ്രസാദ്ധ്യമാണെന്ന് ലേഖകൻ അഭിപ്രായപ്പെട്ടിരിക്കുന്നു.

OILS AND FATS

WHEN it comes to nutrition, fats and oils mean just calories to many people. The caloric value of fats is extremely important but their niche in nutrition is broader than that. Those who are interested in nutrition will want to know about all the functions of fats.

Butter, cream, margarine, hydrogenated vegetable shortenings, and cooking and salad oils are the common fats used in food preparation. These are sometimes called "visible" fats. The so called "invisible" fats are not necessarily difficult to see, but are part of a food which is not primarily a fat. Examples of foods containing "invisible" fats are egg yolks, milk, cheese from whole milk, meat, nuts, chocolate and avocados.

Both "visible" and "invisible" fats are well digested. In fact, an average of ninety-five per cent of the fat eaten normally will be digested. The slow rate at which fats leave the stomach and are absorbed is an advantage and has nothing to do with digestibility. This slowness of digestion delays the return of hunger. Thus fats can give a feeling of satisfaction when they are included in the meal, even if the meal is small.

Calory Content.

All fats and oils are about equal in the amount of calories they supply. In addition to their energy value, butter and margarine are excellent sources of vitamin A.

When it comes to calories, on a weight basis, fats supply more than twice the energy available from carbohydrate and protein. Although the body is able to make fat from carbohydrate and protein, it is a good plan to include in the diet some calories in the compact form of fat.

Nutrition authorities recommend that at least twenty to twenty-five per cent of the total calories in the average diet be supplied by fat. For people who do hard physical work, and for children and teen-agers, the suggested percentage is raised to thirty to thirty-five. The so-called "invisible" fats are expected to account for one-half to two-thirds of these percentages, the rest to be supplied by butter, margarine, hydrogenated vegetable shortenings, oil and other "visible" fats.

When food fats are digested they are broken up into glycerol and fatty acids, the chemical substances of which they are composed. The body then remakes the fats for its own use if they are not needed for immediate energy. The fatty acids are recombined in such a way that the newly made fats have some properties of body fat and yet, in certain instances, may keep some properties of the food fat.

Three fatty acids of those which are unsaturated, i. e., are not fully hydrogenated, are thought to be nutritionally essential. Although the human need for these fatty acids is not known, it is suggested

that they make up at least one per cent of the total calories. In the normal diet "invisible" fats amply fulfil this allowance.

In the body, fats are the most important form of stored energy. Until used up, reserve fat may be drawn upon to furnish calories if the food supply is out below the energy requirement.

One function of fat stored in layers under the skin is to protect the body against too great loss of heat when in cold surroundings. Other functions of this fat are to protect the body from injury due to bumps and jolts and to fill out the figure when it might otherwise look gaunt. Fat is also very important as padding around the internal organs, especially the kidneys. This stored fat helps to keep the organs in place.

Essential to Growth.

Fats are a necessary part of the structure and function of all tissues. They also enable the body to absorb and make use of fat-soluble vitamins. In addition, butter and margarine are carriers of vitamin A.

Butter is a natural source of vitamin A and the precursor, carotene, which is changed into vitamin A in the body. Margarine is fortified with 15,000 U. S. P. units of vitamin A per pound.

Vitamin A is essential for growth and development. It has several other functions, too. Vitamin A plays a part in the chemical reactions of the eye which are responsible for vision. It is vital to the health of the skin and of the mucous membranes including those of the respiratory system and the alimentary tract. It also has some bearing on freedom from infectious diseases and speed of recovery from such illnesses.

The body is capable of storing a quantity of vitamin A in the liver. This reserve, built up from the diet, helps protect the body for a time if the vitamin A intake is too low.

What's New in Home Economics

'കൊഴുപ്പും എണ്ണയും' എന്ന ഈ ലേഖനത്തിൽ മനുഷ്യ ശരീരത്തിന്റെ ഘടനയിൽ കൊഴുപ്പിനുള്ള പ്രാധാന്യത്തേയും, അതുള്ള ഭക്ഷണസാധനങ്ങളുടെ ആവശ്യകതയേയും പറ്റി പ്രതിപാദിച്ചിരിക്കുന്നു. കൊഴുപ്പിൽ അടങ്ങിയ ജീവകം 'എ' കണ്ണിന്റെ കാഴ്ച പരിരക്ഷിക്കാനും, രോഗങ്ങളുടെ ആക്രമണം തടയുവാനും വളരെ ആവശ്യമായ ഒന്നാണത്രേ!

FACTS THAT INTEREST

Signs of chemical Warfare in Plant World.

Certain Groups Co-operate while Others Compete for Survival.

Scientists in the United States are conducting studies on the "social behavior" of plants and shrubs which may be important to increase the world's food supply. They are learning the chemical reasons why certain plants and shrubs co-operate while others compete with their "neighbours" for food, light and water.

Some of the latest discoveries that have resulted from these studies are described in the journal, *Scientific American*, by Dr. James Bonner, professor of biology at the California Institute of Technology.

"Plants, like animals, do not live alone," he writes. "Just as every animal's environment includes other animals, so a plant is affected by other plants in its community. There is such a thing as sociology of plants, and a very considerable amount of attention has been given to various phases of that study."

However, he states, a "remarkable phenomenon in plant relations has only recently come to light: the fact that some plants possess chemical weapons with which they attack their neighbours."

Desert plants and shrubs seem to have this particular aptitude for getting rid of competitors for water and food. In a desert area, Dr. Bonner notes, plants of an individual species are widely and uniformly spaced, apparently "as though to share the scant supplies of water and nutrients." Actually some desert plants, like the brittlebush (Encelia farinosa), produce toxic compounds that kill off all other species that happen to take root nearby. The leaves of the bruttle-bush contain a poisonous substance, identified as 3-acetyl-6-methoxy-benzaldehyde, which rains wash into the soil. It acts about as effectively on other plants as a powerful acid would on man.

Other desert shrubs, like the rubber-bearing guayule, give off toxic substances that kill their own seedlings. The roots of the guayule excrete ceramic acid into the soil—and even a tiny fraction of this acid will kill any guayule seedlings in a wide area around the parent plant.

The capacity for chemical warfare is not confined to desert plants alone, Dr. Bonner points out. "In a survey of native woody species in East California alone," he says, "it was found that the leaves of approximately half of the species collected contained principles toxic to the growth of one selected test plant."

While further detailed investigations are necessary, he says, "it appears that the production of substances inhabitory to other plants may be very wide-spread in the plant world."

At the same time, he points out that the chemical interaction

between plants is not always hostile. There are plants that produce substances which promote the growth of other plants instead of inhibiting it.——— USIS.

Uses of Atomic Energy.

Progress Reported In Medical Field.

The United States Atomic Energy Commission announced that "new and more effective" atom, bombs, tested on Eniwetok atoll in the Pacific last year, were being produced "on an industrial basis."

Uranium and plutonium for the bombs and other atomic energy uses were being produced "in greater quantities than ever before", the Commission added. These announcements were made in the Commission's sixth semi-annual report to Congress.

Under the heading "Advances in all phases of the national atomic energy programme", the Commission listed progress in the medical field, including indications that the relatively inexpensive radio-active cobalt may eventually prove to be a better treatment for cancer than radium.

The commission disclosed that it had found "stand-by uranium resources" in America that could be used at some future time for military applications in case the uranium now obtained here and abroad ceased to be available.

The United States obtains most of its uranium from the Belgian Congo and Canada. The report said that operations in the field of military application of atomic energy "have continued to accelarate during the last six months."

In the field of medicine and biology involving atomic energy materials and their effects some of the highlights reported were:

Development of a still-on-trial treatment for the relief of pain and distress in two types of heart disease—angina pectoris and congestive heart failure.

First human trials of radio-active cobalt—about 15 cases of five different types of cancer have been treated, some tumours being destroyed and others temporarily arrested. "Evaluation of results will require further large-scale work and some year time;" the report said.

Research at the University of Michigan, seeking to work out a blood test, similar to a test for Syphilis, to diagnose radiation injuries quickly:

Successful use of radio-active materials to diagnose male sex harmone deficiencies in victims of the "march of death" on Bataan during the war. Some of these men, the report said, had developed breasts like women as a result of malnutrition and tests showed that starvation had reduced their production of normal male harmones.

New Comet Theory.

Man long has been baffled concerning the nature of comets—the strange, bright, long-tailed bodies which in early times, suddenly appearing in the heavens, were regarded as portents of evil. Now, a

U S. scientist says they are astronomical glaciers, propelled, like a rocket plane, by evaporating gases.

This comet theory was developed by Dr. Fred L Whipplê, Harvard University astronomer, after an 18 month study of the structure of comets. He described his theory before the American Astronomical Society meeting at Ottawa, Canada.

The Harvard astronomer believes the comet nucleus is a mixture of extra-terestrial gravel, or rock-like substances imbedded in ice. This ice is composed of common substances like water, ammonia, methane, and carbon dioxide, frozen almost to absolute zero. The diameter of this nucleus measures perhaps half a mile.

The attraction of the sun forces this nucleus into an elongated orbit around the sun. It may take anywhere from 10,000 to 1,000,000 years to complete this orbit. But sooner or later, the nucleus approaches close to the sun—and then it becomes a comet.

Astronomers, observing comets for the last 100 years, have seen the nuclei suddenly brighten. A huge coma, or head, forms around the nucleus and this head may be tens of thousands of miles in diameter. Then a tail forms. Astronomers have long known that this tail is formed by pressure of sunlight on the tiny particles in the head of the comet.

What causes the nucleus to brighten suddenly? Dr. Whipple says the sun heats one side of the nucleus to a point where the surface ices evaporate. Some of the imbedded solid particles are released and blown away. Sunlight shining on the melted gases makes the head of the comet appear luminous. The solid particles form the tail that streams behind the comet.

Meteors, according to Dr. Whipple, are simply bits of the comet nucleus that are hurled away by the evaporating gases. Asteroids—tiny planes revolving on fixed orbits around the sun–may be merely comets from which all the gases have evaporated.—USIS.

Only those are men who strike the chains from off man's body and from off his reason.

Maxim Gorky.

He who gives himself entirely to his fellow-men appears to them useless and selfish; but he who gives himself partially to them is pronounced a benefactor and philanthropist.

H. D. Thoreau.

NEWS & NOTES

More Steel capacity coming to India.

Establishment of two new steel plants in India, each with an initial annual capacity 500,000; 600,000 metric tons and costing between $ 150 and $ 180 million, is the general recommendation of three foreign consulting firms whose reports have just been submitted to the Indian Government.

The three firms—Koppers Co. Inc., Arthur G. Mckee & Co., both of the U. S. A., and International Construction Co., Great Britain-differ slightly at several points of judgment, and in some assumptions.

In general their findings are:—

New Plants: Sites in the Central Provinces and in Orissa Province are favoured because of accessibility to raw materials. Capital cost per ton of finished product is estimated at roughly $ 300 and costs of steel bars and rods in production at between $ 60 and $ 75 per metric ton.

Raw Materials: Iron ore reserves in Central Provinces and Bihar Province are believed to be virtually in exhaustible and of top quality. Cocking coal reserves are held to be good for 150 years if used for that purpose exclusively. Limestone and dolomite reserves are adequate and manganese deposits are almost inexhaustible. But refractory production must be sharply increased.

Existing Producers: Improvements and expansion at the plants of India's two major steel makers at a final cost of $ 94 million have been approved by the consultants with the recommendation that the Government support them.

These are: At Tata Iron and Steel an immediate $ 18 million expenditure for repair or replacement of war worn plant to restore output to the war time average; later $ 25 million for a new skelp mill, a tube pipe mill and a special alloy and tool steel plants.

India's Fertiliser Needs.

The Government of India proposes to import about 400,000 tons of fertilisers during 1949-50. In addition about 75,000 tons are expected to be produced in India. Last year India obtained an allotment of 221,000 tons through the International Emergency Food Council, in addition to 56,000 tons of sulphate of ammonia from Russia.

India's fertiliser requirements far exceed the quantity proposed to be imported or produced, but dollar shortage has compelled the country to keep imports of fertilisers to the minimum. It is stated that special quotas of fertilisers will be made available for such important cash crops as jute and Tea because of their currency cashing capacity.

Further Government of India have banned the export of bonemeal, but have permitted the export of

crushed bone on the grounds that the trade in crushed bones flows into dollar areas.

U. S. Scientist Chosen.
Leader of Indian Research Group.

The appointment has been announced in India of Prof. James W. McBain, professor of Chemistry at the U. S. Stanford University, as director of the National Chemical Laboratory now under construction in Poona. Prof. McBain, who is now in India on a preliminary four-week tour, hopes to take up his appointment from October, '49, for a three year period. The National Chemical Laboratory will begin functioning early in 1950.

The Laboratory is intended to bridge the gulf between Universities, the State and other scientific institutions on the one hand and the Chemical Industry on the other. It will assist group research and will also initiate fundamental research of its own. The Laboratory will have a special interest in research to promote the fuller use of Indian raw materials.

Prof. McBain will have under him seven assistant directors for the fields of (1) inorganic and analytical chemistry (2) physical chemistry including electro-chemistry (3) organic chemistry (4) chemistry of high polymers (5) biological chemistry and evaluation (6) chemical engineering and (7) survey and intelligence. The laboratory will have in addition to these directors, 11 research officers and a total staff of 310.

Prof. McBain, a fellow of the Royal Society was awarded the Davy Medal in 1930. He is a member of the American Chemical Society and has served as chairman of its Californian Section and has been an officer of numerous other scientific societies.

INDIAN SCIENTISTS
At U. N. Conference.

Indian scientists have figured largely in the meetings of the International Technical Conference held at Lake Success during the last days.

The papers submitted by them cover practically every class of subjects before the conferences.

In the land section of U. N. Scientific Conference on the conservation and utilisation of resources Dr. Mukherjee introduced a paper jointly prepared by Mr. S. P. Ray Chaudhuri and Mr. A. T. Sen, Soil Conservation Officers of India's Agricultural Ministry. They described the investigations that India had made on run-off erodibility of soils, conservation of solid fertility and reclamation of saline tracts.

Chemical analysis of soils as well as crop response to manures and fertilisers at many centres, the joint authors said, indicated that in general the soil in many parts of India suffered from a lack of organic matter and from deficiencies of nitrogen and phosphorus which were the chief governing factors of plant growth.

Dr. Mukherjee stressed the importance of fundamental soil studies in relation to soil production and soil conservation. India, he said suffered from a shortage of trained men to carry out the intricate work in this field.

In the minerals section, there was complete agreement among the experts (who have so far spoken) that living conditions in the near future would depend upon two main factors: (1) eliminating the waste in the mineral reserves, and (2) letting down of the 'political' boundaries now hampering scientific co-operation.

Dr. M. S. Krishnan, Director, Bureau of Mines, India who read a paper prepared by Dr. D. N. Wadia, another Indian minerologist, said: "The 20th century era of wars is making it one of the biggest problems of the next century." More basic metals had been used up since 1914 than during the whole of previous human history.

Another paper was that of Mr. K. Rajagopalaswamy, chief Geologist of the Associated Cement Companies, Bombay, who said geographical factors relating to the utilisation of cement raw materials in India and Pakistan were far from ideal. They resulted in high production and distribution costs. In spite of this, the selling price of cement in India and Pakistan was not much more than in the United States. He also outlined India's plans to improve the cement industry.

Research for Increasing Food Production.

The standing Advisory Committee for Research on water Requirements of Crops has decided that, in order to step up food production in the country, research on water requirements of crops should at present be particularly concentrated on the optimum use of irrigation water so as to obtain the maximum yield of crop from a given quantity of water.

The Committee, which was recently set up by the Government of India, held its first meeting in Simla last week under the chairmanship of Shri R. L. Sethi Agricultural Commissioner, Ministry of Agriculture.

The Committee has further decided to frame standards for lay-out of trials, measurement of water, temperature, humidity etc. to enable results of experiment carried out as different stations to be compared.

In a resolution passed by the Committee it has asked Provincial and State Governments to request their Chief Engineers and Directors of Agriculture to meet and formulate proposals for the problems on which they would like research to be carried out in connection with the optimum use of irrigation water. It has been suggested that they should select three or four farms for these experiments in their respective administrations representative of the conditions prevailing in the whole area. To ensure effective co-ordination for the carrying out of these experiments it has been stressed that provision of staff at each station should include a representative each of Departments dealing with irrigation agriculture and Meteorology. A special feature of the new studies will be the malarial aspect of water standing in irrigated fields and channels.

Question Box

Question No. 58:—

Will you please inform me whether it is advisable to apply set-mortar to the cocoanut tree and if advisable the correct dose per tree ?

S. R., Perumanur, Ernakulam,

Answer:—

Set-mortar can be applied to the cocoanut tree and there won't be any injurious effect arising therefrom. But in this connection the following points have to be kept in mind:—

(1) The mortar to be applied must be of the type that has "set" completely. It should not be applied if it is in the act of setting.

(2) The mortar has to be pulverised to small grannules prior to its application. Large clods of mortar, will have no useful action either on the soil or on the crop.

(3) Since as you may probably know, slaked lime (calcium hydroxide) in the mortar gets totally converted into limestone (calcium carbonate) during the process of setting of the mortar, this carbonate will surely help to neutralize any innate acidity in the soil. It will also liberate other more important plant foods, like potash, that are locked up in the soil-body and make them available to the plant-roots.

(4) The dose of calcium carbonate per tree will vary from 3 to 6 pounds depending upon the degree of acidity in the soil. But as mortar is not all calcium carbonate but contains an admixture of sand, this dose will have to be increased so as to supply 3 to 6 pounds of calcium carbonate. The ultimate dose of mortar, therefore, depends upon the quantity of sand found mixed in it.

The application of mortar will have the same effect as applying powdered chalk. It will give maximum response only in soils deficient in lime. It is to be noted that most of the West Coast soils are lime-hungry.

Question No. 59:—

I wish to try my hand at soilless gardening. I am told it gives very good results. Will you please inform me as to the kinds and quantities of the various chemicals to be used for making the nutrient solution:

S. R., Perumanur, Eranakulam.

Answer:—

I may inform you that soilless gardening, or *Hydroponics*, as it is called, is an interesting hobby. It is indeed very popular in U.S A., where it is carried out on a very large scale involving the use of glass-houses, electric motors and pumps to circulate the solution and automatic heating equipment to maintain the nutrient medium at a fixed optimum temperature. Though one may not afford such costly apparatus, still hydroponics can be carried on on a small scale using small sized wooden tanks or even pots filled with pure sand. There are major and minor nutrient solutions.

The following list gives the quantities of the various chemicals to make up the two nutrient solutions. (1) Major Nutrient solution (to 5 gallons of water):—Superphosphate 5.8 gm., Ammonium sulphate—5'1 gm; Magnesium sulphate—10.3 gms. and Potassium chloride—3.9 gm. This solution is to be renewed every three weeks. (2) Minor nutrient solution (to 5 gallons of water): Boric acid—0 8 gm; Manganese sulphate-0.8 gm;

Zinc sulphate-0.4 gm. and Copper sulphate 0.4 gm. This is to be renewed every fortnight.

In addition to these solutions, iron solution (stock solution containing 4 oz. of ferrous sulphate) has to be used weekly or oftener if the colour of the foliage turns yellow.

The number of irrigations to be done depends upon the weather. Normally three irrigations at 4 hours intervals will be sufficient on a sunny day. If the day is cloudy even two irrigations will do. The solution that drains out of a pot can be poured back into the feed-drum. The following are the important precautions to be borne in mind:— (1) The drainage must be gradual and not too quick. (2) If the pure sand is used in the pot, the sand must be kept always moist. (3) At each irrigation the sand must get fully soaked and the solution must be drained off after half an hour. (4) The solution must be kept at naturality level. (5) Maximum amount of sunlight is necessary for healthy growth, particularly so during the flowering period. During germination and during the early stages of growth too much direct sunlight should be avoided. (6) When seeds are sown nutrient solutions diluted in the ratio of 1:3 can be used till germination is complete. After that indiluted solution should be used.

Under this system of hydroponics plants grow up to giant sizes and give out their best. Very high yields can be expected.

Question No. 60:—

Can bonemeal be mixed with ash before applying to the soil ? Is there any chemical reaction ?

P. J. J., Thampanur.

Answer:—

Both bonemeal and ash can be safely mixed together and there won't be any chemical interaction between them. Bonemeal is an organic material supplying phosphoric acid and a little of nitrogen while ash is an inorganic material supplying potash.

Question No. 61:—

I find some of my cotton plants beginning to wilt suddenly. They then fall down and on examination it is found that their stems are found broken at ground level. May I know what this is due to and how to check this damage ?

R. D. N., Khilpatti.

Answer:—

The symptoms detailed in your letter point to an insect attack. This particular insect is called. *The Cotton Stem Weevil* (Pempheres affinis). This weevil usually bores into the cotton stem near ground level. The grub goes up the stem by making spiral burrows just underneath the bark. The grub literally eats its way and if the plant is young it will suffer greatly. The xylem tubes, through which the nutrient fluid is absorbed by the root-lets flows upward, will be totally destroyed and the plant will exhibit symptoms of sudden wilting, which will invariably and in the death of the plant. If the plant is well grown then gall formation will take place at the spot where the weevil is carrying out its nefarious work. The stem will be found swollen and the plant is liable to break down in a strong wind.

Fortunately this weevil is not a very serious pest of this crop. Generally only a few plants here and these are found affected. The best way of controlling this pest is to pull out the affected plants and burn them. Whenever a plant shows signs of sudden wilting, the plant must at once be plucked out and destroyed. Such eradication of affected plants can best be carried out as soon as cotton picking is over. Such a procedure will help to keep down the ravages of this pest.

T. S. Ramakrishnan,
Agricultural Chemist.

AUGUST INFORMATION.

Mr. H. W. Van Ness.

After three years of service with F. A. C. T. as General Factory Superintendent, Mr. Van Ness has departed for America on the 7th August last. His ripe experience extending over a period of twenty-three years in various Chemical plants in America was of considerable help to us.

A quarter of a century ago when Mr. Van Ness started his career, Synthetic Ammonia was only an idea. In 1926 the first Synthetic Ammonia plant was put up in Syracause, N. Y. and Mr. Van Ness was one of the Chemical engineers in that plant. Later, when a huge plant for the same purpose was set up at Hopewell, Va. he was selected to help in the design, construction and operation of the plant. During World War II he was an officer in one of the largest U. S. Army Ordinance plants for making Synthetic Ammonia.

On the basis of such wide experience his services were secured for starting operations in this factory and he has proved his worth in the successful commissioning of the different units and in training the necessary personnel for operating them.

We have great pleasure in placing on record the deep appreciation of both the Management and the staff for the work he has done here.

We equally appreciate the gift of the Indian National Flag which he has sent on to us after his departure from here. This gesture clearly indicates the good-will and fellowfeeling that Mr. Van Ness has for us.

We thank him and wish him Godspeed.

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Independence Day at F. A. C. T.

The Independence Day was celebrated this year as usual with great enthusiasm. The Colony premises were beautifully decorated, with a "shamina" in front of the Canteen and with arches, Tricolour flags, and multi-coloured lighting arrangements. Nature was also in one of her most sunny moods and contributed not a little to the success of the celebrations.

The functions were started at 8 A. M. sharp by the hoisting of the National Flag, accompanied by the singing of "Jana Gana Mana" and "Vande Mataram". Arrangements were made for poor feeding at noontime and all the poor people who flocked the colony precincts were sumptuously fed. There was a grand sports meet in the afternoon accompanied by a "Physical Demonstration" by Messrs. Ittanpillay and party, after which the meeting started with Mr. Van Ness in the chair. Messrs. Gopala Pillay and S. C. S. Menon spoke on the occasion. The highlights of the meeting were the Kathakalakshepam by Mr. Sekharan, and the two tableaux by the children of the Colony Kindergarten School. Both

were highly appreciated and applauded by the audience. Mrs. Bayer distributed the prizes to the winning competitors, whose names are as follows:—

I. Inter-Division Tournaments.

Football	Engineering.	Winners.
Volley Ball	Engineering.	
Basketball	Administration.	
Badminton	Gas Division.	
Tug of War	Engineering.	

II. Open Tournaments.	**Winners**	**Runners up.**
Tennis Singles.	S. B. Iyer.	Rama Varma.
Tennis Doubles.	V. S. Pillay & Varma.	Kasturirangan & S. M. Sastry.
Badminton Doubles.	Anantharaman & Lekshmi Narasimhan.	Madhavan Nair & Kamath.
Ping-Pong	Doraswamy	Daniel.
Bridge	P. N. Menen & K. C. George.	Mr. & Mrs. Van Ness
Cards 56.	S. B. Iyer & Partners.	G. K. Iyer & partners.

III. Sports.	**Winners.**	**Runners up.**
1 Mile race	B. S. Gopalan	K. V. Subbarao.
400 Meters	K. C. Iype	Madhavan Nair.
100 Meters	K. V. John	K. C. Iype.
High Jump	Thomas Koshy	R. K. Menon.
Long Jump	K. V. John	R. K. Menon.
Sack-race	C. R. Madhavan	R. Jaganath.
Fancy Dress Competition.	R. K. Menon	Kutty.
Musical Chair. (Ladies)	Mrs. K. V. Srinivasan	Mrs. S. B. Iyer.
Children's Race	(a) Moorthy	Sylva.
	(b) Karthikeyan	Balakrishna & Raju (tie)

In addition to these prizes, Mr. Ittampillay was presented with a cup and Mr. Sekhar a medal.

The celebrations came to a close with a grand Kathakali Dance at night by Kala Mandalom Krishnan Nair and party.

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Marriage.

The marriage of Sri T. Joseph, Foreman, gas Division, with Sr. Annamma, daughter of Sri Kuruvilla Kuruvilla of Parakat, Bharananganam was solemnised at the Forana Church, Bharananganam on the 22nd of August.

We extend our hearty felicitations to the couple.

പനയിൽനിന്നു് ഭക്ഷ്യാല്പാദനം

ഭക്ഷണദൌർല്ലഭ്യം ഇല്ലാതാക്കുവാൻവേണ്ടി പല തീവ്ര പരിശ്രമങ്ങളും ചെയ്തുകൊണ്ടിരിക്കെ ഇന്ത്യയിൽ സുവ്യക്തമുള്ള പനവൃക്ഷങ്ങളുടെ കഴിവുകളെക്കുറിച്ചു് പര്യാലോചിക്കുന്നതു് അവസരോചിതമായിരിക്കും.

ധാന്യങ്ങളുടെ കുറവു തീർക്കാനുള്ള വഴികളിലൊന്നു്, അവ കൂടുതൽ സ്ഥലത്തു് കൃഷി ചെയ്യുകയാണല്ലൊ. ആഹാരസാധനങ്ങളും ഉണ്ടാക്കി എടുക്കാവുന്നതു് ധാന്യങ്ങളിൽനിന്നു മാത്രമല്ല. ശർക്കരക്കു് ഭക്ഷണകാര്യത്തിൽ പ്രധാനമായ ഒരു സ്ഥാനമുണ്ടു്.

ഇന്നു ശർക്കരയും പഞ്ചസാരയും കിട്ടാൻ മുഖ്യമായി കരിമ്പിനെയാണു് നാം ആശ്രയിക്കുന്നതു്. ഇന്ത്യയിൽ ഏതാണ്ടു് 40 ലക്ഷം ഏക്കർ സ്ഥലത്തു് ഇന്നു കരിമ്പുകൃഷി ചെയ്യുന്നുണ്ടു്. ഈ സ്ഥലത്തൊക്കെ ധാന്യം കൃഷി ചെയ്യാവുന്നതാണു്. ഇതിൽ 60 ശതമാനം സ്ഥലത്തു് ജലസേചനംകൊണ്ടാണു് കൃഷി നടത്തുന്നതു്. ഇതിന്റെ അർത്ഥം, നല്ല വിളവുണ്ടാകുന്ന സ്ഥലത്താണു് ഈ കൃഷി നടത്തുന്നതെന്നതാകുന്നു. കരിമ്പുകൃഷി ചെയ്യുന്ന സ്ഥലത്തു് ഇരുപ്പൂവിൽ ധാന്യവിളവിറക്കാവുന്നതാണു്. 40 ലക്ഷം ഏക്കർ സ്ഥലത്തുനിന്നു് 10 ലക്ഷം ടൺ പഞ്ചസാരയും 40 ലക്ഷം ടൺ ശർക്കരയുമാണു് ഇന്നു ലഭിക്കുന്നതു്. ഇന്ത്യയിൽ ഇന്നു് ആളൊന്നുക്കു് ശരാശരി ഇരുപത്തഞ്ചര റാത്തൽ ശർക്കര വീതമാണു് ചെലവായി വരുന്നതു്. ഇതു 46 റാത്തൽ വീതം ആക്കണമെന്നു് ഭക്ഷ്യശാസ്ത്രജ്ഞന്മാർ പറയുന്നു. ഇതിനു് 30 ലക്ഷം ഏക്കർ സ്ഥലത്തുകൂടി കരിമ്പുകൃഷി നടത്തണം. ഇങ്ങിനെ ചെയ്താൽ ഇന്നത്തെ ധാന്യക്ഷാമം വർദ്ധിക്കും.

ശർക്കര, പഞ്ചസാര മുതലായ സാധനങ്ങളും മധുരമുള്ള പനംകള്ളിൽനിന്നും ഉണ്ടാക്കാം. ധാന്യകൃഷിക്കു പറ്റാത്ത തരിശുഭൂമിയിലാണു് പനകളും വളരുന്നതു്. ഇന്ത്യയിൽ ഏതാണ്ടു് അഞ്ചു കോടി പനകളുണ്ടെന്നു് കണക്കാക്കിയിരിക്കുന്നു. ഇവയിൽ ഒരു കോടി വൃക്ഷങ്ങളോളം ഇന്നും ഉപയോഗിച്ചുവരുന്നുണ്ടു്. അവയിൽ കുറെ എണ്ണം മദിരാശിയിലും ബങ്കാളിലും ചക്കരയുണ്ടാക്കുവാനാണു്. ഏതാനും എണ്ണം മദ്യനിരോധനമില്ലാത്തിടത്തു് മദ്യമുണ്ടാക്കാനുമാണു്. ബാക്കി 2 കോടി വൃക്ഷങ്ങളിൽനിന്നു് പതിനേഴര ലക്ഷം ടൺ ശർക്കരയുണ്ടാക്കാം. ഇങ്ങിനെ ചെയ്താൽ ഏതാണ്ടു് ഏഴു ലക്ഷം ഏക്കർ സ്ഥലത്തുകൂടി ധാന്യം കൃഷിചെയ്യാൻ കഴിയും.

ആവശ്യമുള്ള ഭക്ഷണസാധനങ്ങളെല്ലാം എല്ലാവർക്കും വേണ്ടത്ര കിട്ടുകയെന്നതാണു് നമ്മുടെ ലക്ഷ്യം. കരിമ്പിൽനിന്നല്ലാതെ ശർക്കരയും പഞ്ചസാരയും കിട്ടാൻ വഴിയില്ലെങ്കിൽ കരിമ്പുകൃഷി ചെയ്യുന്ന സ്ഥലം ഇന്നത്തേക്കാൾ വർദ്ധിപ്പിക്കേണ്ടതായി വരും. കൊല്ലംതോറും ജനസംഖ്യ 50 ലക്ഷംവീതം വർദ്ധിക്കുന്നുണ്ടു്. ഇവരുടെ ആവശ്യങ്ങൾകൂടി നിറവേറ്റണമെങ്കിൽ, 21000 ഏക്കർ സ്ഥല

ത്തു് കൊല്ലംതോറും പുതിയതായി കരിമ്പുകൃഷി ചെയ്യേണ്ടതായ്യരും. എന്നാൽ പനയിൽനിന്നും പഞ്ചസാര യുണ്ടാക്കാൻ തുടങ്ങിയാൽ ഇതു കൂടാതെയും കഴിക്കാം.

കരിമ്പു കൊള്ളികുത്തുന്നതു് സാധാരണമായി കൊല്ലത്തിൽ ഒരിക്കലാണു്. വളരെ ചെലവുചെയ്തു നടത്തിയ പരീക്ഷണങ്ങൾക്കുശേഷം രണ്ടോ മൂന്നോ കൊല്ലം ഇതു നിലനിത്താമെന്നു് കണ്ടിരിക്കുന്നു. യാതൊരു ചെലവും പുതുതായി വരാതെ പനയിൽനിന്നും വളരെക്കാലം തുടച്ചയായി പഞ്ചസാരയുണ്ടാക്കാം. കരിമ്പു് തനിയെ പടർന്നുപിടിക്കുകയില്ല. അതു് പറിച്ചിട്ടുകതന്നെ വേണം. പന തനിയേ വളരുന്നു. ഇന്നുള്ള പനകളെല്ലാം തനിയേ ഉണ്ടായവയാണു്.

ഇതിനെല്ലാം പുറമേ പനകൊണ്ടു് വേറേ ചില ഗുണങ്ങൾകൂടിയുണ്ടു്.

പനയുടെ വേരുകൾ ആഴത്തിലിറങ്ങിപ്പോകുന്നു. പുറമേ പരക്കുകയില്ല. നേരേമറിച്ചു്, കരിമ്പുകൃഷി ചെയ്താൽ ഭ്രമിയുടെ ഫലപുഷ്ടി കുറയും. തന്നിമിത്തം കരിമ്പുകൃഷിക്കു് വളരെ വളം ചേർക്കേണ്ടതുണ്ടു്. അങ്ങിനെ കരിമ്പുകൃഷി ചെയ്യാത്ത കാലത്തു് മറെറന്തെങ്കിലും വിളവെറക്കുക എന്നതാണു് സാധാരണ പതിവു്. ചിലപ്പോൾ കരിമ്പിന്റെ കൂട്ടത്തിൽ മറെറന്തെങ്കിലുംകൂടി കൃഷിചെയ്യും.

കരിമ്പിനു് എപ്പോഴും നനവു് ആവശ്യമാകയാൽ, വെള്ളം കെട്ടിനിത്തേണ്ടി വരുന്നതുകൊണ്ടു് പല സംസ്ഥാനങ്ങളിലും വളരെ സ്ഥലം ഒരു കൃഷിക്കും പററാത്തതായി കിടപ്പുണ്ടു്. പ്രത്യുത പുഴ, തോടു് മുതലായവയുടെ വക്കും പാടത്തെ വരമ്പുകളും മഴക്കാലത്തു് ഇടിഞ്ഞുപോകാതിരിക്കുവാൻ പനകൾ സഹായകമായിരിക്കും. ഇതിനുവേണ്ടി ബങ്കാം, മദിരാശി, ബോംബെ, ബീഹാർ, ഒറീസ്സാ മുതലായ സംസ്ഥാനങ്ങളിൽ പന നട്ടുപിടിപ്പിക്കൽ ഒരു പതിവായിട്ടുണ്ടു്.

പനമരങ്ങൾ വാടാപ്പച്ചയാണു്. ഭ്രമിയുടെ അടിയിൽനിന്നും വെള്ളം വലിച്ചെടുക്കുവാൻ കഴിയുന്നതുകൊണ്ടു് മഴ കുറഞ്ഞ ദിക്കുകളിൽ കൂടി ധാരളമായി ഇവ വളരും.

ശർക്കരയും പഞ്ചസാരയും ഉണ്ടാക്കാമെന്നതിനു പുറമെ, താഴെ പറയുന്ന ഉപയോഗംകൂടി പനകൊണ്ടു സാധിക്കാം.

ഊറിയെടുത്ത ഉടനെ മധുരമുള്ള പനംകള്ളു കുടിക്കുന്നതു് വളരെ ആരോഗ്യകരമാണു്. അതിൽ പ്രധാന ജീവകങ്ങളും ധാതുക്കളും ഔഷധാംശങ്ങളുമുണ്ടു്. പനംതേങ്ങാപച്ചയും പഴുത്തതും ഉപയോഗിക്കാൻ കൊള്ളാം. അതു വളരെ വിലക്കുറവുള്ളതാണു്.

ഇളംപനയോല പശുക്കൾക്കു കൊടുത്താൽ പാൽ വർദ്ധിക്കും. മറെറാന്നും തിന്നാൻ കിട്ടാത്ത കാലങ്ങളിൽ ഇതു ഭക്ഷിച്ചാണു് കന്നുകാലികൾ ജീവിക്കുന്നതു്.

പനയോലകൊണ്ടും നാരുകൊണ്ടും ബലമുള്ള ചൂണ്ടൽകണ്ണികളും കുട്ടകളും ഉണ്ടാക്കാം. മരത്തടികൊണ്ടു് ചെറിയ തോണി ഉണ്ടാക്കാറുണ്ടു്. പനയോലകൊണ്ടും മരംകൊണ്ടും മാത്രം തൊഴുത്തുണ്ടാക്കാറുണ്ടു്.

കൃഷിക്കാവശ്യമായ മറ്റു പല സാധനങ്ങളും പനകൊണ്ടുണ്ടാക്കാം.

വിളവു പുഷ്ടിക്കാൻ തേനീച്ചകൾ വളരെ സഹായിക്കുമെന്നുള്ളതു് പ്രസിദ്ധമാണല്ലോ. പനന്തോട്ടങ്ങളിൽ തേനീച്ചകൾ ധാരാളമുണ്ടാകും. മറെറങ്ങുനിന്നും തേൻ കിട്ടാനില്ലാത്ത പ്പോൾ ചെത്തുന്ന പനകളിൽനിന്നും ഈച്ചകൾക്കു് ഒന്നാംതരം ഭക്ഷണം കിട്ടും. അതിനാൽ തേനീച്ച വളർത്തലും ഈ സ്ഥലങ്ങളിൽ നടത്താവുന്നതാണു്.

പനയിൽനിന്നും പഞ്ചസാരയുണ്ടാക്കുക താരതമ്യേന ആദായകരമല്ലെന്നു പറയുന്നു. ഇക്കാര്യം സംബന്ധിച്ചു് താഴെപറയുന്ന സംഗതികൾ ഓർക്കുന്നതു നന്നു്.

1. ഇന്ത്യയിൽ ഇന്നു വെള്ള പഞ്ചസാരയുടെ വില, ലോകത്തിലെ മറുഭാഗങ്ങളിലെ ശരാശരി വിലയുടെ ഇരട്ടിയാണു്. 23 കോടി ഉറുപ്പികയോളം മുടക്കും മുതലുള്ള ഈ വ്യവസായത്തിനു് ഗംഭീരമായ രക്ഷ നൽകീട്ടാണു് ഈ നില വന്നതെന്നു പ്രത്യേകിച്ചും ഓർക്കേണ്ടിയിരിക്കുന്നു.

2. പഞ്ചസാരവ്യവസായത്തിൽ ഏതാണ്ടു് 33 കോടി ഉറുപ്പികയാണു് ഇറക്കിയിട്ടുള്ളതു്. ഇതിൽ 25 കോടിയും യന്ത്രങ്ങൾ വാങ്ങാൻ പുറംരാജ്യങ്ങളിലേക്കു് അയച്ചതാണു്. എന്നാൽ പനയിൽനിന്നും പഞ്ചസാരയുണ്ടാക്കുന്നതിനാകട്ടെ, പറയത്തക്കയാതൊരു പ്രോത്സാഹനവും നല്കി വരുന്നില്ല. കുടിക്കാൻ പന ചെത്തൽ ഗവർമ്മെണ്ടിനു് എക്സൈസു് റവന്യൂ ലഭിക്കാനുള്ള ഒരു മാർഗ്ഗവുമാണല്ലൊ. അതിനാൽ ശക്കരനിർമ്മാണം നിരോധിച്ചിരിക്കുകയാണു്. അഥവാ അനുവദിച്ചിട്ടുണ്ടെങ്കിൽതന്നെ തുടരാൻ വയ്യാത്ത ചുറ്റുപാടുകളിലുമാണു്. ഇങ്ങിനെയെല്ലാമായിട്ടും 2 ലക്ഷം ടൺ പനംചക്കര കൊല്ലംതോറും ഉണ്ടാക്കിവരുന്നുണ്ടു്. ഗവർമ്മെൻറുകളുടെ ശരിയായ പ്രോത്സാഹനത്താൽ വളരാൻ അളവറ്റ കഴിവുള്ളതും നമ്മുടെ ഭക്ഷ്യക്ഷാമത്തെ ഏറക്കുറെ പരിഹരിക്കാൻ ഉപയോഗപ്പെട്ടത്താവുന്നതുമായ ഒന്നാണു് ഈ വ്യവസായം.

The despotism of custom is everywhere the standing hindrance to human advancement.

John Stuart Mill.

Representative Government is government by men who know just enough about everything to do everything badly, and not enough about anything to do anything well.

Prince Kropotkin.

കൃഷി വികസിപ്പിക്കാനുള്ള മാർഗ്ഗങ്ങൾ

ഇത്തവണ നമുക്ക് പരാജയം പറ്റിക്കൂടാ.

(ശ്രീമതി മീരാബെൻ)

ഭക്ഷണസാധനങ്ങൾ കൂടുതൽ കൃഷിചെയ്തുണ്ടാക്കാൻ ഇന്ത്യയിൽ മുദ്രാവാക്യങ്ങളും പദ്ധതികളും കുറച്ചു കാലമായി പ്രചരിച്ചുവരുന്നുവെങ്കിലും ഇതുവരെ പറയത്തക്ക ഫലം കണ്ടില്ല. ഇതിനുള്ള കാരണമെന്ത്? പ്രതിവിധിയെന്ത്? എന്നതിനെപ്പറ്റി ഐക്യസംസ്ഥാന ഗവൺമെണ്ടിന്റെ ഒരു ഓണറി ഉപദേഷ്ടാവായ ശ്രീമതി മീരാബെൻ സവിസ്തരം നിരൂപണം ചെയ്യുന്നു.

മീരാബെൻ പറയുന്നു—നമ്മുടെ ഏറ്റവും ഉയർന്ന നേതാക്കന്മാർ ഇപ്രാവശ്യം ഭക്ഷ്യസാധനങ്ങൾ കൂടുതൽ ഉല്പാദിപ്പിക്കേണ്ടുന്ന വിഷയത്തിൽ അത്യധികം നിഷ്കർഷയോടെ മുന്നോട്ടിറങ്ങിയിരിക്കുന്നു. അവരുടെ കാഹളവിളി സകല ജനങ്ങളേയും ഉണർത്തി പ്രവർത്തിപ്പിക്കേണ്ടതാണ്. ഇത്തവണ നമുക്ക് പരാജയം പറ്റിക്കൂടാ. പറ്റിപ്പോയെങ്കിൽ, ലോകസമക്ഷം നാം പരിഹാസ്യരാകുമെന്നു മാത്രമല്ല, നമ്മുടെ നിലനില്പുതന്നെ അപകടത്തിലാകും.

ഈ അവസരത്തിൽ നമ്മുടെ ശ്രമം ഇതുവരെ ഫലിക്കാഞ്ഞതിന്റെ കാരണങ്ങളാരായുന്നതു നന്നായിരിക്കും. എന്റെ അഭിപ്രായം തുറന്നു പറയാം.

യാഥാർത്ഥ്യത്തിന്റെ സ്പർശം വേണം.

1-നാട്ടിലെ യഥാർത്ഥമായ അവസ്ഥയ്ക്കുതകുന്നതും പ്രായോഗികവും സുസംഘടിതവുമായ പ്ലാനിങ്ങ്—മുൻകൂട്ടി ആലോചിച്ചു ചെയ്യുന്ന വ്യവസ്ഥയും പദ്ധതിയും—നമുക്കില്ല. വമ്പിച്ചതും കുറച്ചുകാലം പിടിക്കുന്നതുമായ പദ്ധതികളിൽ ഗവൺമെൻറ് ശ്രദ്ധവയ്ക്കുന്നു. ചെറിയതും ഉടനേ ഫലത്തിൽ കൊണ്ടുവരാവുന്നതുമായ പദ്ധതികളെപ്പറ്റി ആലോചിക്കുന്നില്ല.

ഈ ന്യൂനത പരിഹരിക്കാനുള്ള എന്റെ നിർദ്ദേശം ഇതാണ്. നാട്ടിലേയും പ്രത്യേകിച്ച് കർഷകന്മാരുടേയും സ്ഥിതി ശരിയായറിഞ്ഞു് അവക്കാവശ്യമുള്ളതും പ്രായോഗികവുമായ പദ്ധതി രൂപീകരിക്കണമെങ്കിൽ, അത്തരം കുറെ കർഷകന്മാർതന്നെ സഹായിക്കണം. അതിനുവേണ്ടി, ഇന്ത്യയിലെനാനാഭാഗത്തുനിന്നും കൃഷിപ്രവൃത്തിക്കാരായ കർഷകന്മാരിൽ കുറെപ്പേരെ തിരഞ്ഞെടുത്തു് അവരുടെ ഉപദേശം തേടണം. അവർക്കാണ് പ്രായോഗികമായ പരിചയമുള്ളതു്. അവരാണ് കൂടുതൽ വിളവുണ്ടാക്കിത്തരേണ്ടവർ. അവരോടാലോചിച്ചശേഷം വിദഗ്ദ്ധന്മാർ പദ്ധതികൾ രൂപീകരി

ക്കട്ടെ. എന്നാൽ ഉടനടൻ ഫലം കാണുന്നതിനുള്ള വഴി തുറന്നു കിട്ടും.

ഉയർന്നവരുടെ ശമ്പളം കുറയ്ക്കണ്ടിവരും.

2- ഗവമ്മെൻറുദ്യോഗസ്ഥന്മാരുടെ ഇടയിൽ കൈക്കൂലി, സേവ മുതലായ അഴിമതികളും, പ്രാപ്തിക്കുറവും വർദ്ധിച്ചിരിക്കുന്നു. ഇക്കാര്യത്തിൽ ഗവമ്മെൻറു താണതരം ഉദ്യോഗസ്ഥന്മാരുടെ ശമ്പളം വർദ്ധിപ്പിക്കണം. അതുകൊണ്ടുള്ള ശമ്പളച്ചിലവു് വർദ്ധിപ്പിക്കുക എന്നതു് വളരെ വിഷമമുള്ള കാര്യമാകയാൽ, ഉയർന്ന ഉദ്യോഗസ്ഥന്മാരുടെ ശമ്പളം കുറെ ചുരുക്കുകയാണു് ഇതിനുള്ള ഒരു നിവൃത്തിമാർഗ്ഗം.

ചില വകുപ്പുകളിൽ ഗവമ്മെൻറുദ്യോഗസ്ഥന്മാരെ സഹായിക്കാൻ സൌജന്യമായി പ്രവർത്തിക്കാനൊരുക്കമുള്ള പൊതുപ്രവർത്തകന്മാരെ അനുവദിക്കണം. വിത്തു സൂക്ഷിക്കുന്ന സ്റ്റോറുകളിലെ സൂപ്പർവൈസർമാരെ സഹായിക്കാൻ അങ്ങനെ ചില പൊതുപ്രവർത്തകന്മാർ വാളൻറിയർമാരായിട്ടുണ്ടെന്നിരിക്കട്ടെ; യഥാർത്ഥ കൃഷിക്കാരുമായി അവർക്കു് സമ്പർക്കമുണ്ടാകണം. കൃഷിക്കാരുടെ ഉപദേശം അവർ നേടിക്കൊള്ളും.

കായ്കൃഷിമായി കാര്യങ്ങൾ അന്യരാജ്യങ്ങളിൽ നടക്കുന്നുവെന്നുള്ള വിവരം ഗവമ്മെൻറു് ലഘുലേഖവഴിക്കും മറ്റും ഉദ്യോഗസ്ഥന്മാരുടേയും ജനങ്ങളുടേയും ഇടയിൽ വിതരണം ചെയ്യണം. ധാർമ്മികമായ അടിസ്ഥാനത്തിൽ പ്രവർത്തിക്കാത്തതുകൊണ്ടു് ഗവമ്മെൻറുകൾക്കും രാഷ്ട്രങ്ങൾക്കുമുണ്ടായ നാശങ്ങളും ലേഖനങ്ങൾവഴി പരക്കെ ബോധ്യപ്പെടുത്തണം.

3-പെട്ടെന്നു കാര്യം ചെയ്യുതീർക്കാൻ കഴിയാത്ത ഔദ്യോഗികചടങ്ങുകളും കാലതാമസവും നിവൃത്തിചെയ്യണം. ഫയലുകൾ കൂടിക്കിടക്കാൻ ഇടവരരുതു്. പുതിയ ഫണ്ടു് കമ്മീഷണരുടെ പ്രത്യേകാധികാരങ്ങൾ ഇക്കാര്യത്തിലുപയോഗപ്പെടുമെന്നു് വിശ്വസിക്കാം.

കർഷകസമ്പർക്കം നിർബന്ധം.

4- ഗവമ്മെൻറുദ്യോഗസ്ഥന്മാർക്കാകട്ടെ വിദ്യാഭ്യാസം സിദ്ധിച്ചിട്ടുള്ള ഉയർന്നവർക്കാകട്ടെ കർഷകന്മാരുമായി സമ്പർക്കം വേണ്ടതുയില്ല. അതുകൊണ്ടു് കൂടുതൽ ഭക്ഷണസാധനങ്ങൾ ഉണ്ടാക്കത്തക്ക സംരംഭങ്ങളിൽ അവർക്കാവേശം ജനിക്കുന്നില്ല.

നമ്മുടെ വിദ്യാഭ്യാസ വ്യവസ്ഥയാണു് ഇതിനുള്ള കാരണം. ആ വ്യവസ്ഥയിൽ ഭേദഗതി വരുത്തണം. തൽക്കാലം സിനിമാ, പത്രം, റേഡിയോ മുതലായവയിൽകൂടി ജനങ്ങളിൽ ഉത്സാഹം ജനിപ്പിക്കുവാൻ ശ്രമിക്കണം. വിദ്യാഭ്യാസവ്യവസ്ഥ പരിഷ്ക്കരിക്കണമെന്നതിൽ സംശയമില്ല. ഹൈസ്കൂൾ വിദ്യാഭ്യാസം ചെയ്യുന്ന ഒരു വിദ്യാർത്ഥിക്കു ചുരുങ്ങിയതു് ആറു മാസമെങ്കിലും പാടത്തും പറമ്പിലും കൃഷിപ്രവൃത്തി പരിചയിച്ചിട്ടുണ്ടെന്നു കാണിക്കുവാൻ കഴിഞ്ഞെങ്കിലേ വിദ്യാർത്ഥിയെ പരീക്ഷയ്ക്കിരുത്തുകയുള്ളുവെന്നു് നിശ്ചയിയ്ക്കണം. അതു

പോലെ കോളേജ് പരീക്ഷയ്ക്ക് ഒരു കൊല്ലത്തെ കൃഷിപ്രവൃത്തി നിഷ്ക്കഷിക്കണം. അങ്ങനെ സാധാരണ കൃഷിവേലക്കാരുമായി പഴകി പ്രവത്തിക്കുവാൻ വിദ്യാത്ഥികൾക്ക് സാധിച്ചാൽ, തങ്ങൾ അവരെക്കാൾ ഉയന്ന തരം ജീവികളാണെന്ന ബോധമോ നാട്യമോ പിന്നീടത്ത ഉണ്ടാകയില്ല. വിദ്യാഭ്യാസം സിദ്ധിച്ചവരും സാധാരണ കൃഷിക്കാരും തമ്മിലുള്ള സമ്പർക്കം പിന്നീട് പ്രയാസമുള്ള കായ്യമാകയില്ല.

പ്രചാരവേലയുടെ ആവശ്യം.

5—ജനങ്ങളുടെ ഇടയിൽതന്നെ സ്വന്തം ലാഭത്തെപ്രതിയുള്ള കാര്യങ്ങളിലൊഴികെ മറെറാന്നിലും വലിയ ശ്രദ്ധയില്ലാതായിരിക്കുന്നു. അഴിമതിയും കുറവും വർദ്ധിച്ചിരിക്കുന്നു.

അതില്ലാതാക്കാൻ ഗവമ്മെൻറ് നാടൊട്ടുക്കു ഒരു പ്രചാരവേല തന്നെ ആരംഭിക്കണം. അതിൽ എല്ലാ ദേശീയ പ്രവത്തകന്മാരുടേയും പൊതുജനങ്ങളുടെ തന്നേയും സഹായം തേടുകയും വേണം. പത്രങ്ങൾക്ക് ഇക്കാര്യത്തിൽ വളരെ സഹായം ചെയ്യാവുന്നതാണ്. ഉയന്ന കിടയിലുള്ള ഗ്രന്ഥകാരന്മാരും കലാകാരന്മാരും തങ്ങളുടെ കൃതികൾകൊണ്ടും പാട്ടുകൾകൊണ്ടും മറും ജനങ്ങളുടെ ശ്രദ്ധയെ സാന്മാർഗ്ഗികജീവിതത്തിലേക്കു തിരിക്കണം.

75000 ഏക്കർ ഭൂമി

കൂടുതൽ കൃഷിചെയ്യാൻ സാധിച്ചു.

മൈനർ ഇറിഗേഷൻ മുഖാന്തരം

ഭക്ഷ്യോല്പാദനവികസനപ്രസ്ഥാനം ആരംഭിച്ചപ്പോഴം മുതൽക്കേ എല്ലാ താലൂക്കുകളിലും കുളങ്ങളം, തോടുകളം മുതലായവ വെട്ടി മൈനർ ഇറിഗേഷൻ ജോലികളം ത്വരിതപ്പെടുത്തുവാൻ വേണ്ട നടപടികളം സ്വീകരിച്ചിട്ടുള്ളതാണു്. ഇതിലേക്കു് ചിലവാകുന്ന തുകയുടെ പകുതി നിലമുടമസ്ഥന്മാരിൽനിന്നും പിരിച്ചെടുക്കുന്ന പതിവുമുണ്ടായിരുന്നു. കൃഷിക്കാരെ പ്രോത്സാഹിപ്പിക്കുവാൻവേണ്ടി അതു നിർത്തലാക്കി. കഴിഞ്ഞകൊല്ലത്തെ മൈനർ ഇറിഗേഷൻ പ്രവർത്തനങ്ങളുടെ ഫലമായി വിവിധ താലൂക്കുകളിലായി 75000 ഏക്കർ ഭൂമി കൃഷിചെയ്യുവാൻ സാധിച്ചിട്ടുണ്ടു്. പുതുതായി കൂടുതൽ സ്ഥലങ്ങളിൽ കൃഷിചെയ്യുവാൻ ഈ കുളങ്ങളംകൊണ്ടു് സാദ്ധ്യമായില്ലെങ്കിൽതന്നെയും ഉള്ള സ്ഥലങ്ങളിൽനിന്നു് നല്ല വിളവെടുക്കുന്നതിനു് ഇവ സഹായകമായിതീർന്നിട്ടുണ്ടു്. 1125-ൽ ഉദ്ദേശം മൂപ്പതിനായിരം ഏക്കർ ഭൂമിക്കു് പ്രയോജനം സിദ്ധിക്കത്തക്കവിധം 1500 കുളങ്ങളം പുതുതായി കുഴിപ്പിക്കുവാൻ തീരുമാനിച്ചിട്ടുണ്ടു്. അടുത്തകൊല്ലം 3500 കുളങ്ങളും പുതുതായി വെട്ടിക്കുവാൻ നിശ്ചയിച്ചിട്ടുണ്ടു്. അങ്ങനെ ഉദ്ദേശം എഴുപതിനായിരം ഏക്കർ ഭൂമി കൃഷിചെയ്യുന്നതിനു് ഈ കുളങ്ങളം പ്രയോജനപ്പെടുമെന്നും കണക്കാക്കിയിരിക്കുന്നു.

കൂടുതൽ ഭൂമി കൃഷിക്കായി വിട്ടുകൊടുക്കണമെന്നുള്ള പദ്ധതിയനുസരിച്ചു് കുമിളി-വണ്ടൻമേടു്-ദേവികുളം റോഡിന്റെ ഉഭയപാർശ്വങ്ങളിലുമുള്ള 12500 ഏക്കർ സ്ഥലം അഞ്ചു് ഏക്കർ ബ്ലോക്കുകളായി പതിച്ചുകൊടുക്കുവാനും തീരുമാനിച്ചിരിക്കുന്നു. നെയ്യാറ്റുകര താലൂക്കിൽ ആയിരം ഏക്കർ സ്ഥലം നെല്ലും മരിച്ചീനിയും കൃഷിക്കായി വിട്ടുകൊടുക്കുന്നതാണു്. തോവാള താലൂക്കിൽ ആരുവാമൊഴിയിൽ ജലദുർഭിക്ഷതനിമിത്തം കൃഷിചെയ്യാൻ സൌകര്യമില്ലാതെ കിടക്കുന്ന ആറായിരം ഏക്കർ ഭൂമി കൃഷിചെയ്യത്തക്കവിധം അവിടെ വലിയ കിണറുകളം കുഴിപ്പിക്കുന്നതിനും അതിലേക്കു വേണ്ടിവരുന്ന ചെലവിൽ പകുതി ഗവർമ്മെണ്ടിൽനിന്നും കൊടുത്തു് കർഷകരെക്കൊണ്ടുതന്നെ കിണറുകളം കുഴിപ്പിക്കുന്നതിനും ഉദ്ദേശിച്ചിരിക്കുന്നതായറിയുന്നു.

കൊച്ചിയിൽ ചിറ്റൂർ താലൂക്കിലും ഇതുപോലെ കിണറുകളുടെ സഹായത്തോടുകൂടി കൂടുതൽ സ്ഥലങ്ങളിൽ കൃഷിയിറക്കുവാൻ ഉദ്ദേശിച്ചിട്ടുണ്ടു്. രാജ്യത്തിന്റെ വിവിധഭാഗങ്ങളിലും ഇപ്രകാരം കൃഷിചെയ്യുന്നതിനു് സൌകര്യമായ സ്ഥലങ്ങളം ധാരാളം കിടപ്പുള്ളതു്, കൃഷിക്കാക്കു പകുതി ചിലവു കൊടുത്തു് കൃഷിനടത്തിക്കുന്നതിനും ആലോചനയുള്ളതായറിയുന്നു.

ചെങ്കോട്ട താലൂക്കിൽ സാംബർ വടകര എന്ന സ്ഥലത്തു് ഓയിൽ എഞ്ചിൻ ഉപയോഗിച്ചു് കിണറ്റിൽനിന്നും വെള്ളം പമ്പുചെയ്തു് കൃഷിചെയ്യിക്കുന്നതിനും ഉദ്ദേശിച്ചിട്ടുണ്ടു്. കഴിഞ്ഞകൊല്ലം ധാരാളം ഓയിൽഎ

ഞ്ചിൻ പമ്പുകൾ കൊടുക്കുകയും അവ ഫലപ്രദമായ വിധത്തിൽ ഉപയോഗപ്പെടുത്തി കൃഷിചെയ്യുകയും ചെയ്തിട്ടുള്ളതനുസരിച്ച് ധാരാളം അപേക്ഷകൾ അതിലേക്ക ലഭിച്ചിട്ടുള്ളതായും അറിയുന്നു. കൃഷി ഡിപ്പാർട്ടുമെൻറിൽ നിന്നും ഇതുപോലെ ഓയിൽ എഞ്ചിൻ വരുത്തി ആവശ്യക്കാക്കു് കൊടുത്തു വരുന്നു.

ദക്ഷിണതിരുവിതാംകൂറിൽ കോതയാർ ഇറിഗേഷൻ പ്രോജക്ടു് അനുസരിച്ച് അറുപതിനായിരം ഏക്കർ സ്ഥലം കൃഷിചെയ്യുന്നുണ്ടു്. അതിൻെറ പരിപോഷണാർത്ഥം ആരംഭിച്ചിട്ടുള്ള പെരുഞ്ചാണി അണ മുഖേന കൂട്ടതലായി ഏഴായിരം ഏക്കർ സ്ഥലത്തു് വെള്ളം കിട്ടുവാൻ സൌകര്യപ്പെടുന്നതാണു്. ഇതിനകം കൃഷിചെയ്യപ്പെട്ടിട്ടുള്ള 60000 ഏക്കർ സ്ഥലത്തേക്കാവശ്യമുള്ള വെള്ളം ഇങ്ങിനെ ലഭിക്കുന്നതാണു്. ഈ ജോലികളെല്ലാം പുരോഗമിച്ചുകൊണ്ടിരിക്കുന്നു. ഇതിനകം ഉദ്ദേശം 34 ലക്ഷം രൂപാ ചിലവായിട്ടുണ്ടെന്നും ഇനിയും 89 ലക്ഷം രൂപാകൂടി ചിലവാക്കുന്നപക്ഷം ഈ എക്സ്റ്റൻഷൻ രണ്ടു കൊല്ലത്തിനകം പൂർത്തിയാക്കുവാൻ സാധിക്കുമെന്നും അറിയുന്നു. ഈ പദ്ധതിയനുസരിച്ചു് 1125-ൽ മൂവായിരം ഏക്കറും അടുത്തകൊല്ലം ഏഴായിരം ഏക്കറും കൃഷിചെയ്യാവുന്നതാണു്.

വളം

ഭക്ഷ്യോല്പാദനപ്രസ്ഥാനത്തിൻെറ ആരംഭകാലം മുതൽക്കേ കൃഷി ഡിപ്പാർട്ടുമെൻറു് ശാസ്ത്രീയവളം ഉപയോഗിക്കുവാൻ കർഷകരെ പ്രേരിപ്പിച്ചുവരുന്നുണ്ടു്. തിരുവിതാംകൂറിൽ ഗവമ്മെൻറു് യഥാർത്ഥ വിലയുടെ മൂന്നിലൊന്നു് സബ്സിഡി അടിസ്ഥാനത്തിൽ വളം വിതരണം ചെയ്തിട്ടുണ്ടു്. കൊച്ചിയിൽ വളം കൂട്ടുചേർത്തും പൊടിച്ചും നൽകിവരുന്നു. തിരുവിതാംകൂറിൽ കൃഷിഡിപ്പാർട്ടുമെൻറിൻെറ നിർദ്ദേശമനുസരിച്ചു് കർഷകർ കൂട്ടുവളം ഉപയോഗിക്കുന്നു. താമസിയാതെ കൊച്ചിയിലെ സമ്പ്രദായം തിരുവിതാംകൂറിലും നടപ്പിൽ വരുത്തുവാനാണു് ഉദ്ദേശിച്ചിരിക്കുന്നതെന്നറിയുന്നു. ഐക്യസംസ്ഥാനത്തു് വിലയുടെ മൂന്നിലൊന്നു സബ്സിഡി കൊടുക്കുന്നതായിരിക്കും. വിവിധസ്ഥലങ്ങളിലുമുള്ള ഡിപ്പോകളിൽനിന്നും അതാതു സ്ഥലത്തെ കൃഷി ഇൻസ്പെക്ടരുടെ മേൽനോട്ടത്തിൽ വളം വിതരണം ചെയ്യുന്നതാണു്.

കമ്പോസ്റ്റു് വളം

ഓരോ കൊല്ലവും ഉദ്ദേശം 3000 ടൺ കമ്പോസ്റ്റു് വളം ഉണ്ടാക്കുന്നു. ഇതു വിപുലപ്പെടുത്തുവാൻ ഉദ്ദേശിച്ചിരിക്കുന്നു. കമ്പോസ്റ്റു് വളം ഉണ്ടാക്കുന്നതിലേക്കു് മുനിസിപ്പാലിറ്റികൾക്കും ഗ്രാമസംഘടനകൾക്കും സബ്സിഡി കൊടുത്തു് സഹായിക്കുന്നതിനും ഉദ്ദേശിച്ചിട്ടുള്ളതായറിയുന്നു. ഇതു്, തൽസംബന്ധമായി വേണ്ടിവരുന്ന കുഴികൾ കുഴിപ്പിക്കുക മുതലായ പ്രാരംഭചിലവുകൾക്കുവേണ്ടിയാണു്. ഒരു ടണ്ണിനു് 5 രൂപായിൽ കുറയാതെ സബ്സിഡി കൊടുക്കുന്നതായിരിക്കും. ഇപ്രകാരം ഉണ്ടാക്കുന്ന കമ്പോസ്റ്റു്വളം കൃഷിക്കാർക്കു് വിൽക്കുന്നതാണു്. കൃഷിക്കാർ തന്നെ അവരവരുടെ വാസസ്ഥലങ്ങ

ളായ ഓരോ വീട്ടിലും നാലടി ആറടി വിസ്താരമുള്ള ഉരക്കുഴികൾ ഉണ്ടാക്കി വളം നിർമ്മിക്കുവാൻ ശ്രദ്ധപതിപ്പിക്കുന്നപക്ഷം അത് ഏറ്റവും പ്രയോജനകരമായ ഒരു സംരംഭമായിരിക്കും.

വിത്ത്

കർഷകർക്ക് വളംപോലെതന്നെ കൃഷിക്ക് ഒന്നാംതരം വിത്തും അത്യാവശ്യമാണല്ലോ. മൂന്നോ നാലോ തരം നല്ല വിത്ത് ഡിപ്പാർട്ടുമെൻറിൽ നിന്ന് വിലയ്ക്കു കൊടുക്കുവാൻ നിശ്ചയിച്ചിട്ടുണ്ട്. ഈ വിത്തുകൾ കൃഷിക്കാരൻ വാങ്ങി ഉപയോഗിക്കാവുന്നതും ആ വിത്തുകളിട്ട് കൃഷിചെയ്യുണ്ടാക്കുന്ന നെല്ല് പിന്നീട് വിത്തായി സൂക്ഷിക്കുന്നതിനും എടുക്കാവുന്നതുമാണ്. അങ്ങിനെ വിത്തു വർദ്ധിപ്പിക്കുന്നതിനും സാധിക്കും. ഈവിധത്തിലുള്ള ഒരു പദ്ധതികൂടി പ്രയോഗത്തിൽ വരുത്തുവാൻ ഉദ്ദേശിച്ചിട്ടുള്ളതായി അറിയുന്നു.
