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"Golden Ears"

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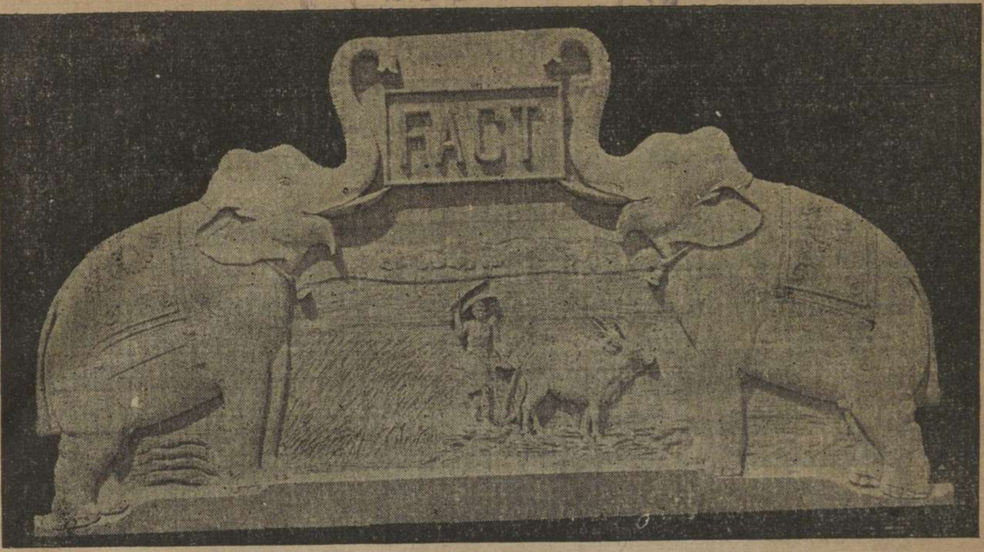

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EDITORIAL

THE FOOD DRIVE.

PANDIT Jawharlal Nehru, the Prime Minister of India, in his recent broadcast address said that India should attain self-sufficiency in food by the end of 1951. There will be no more import of food-grains after that date, and hence, the various governments and the people of the country should whole-heartedly co-operate in increasing food production by all possible methods. Some-time back, the government of India invited Lord Boyd-Orr, a specialist in the field, to study the situation and to give them workable suggestions to attain the above objective. After carefully investigating the different aspects of the problem he has pointed out the necessity for taking immediate steps in three directions, namely: (1) establishing a machinery which can function swiftly and efficiently without the normal delays of governmental apparatus (2) establishing a direct link between the formulators of programmes and policies at the top, on the one hand, and the farmers who have ultimately to work out those policies and programmes on the other, and (3) ensuring thorough co-ordination and co-operation between the centre, the provinces and the States. These findings of the expert have all been accepted by the Government of India, and they have opened up a separate department, under a Food Commissioner to deal with the question.

Our own share, at this end of the country, in this Great Effort cannot and must not be light. For, we are, pre-eminently an agricultural race depending mainly on the soil for our sustenance. We have found to our cost, in these latter days, that the time-honoured but out-of-date methods of cultivating our lands will not be economical or capable of yielding us a satisfactory reserve for situations of emergency. We have found out too that what the South Indian farmer could at best achieve, unaided by modern methods of cultivation was to eke out a hand-to-mouth existence, which circumstances have time and again proved to be highly precarious. It has been established beyond doubt that he could save himself only by intensive cultivation using up-to-date and scientific methods, such as efficient implements, good seed supply, plenty of manures and fertilisers, and proper irrigation.

Intensive cultivation of areas already under the plough, even with improved systems of manuring may not by itself go all the way to attain self-sufficiency in food production. For the present Food Drive to be effective, it is imperative that fresh areas have to be brought under cultivation in increasing proportions. Nobody could claim that all the cultivable areas available are now being properly exploited. Swamps and barren tracts could be reclaimed by drainage and irrigation, coupled with a proper use of fertilisers, and big schemes like the Malnad development scheme put into operation. But, the trouble with any scheme of bringing under cultivation any hitherto-untried region would be the uncertainty as to the yield, as well as the question whether the time, energy, and resources spent would fetch an adequate return in the short period of thirty months before us. So, the only sure method would seem to be intensive and still more intensive cultivation with all the improvements that science, experience, and hard work, could place at our disposal. Programmes and policies on such lines carried forward with sufficient enthusiasm, and a spirit of service, are sure to yield good results in the near future. The average farmer on his part, should make an earnest bid for pooling his resources, and work his already decimated holding on a co-operative and scientific basis, which alone is going to pull him through in the times ahead.

In helping the farmer on to increase his yield, by supplying him with the necessary fertilisers, and educating him in the correct and proper use of them, the F. A. C. T. organisation has been a pioneer in the field in this part of the country. And it is a measure of satisfaction for us to note that our efforts in this direction are being more and more recognised and appreciated by an ever widening circle of landowners, cultivators and other agricultural classes.

Let us, hope that with a well laid-out programme, and clearly defined policy, our governments will go ahead with the Food Drive with unabated enthusiasm, and that the people of the country will respond with sustained cooperation and hard work so that by the end of 1951 India may become not merely self-sufficient but actually hold a good margin of surplus for profitable exchange.

Editorial Board.

EDITOR'S NOTE;

With the present Issue the Fact is entering into its forth year of Publication. The occasion is taken advantage of to introduce a few alterations in the get-up of the Journal in accordance with instructions contained in the 'Standard Practice for make up of Periodicals" (issued by the Indian Standards Institution—Old Secretariat—Delhi 2.)

We trust that these changes will be appreciated by our readers. We would also welcome their suggestions for improvements in matter and make-up, consistent with the above Standard Specifications.

Economics in Transition

By

A. V. MATTHEW, B.A., B.L.

WE who now live in a period of rapid changes are confronted with a profusion of social, economic and political theories and problems. Many persons, blindly obeying uncontrollable impulses, are involved in the tendency to disintegration and are frightened unduly by prophecies of inevitable doom. Revolutionary tendencies have made remarkable progress during the past few decades. Several facts point to fraud and violence as the natural relationship between States. Power is what now counts and matters, not right which has become a sentimental name for superior force. As modern civilization increases in complexity, our economic problems become increasingly confused, appearing to have neither a fulcrum of meaning nor a centre of balance.

Economics affords an abiding structure into which to pour the perpetual flux of changing ideas and ideals, besides being a theory of community which determines the character of human history consonant with the great law of evolution and true human progress. Since economics reveals itself to us as a system in a perpetual state of transformation, variation in economic beliefs changes the course of events Economics is a criterion of evolution. The history of the world reveals the value of economics which takes on a universal significance and possesses a perfectly valid experience of the real which is quite unique. Material prosperity is born from the contact between economics and society. As we rise in the scale of living beings, there is a proportionate increase of economic activities. Economics has much core of meaning and value; it is not incredible. The concept of economics is neither meaningless nor necessarily untrue. Economic laws operate as essential methodological postulates. Economics is neither a conventional jargon with an intangible and formless idea, nor a newfangled notion invented by theorists, but an actual fact and force, whose orbit of influence is indeed very wide. The economics of any country is sure to be reflected in the political conduct of its citizens.

The need and motive for food, functioning as recognized causes and criterions of agriculture, commerce and industry, direct the affairs of mankind. Food makes claims upon the universe which makes sense out of the whole. Need for food is one of the very few massive facts that are never in dispute. All men recognize the physical necessity for food. The security of man's personality is contingent upon food. No field of study in modern times has had more brilliant interpreters than the subject of food. The problem of food scarcity is deeply involved with the problems arising out of poverty and famine. Men, as never before, are now turning to food as a necessary study, though such a study also raises disturbing questions which show that the food problem still remains unsolved. The fundamental problem of the present day is how to supply the required amount of food to all the people of the world. But the obstacles imposed by the world shortage of food are not insuperable.

Work is the source of change and reform. The absence of employment leads to moral vacancy. Work is not the mere expression of some mysterious instinct, but a kind of world process in which man must prove his destiny by participating in noble ends and lofty values, and by being equal to demands which creativity and our creature role lay upon us. The theory of work rests on human psychology and is an interpretation of human experience. With the exacting demand of work, comes a great promise. Hence employment has a supreme sphere of its own and a definite place in the scheme of things.

To quote Kropotkin: "over-work is repulsive to human nature, not work. Overwork for supplying the few with luxury—not work for the well-being of all. Work, labour, is a physiological necessity, a necessity of spending accumulated bodily energy, a necessity which is health and life itself. If so many branches of useful work are so reluctantly done now, it is merely because they mean overwork, or they are improperly organized...... If there is still work which is really disagreeable in itself, it is only because our scientific men have never cared to consider the means of rendering it less so; they have always known that there were plenty of starving men who would do it for a few pence a day."

The fundamental basis of all society is not injustice, but justice, which is advanced by vivid moral experience and verification of theories. Economic justice demands a broadening of vision which helps as a clue to the emancipation of the individual from mechanization, unnecessary restrictions, enslavement to group, threat of tyranny, dissolution of morality and disruption of social discipline. It is not a mere grandiose fiction, projected by human needs and desires, but a social milieu or atmosphere, with its precious aroma of spirituality or culture; and it is not too speculative to offer an adequate directive for current experience. The inability of men to understand the interpretations of economic justice does not discredit such interpretations. But economic injustice is never an essential element in morality, but a development from immorality. It is rationally inadmissible since it tends to reduce the influence of social morality and of the common aims of men in their daily affairs. No ethical system can possibly exist upon the basis of economic injustice. A distorted understanding of economic justice lies at the base of all opportunism.

Economics must be a service system, not a power system, and it should be reformed and further organized with that end in view. A shift in perspective is needed in society from a materialistic emphasis to a practical and ethical emphasis. We must have the willingness to change our economic plans with changing conditions, and to fight against all factors which turn our minds to the evils of unhealthy rivalry, competition and prejudice and blind our eyes against the advantages of co-operation which is closely connected with the fundamental instincts of human nature and is part of man's attitude towards life. There should be a gradual transformation of economic institutions from within, despite the prevailing conservatism in many quarters. All modern economic problems are highly relevant and closely connected with all our political problems which vex the world today.

Lecomte Du Nouy in his book, 'Human Destiny' writes: "The only goal of man should be the attainment of human dignity with all its implications. In other words, all his intellectual acquisitions, all the facilities which society puts at his disposal— schools, universities, libraries, laboratories; all those offered by religion; all the occasions given him to develop his own attitudes, his work, his leisure, must be considered by him as tools destined to improve his personality, his moral self and to make it progress. He commits an error if he sees in education and instruction a means of increasing the field of his intellectual activity, his power, or his prestige, or a means to enrich himself materially. He must use his science and his culture to better himself morally and to make others progress. Instruction is sterile if it is considered as a goal in itself, dangerous if it is subordinated to selfish sentiments or to the interests of one group. No matter how considerable it is, the accumulation of knowledge does not confer any superiority on man if he utilizes it outwardly and if he reaches the end of his life without having deeply evolved as a responsible unit of humanity. He must blind himself to the ugliness that surrounds him and not let himself be turned from his path by the pitfalls strewn under his feet. He must overcome his dislikes and fix his visions on the beauty he drains from within, for that beauty is perhaps an illusion today, but it is the truth of tomorrow."

"സാമ്പത്തികശാസ്ത്രം, നമുക്കു്", എപ്പോഴും മാറിക്കൊണ്ടിരിക്കുന്ന ആശയങ്ങളും ആദർശങ്ങളും പകർത്തിവെപ്പാനുള്ള ഒരു കരുവാകുന്നു. മനുഷ്യന്റെ ശരിയായ പുരോഗതിയും, അവന്റെ ചരിത്രസംബന്ധമായ സ്വഭാവവും വ്യവച്ഛേദിച്ചു കാട്ടുന്ന ഒരു സിദ്ധാന്തമാകുന്നു. അതു സേവനത്തിനായുള്ള ഒരു പദ്ധതിയായിരിക്കണം. അല്ലാതെ അധികാരം കൈയടക്കാനുള്ള ഒന്നായിക്കൂടാ. മാററങ്ങളുടെയും പരിഷ്കാരങ്ങളുടെയും ഉല്പത്തിസ്ഥാനം പ്രയത്നമാകുന്നു. തൊഴിലില്ലായ്മ ധാർമ്മികമായ ശൂന്യതയിലേക്കു നയിക്കുന്നു." എന്നിങ്ങനെയെല്ലാമാണു് മുകളിൽ ചേർത്തിരിക്കുന്ന ഇംഗ്ലീഷ് ലേഖനത്തിലെ പ്രതിപാദ്യത്തിന്റെ ചുരുക്കം.

ലേഖകൻ: ശ്രീ. ഏ. വി. മാത്യു ബി. എ., ബി. എൽ., കോട്ടയം.

Waste Converted Into Valuable Products

New uses for linseed straw.

By

Dr. TREVOR I. WILLIAMS

FLAX is a plant of such great economic importance and so widely distributed throughout the world that it might seem that there could be little new to learn about it and no new product to be obtained from it. Few plants are capable of being so fully utilized. The seed of flax plant is the source of linseed oil, of which many millions of tons are used every year, the great part of it going to make paints and varnishes. The remains of the seed left after the oil has been squeezed out, known as oilcake, are used as a valuable cattle food. From the stem of another plant is obtained the fibres which are spun up into linen.

It is, however, found that the varieties of flax which yield the most oil give a poor fibre and vice versa. As extraction of the fibre is a long and tedious operation-because of the difficulty of rotting the straw away-it is not usually considered worthwhile to process the straw of flax grown for the sake of the oilseed, with the result that most of it is wasted.

In Britain this waste of straw has become a serious problem, for it is difficult to dispose of except by burning, sometimes in furnaces. Under normal conditions it takes years to rot away. As nearly 100,000 acres of flax were grown last year–a vast increase in flax acreage for the U. K.—the quantity of straw to be disposed off amounted to more than 200,000 tons.

Remarkable Success.

Apart from the inconvenience of so much straw accumulating, British scientists felt that at a time when the call is for more and more productivity, this waste ought not to go on. Accordingly, they set to work to see whether any useful products might be made from linseed straw. Their remarkable success has been demonstrated in an exhibit shown at Nottingham as part of the "Quincentenary Trades Exhibition."

Cereful research has shown that every part of the straw can be used in industry—the whole straw, the fibre and the "shives" or woody part. Even the dust which forms, when the straw is processed has been found useful.

A method has been worked out for extracting the fibre from the straw and spinning it into a thread resembling jute. For doing this ordinary jute machinery can be used. The resulting thread is nearly as strong as jute. As all Britain's needs for jute have to be met by imports—at a cost five times as great as before the war—this new fibre has a promising future. Already it has found application in the carpet industry for making backings for the pile.

Almost as acute—though not so serious—as the world shortage of animal and vegetable oils is the shortage of waxes which go to the making of such varied products as polishes, candles, water-proof paper and gramophone records. The discovery that a useful wax can be extracted from the straw and the dust which comes from it is, therefore, of great importance. All known waxes—such as carnauba, beeswax and chinese insect wax—are being exploited to the limit for industrial purposes and there is a worldwide search for new sources of supply. The versatile flax plant is likely to furnish British industry with important quantities of wax.

Floor Covering.

Apart from the paint industry, large quantities of linseed oil are used in making linoleum. It is appropriate, therefore, that flax straw should yield another ingredient for making this kind of floor covering. It is found that a good wood flour—used as a filler for the manufacture of linoleum—can be made by grinding the shives to a fine powder. If the shives themselves are bonded together with plastic a satisfactory building board can be made.

The building trade is likely to benefit in other ways from this comprehensive new research in flax, for the untreated straw can be used for making building board and insulating material. The straw can also be used for making wrapping paper and cardboard.

This research, sponsored by the Department of Scientific and Industrial Research, has been carried out with the help of various trade research organisations, university laboratories and other Government departments. It is typical of the collective efforts now being made to increase productivity in every possible way. The conservation of natural resources is of great importance in a world whose population is increasing rapidly.

To find ways of converting 200,000 tons a year of waste material—which previously could only be left to rot or used as furnace fuel—into such a wide variety of useful products as building board and paper, carpet backing and linoleum filler, jute substitute and wax, is therefore a valuable achievement, the more so when it is remembered that the starting material was one whose possibilities for exploitation seemed to have been exhausted years ago.

കൃഷിവിഷയങ്ങളിൽ വിദഗ്ദ്ധനായ അമേരിക്കൻ ശാസ്ത്രജ്ഞൻ ഡാക്ടർ ടെവൊർ ഐ. വില്യംസിൻെറ ഒരു ലേഖനമാണിതു്. പല വ്യവസായ പ്രവൎത്തനങ്ങളുടെയും ഫലമായി ആണ്ടുതോറും 200,000 ടണ്ണിൽപരം ചപ്പുചിപ്പുകൾ പുറംതള്ളപ്പെടുന്നു. ഇവയിൽനിന്നു്, നാരുകൾ, സസ്യഎണ്ണകൾ, മെഴുകു്, ചായങ്ങൾ മുതലായവ ഉണ്ടാക്കിയെടുത്തു് അവയെ ഉപയോഗപ്രദമാക്കാവുന്നതെങ്ങനെയെന്നു് ഈ ലേഖനത്തിൽ വിവരിക്കുന്നു.

Conservation Of World's Natural Resources

Scientific Experts At Work

THE conservation of the world's natural resources is everywhere recognised as a task of the first importance today and scientists who work on the problem of corrosion are doing their bit to seal up an important and constant leakage of the wealth built out of natural resources and human effort.

The man in the street does not often understand what this loss means. As an instance of these losses it is estimated that the cost of corrosion in iron and steel pipes alone in Britain every year is £ 30,000,000 (Rs. 40 crores).

Corrosion is caused by the combination of oxygen in air or water with a metal. One of the most familiar examples is rust produced when iron or steel is exposed to air and moisture Rust represents a total loss. It is worthless in itself and cannot be salvaged back into good metal. If no counter-measures are taken an entire iron girder for instance, may disintegrate into red powder.

POPULAR METHODS.

Since iron and steel products are perhaps the greatest material props of civilisation (they amount to possibly 90 per cent of the total yearly metal consumption) many efforts have been made to preserve them. In theory the prevention of corrosion is simple. It requires in its simpler and traditional form merely the cleansing of the metal and the covering of its surface with anything which will keep out air and moisture.

Among well-known treatments are painting, plating and greasing. Galvanising, for instance, puts a protective coating on iron while paint supplies an impervious surface. Covering with grease, a method often used with small objects, is another way of excluding sources of oxygen. But the methods hitherto used are not always the most convenient for a particular use and there is very much more to be done to fight corrosion.

British scientific workers are playing an important part in this battle against corrosion. A number of successes have been reported in the past few weeks. One of these is "Glosscoat," a plastic substance which has been developed for use with machine parts. Other new methods are particularly interesting, because they do not rely solely on the principle of physically excluding moisture or air.

RUBBER LATEX.

The Chemical Research Laboratory announced recently that metallic products, such as machined surfaces, can be protected against corrosion even in poor conditions of storage and transport by dipping in or spraying with rubber latex to which sodium benzoate has been added. Such a wrapping does not merely keep out damp or polluted air but it positively prevents attack on the metal even if the wrapping becomes defective and lets in air. This system, however, is based mainly on the application of a protective coating which is later removed. Its advantage, as that of "Glosscoat," lies in the ease of removal as compared with grease.

CHEMICAL COATING.

Another system just announced involves an entirely original method. The goods are protected from corrosion not by anything applied to them but by creating round them an atmosphere which makes air and moisture harmless.

This technique is based on a process developed by the Shell Company and available throughout the world. The key to the process is a chemical called the Vapour Phase Inhibitor (V. P. I.) Ordinary wrapping paper, coated on one side with V. P. I., is used as a packing for metal articles–tools, engine parts and fine instruments.

The chemical, which is a white crystaline stable organic compound, slowly vapourises inside the packing and neutralises the corrosive action of oxygen in the air. There are obvious disadvantages in the use of oil and grease; they have to be applied and taken off and this means high packaging costs for manufactures as well as inconvenience for customers. The impregnated wrapping remedies these defects.

LONG LASTING.

A further advantage of the use of this chemical is that small punctures or breaks in the wrapping paper do not destroy the protection. It acts by forming a thin invisible film on the surface of the metal and this film is maintained as long as V. P. I. is present in the atmosphere surrounding it. Since it is neutral and has a long effective life, the protection it gives can last many years even in severe climatic conditions.

The tendency for the vapour to escape from the container or wrapping is slight. This sort of anti-corrosive protection is generally suitable in particular for steel products which have non-metal parts. Such parts may often be harmed by oils and greases but they do not usually suffer any harm from V. P. I.

Many different conditions have to be fulfilled by measures against corrosion for different purposes and those mentioned do not pretend to be the whole answer to a great problem. What is important is that this problem is being systematically and imaginatively attacked.

ബ്രിട്ടണിൽ ഉരുക്കു പൈപ്പുകൾ തുരുമ്പു പിടിക്കുന്നതുകൊണ്ടുമാത്രം ആണ്ടിൽ 40 കോടി രൂപായുടെ നഷ്ടമുണ്ടാകുന്നതായി കണക്കാക്കിയിരിക്കുന്നു. ലോഹസാധനങ്ങൾ തുരുമ്പിച്ചു നഷ്ടപ്പെടുന്നതു് നിവത്തേണ്ടതിന്റെ ആവശ്യവും, അതിന്, റബ്ബർ പാൽ, ചില രാസപ്പൂച്ചുകൾ, വാർണീഷുകൾ മുതലായവ ഉപയോഗിച്ചു് അവയെ സംരക്ഷിക്കേണ്ടതെങ്ങനെയെന്നും ഈ ലേഖനത്തിൽ വിവരിച്ചിരിക്കുന്നു.

Recent Researches on Rice

UNDER the auspices of the Indian Council of Agricultural Research there are now in progress 68 research schemes distributed over the various constituent Provinces and States of the Indian Dominion which aim at improving the yield and quality of the principal agricultural crops and fruits. Of these, 37 research schemes relate to foodgrains, 22 fruits, 4 potatoes and the remaining 5 the miscellaneous crops— cardamom, turmeric, cloves, coriander and pepper. Out of the 37 schemes on foodgrains rice accounts for 8, wheat 4, maize 4, pulses 14, millets 5, gram 1 and soya beans 2.

The current research schemes on rice which is the principal food crop of India are directed towards one or the other of the following objectives:

(i) Producing superior strains possessing higher yield and better quality by the application of plant-breeding methods.

(ii) Combating the fungus diseases and insect pests which attack the crop and consequently diminish the yield.

(iii) Increasing the yield by the application of manures and fertilizers.

Rice Breeding.

This work is located at four widely distant regions along the entire length of the country, namely (a) Kashmir, (b) Bombay, (c) Hyderabad and (d) Travancore under four separate schemes.

(a) *Kashmir schemes*: The work done so far has revealed the possibilities of successfully growing rice on high altitudes ranging from 7000 to 9000 feet where cereals do not thrive owing to the short season. Considerable progress has been achieved in the successful introduction of foreign varieties of rice such as Russian and Chinese types. The former variety has proved early maturing and is harvested about six weeks earlier than the local. The Chinese rices are high yielders producing from 5,000 to 6,000 lb. per acre. This represents an increase of 60 per cent over the yield of indigenous types and consequently the Chinese typer are in great demand from the cultivators. The seeds are being multiplied for distribution.

(b) *Bombay Scheme:* The object of the scheme is to obtain improved strains suitable for cultivation in the rice tracts of Gujerat, Surat, and North Thana districts of the Bombay Province. As the scheme came into operation only in June 1945 it is yet too early to achieve the desired effect but in the breeding trials at Nawagam promising progenies selected from the improved local varieties hold out future promise as regards yield.

(c) *Hyderabad scheme*: This scheme commenced in April 1944 with the object of evolving high yielding late maturing strains of paddy possessing good cooking and milling qualities. Work is in progress.

(d) *Travancore scheme*: This scheme started functioning in October 1940 for increasing the yield of paddy crop in the State. Three promising strains of the broadcast type at Adoor Farm proved to be the best yielders and the seeds of these are under multiplication. Of the transplanted type six strains proved superior and these are also being multiplied at farms of registered growers. The Russian varieties tested proved inferior to the local in yield.

Rice diseases.

Investigations on two important deceases of rice which are responsible for considerable annual loss of yield in Madras Province began in July 1943. They are:

(a) 'Blast' disease caused by the fungus *Piricularia*.

(b) 'Root-rot' disease caused by the fungus *Fusarium*.

The scheme aims at devising suitable methods of controlling the two diseases, such as the utilization of resistant varieties and the use of fungicides which will reduce the loss in rice production.

(a) '*Blast*' disease: The resistance of 300 varieties of rice to 'blast' was evaluated by growing them under conditions favourable for the spread of infection. They were further subjected to artificial inoculation under controlled conditions. The factors responsible for disease resistance in rice were studied when it was revealed that the number of silicated epidermal cells per unit area was greater in the resistant types than in the susceptible ones.

(b) '*Root-rot*': Two strains (G. E. B. 24 and Ptb. 7) proved highly resistant to this disease.

Trials with four fungicides (Certosan, Atiran, Ceresan and Agrosan) revealed that though all of them were effective in controlling the disease to a certain extent, the latter two were better. The dosage used was 1 gm. of the fungicide for one pound of seed.

Rice pest:

The bionomies, alternate host plant and control measures of two major insect pests of rice in Bengal, viz. Rice hispa and Rice stem-borer which cause considerable damage to the rice crop were studied in a scheme from March 1944.

In addition to this, a general survey of all the important pests of paddy throughout Bengal was also made. These included grass-hoppers, army-worm, cut-worm and mealy bugs.

The stem-borers completed their life-cycle on rice crops in those parts of Bengal where a summer crop is grown but had to pass on to an alternative host plant in regions where 'boro' summer crop was not raised.

The rice hispa found an alternative host in many wild grasses in Bengal. Of the insecticides tried to control this pest. Gammaxene and D. D. T. were found to be more effective than either Paris green or the arsenates of lead and calcium.

Rice manuring.

A notion is widely prevalent that the continuous application of sulphate of ammonia to the same land year after year may result in a deterioration both of crop yield as well as soil fertility. In order to find out if this is true and to determine whether the application of lime or organic manure in conjunction with the chemical fertiliser would obviate the deleterious effect, a scheme was started in Bengal in June 1945, the experiments being located at three different centres viz. Dacca, Chinsura and Rajshahi Farms. The results obtained during the 1946–47 season have given the following indications which have to be corroborated by trials in subsequent seasons before definite conclusions could be drawn.

At Dacca Farm the application of ammonium sulphate alone did not produce any significant effect on the yield of paddy grain but in conjunction with lime, it gave significantly increased yields. But similar results were not obtained at the other two experimental centres. The application of ammonium sulphate alone at Chinsura and Rajshahi Farms resulted in highly significant increase in yield of grain but the addition of lime did not produce any better effect.

The manurial requirements of rice were also studied under the Rice Research Scheme in Kashmir to which reference has already been made. The application of nitrogen in the form of ammonium sulphate at 30 and 60 lb. of nitrogen per acre gave 6 and 18 per cent more yields respectively. Sulphate of potash at 60 and 80 per cent per acre was able to increase the yield by 5 and 6 per cent respectively. Higher yields were obtained by the application of ammonium sulphate in conjunction with organic manure than with organic manure along or no manure at all. The application of rape oilcake at the rate of 20, 40 and 60 lb. of nitrogen per acre resulted in increased yields of 5, 26 and 36 per cent respectively. But their use is not profitable owing to the high price of oilcakes in Kashmir. The farmyard manure at the rate of 180 lb. of nitrogen per acre gave 29 per cent more yield and Rs. 49 net profit per acre over the minimum dose of 60 lb. of nitrogen per acre.

The Rice Research Scheme in Hyderabad has also been conducting manurial experiments with a view to study the effect of application of notrogen, phosphorus and potash in increasing yields. Bulk organic manures such as castor cake, ground-nut cake and farmyard compost were also included in the trials. Work is in progress and further result have to be awaited......

(Indian Farming)

ഇൻഡ്യൻ നെൽകൃഷി ഗവേഷണ പദ്ധതിക്കാർ ചെയ്ത പരിശോധനകളേയും അവയുടെ ഫലങ്ങളേയും പററിയുള്ള ഒരു ലേഖനമാണിതു്. പ്രധാനമായി കാഷ്മീർ, ബോംബെ, ഹൈദരബാദ്, തിരുവിതാംകൂർ എന്നീ നാലു പ്രധാന കേന്ദ്രങ്ങളിലാണു് പരീക്ഷണങ്ങൾ നടത്തിയിട്ടുള്ളതു്. കാഷ്മീരിൽ 7000—9000 അടി പൊക്കത്തിൽ പയർവർഗ്ഗങ്ങൾ വളരാത്തിടത്തു് നെല്ല നന്നായി വളരുമെന്നു കണ്ടുപിടിച്ചു. മററു സ്ഥലങ്ങളിൽ അമോണിയം സൾഫേററും, കുമ്മായവും കൂടി പ്രയോഗിച്ചു് വിളവു് വളരെ പുഷ്ടിപ്പെടുത്താമെന്നു് കണ്ടറിഞ്ഞു.

THE POTATO BLIGHT

(BLAME NOT CHEMICAL FERTILISERS!)

By

T. S. RAMAKRISHNAN, B.Sc. Ag.,

(AGRICULTURAL CHEMIST, FACT LTD., ALWAYE.)

ONE of the important charges that the antifertiliser school of thought fires against chemical fertilisers is that their use lowers the capacity of the plants to stand against diseases and insect attacks. Sir Albert Howard and Lady Eve Balfour in their books "*Agricultural Testament*" *and* "*The Living Soil*" dilate upon this accusation with an endless amount of details. They have used their word-power so effectively indeed, that a casual reader of these two books may probably arrive at the plausible conclusion that all ills both plant and human, are the direct cause of chemical fertilisers. Sri J. C. Kumarappa also makes mention of this particular charge in his article "Manures & Food" in the Gram Udyog Patrika.

To answer this point I should quote from famous agricultural scientists, who have carried out numerous experiments with fertilisers and who have recorded their observations in voluminous publications. In fact it will be very easy to do so. All such evidence is directly based upon actual experimentation on the field conducted through a long period—conducted too, by men who are experts in that line and who have the greatest regard for their professional reputation.

But in this article I am going to confine myself strictly to one simple line of argument. The antifertiliser or the pro-humus school says in a dogmatic manner that plant diseases have been on the upgrade since the advent of artificial manures. They condemn the chemical sprays by saying that the latter have been the invariable outcome of the large scale use of fertilisers. "You use fertilisers and the disease becomes more virulent and just to check its progress the modern scientist has, by way of necessity, invented the poison spray. If fertilisers are not used, no chemical spray will be needed." This, in a nutshell is their argument.

The pro-humus school goes still further and even condemns the present modus-operandi of agricultural research. They say it is based on the study of ill health and not on health. Modern plant pathologists study in detail all the diseases of plants, the organisms that cause such ailments, and their remedial measures. Their study, though based on ill-health, really involves the study of healthy specimens, for, how can one diagnose a disease, if he does not know the signs of perfect health? When a patient goes to a doctor with some ailment in his body, what he wants and what he expects from his doctor is immediate relief from pain. He won't be satisfied if the doctor gives him a long-winded lecture on how he could have avoided that disease. Such a lecture will of course be helpful in future, but just then what he needs is a prescription and not a lecture on prevention. No one can say that a study of diseases and finding ways and means to combat them is unsound research.

Now, to come back to the topic on hand, if according to the antifertiliser school, plant diseases have been on the increase since the coming of fertilisers, then it naturally follows, they must have been very rare prior to the fertiliser era. At that time only dung and compost had been used and the plants should have been highly resistant to diseases and no serious attack should have occurred at least on epidemic proportions.

But we will presently see that this has not been the case. For the purpose of illustration let us take the example of the deadly disease, the potato blight. This particular ailment is caused by a fungus, *(Alternaria Solani)* and in the year 1845 this vicious organism found the climatic conditions so favourable for its multiplication that it invaded nearly all the countries of Europe. All the cultivated varieties of potato were attacked and the disease spread from nation to nation at an alarming rate of speed. Countries like England, Ireland, France, Belgium, Poland, Germany etc.—all suffered and their standing crops simply withered and died out. Alarming reports poured forth from every corner of the continent of Europe and farmers were in despair. Millions of men had to starve and die. No one at that time knew anything about this disease and no control measure was there to adopt. Death marched onwards mercilessly. Various expert committees and commissions were formed to study this disease and to devise some sort of remedial measure—but to no avail. They could not do anything.

Peel in England called for the immediate repeal of the Corn Laws, with a view to import some extra food from abroad. Next year, 1846 witnessed yet another invasion of this fungus and once again people all over Europe had to face starvation and death. Conditions in Ireland were particularly awful and people died out in hundreds and thousands. Thus, this tiny fungus had turned out to be the worst enemy of mankind and Man had no weapons in his armoury to combat it.

Years rolled on. The disease made its appearance again and again and took its heavy toll in human lives. This particular period is referred to as the "*Hungry Forties*" by historians—a suitable name indeed! But fortunately the disease was not uniformly virulent all through the years. It became aggravated only when the climatic conditions were favourable for the multiplication of the fungal spores. The disease was ultimately conquered by the discovery of the Boardeaux Mixture towards the end of that century. Now we are no longer afraid of this deadly fungus. Let it come, we say, we are ready for it. The copper spray that we have, will kill it and the attack can be nipped in the bud. Armed with this fungicide man can confidently hope that never again will this fungus be allowed to invade nations and kill millions.

Now, the point here that is of importance to our argument is that this deadly disease occurred in such epidemic proportions at a time when no one had thought about fertilisers. Only dung and compost and nothing else was being used in farming. The crops should have been highly resistant to fungal attack. But no, they were not.

It is true that Liebig, the famous German scientist (who can be fitly called the Father of Fertilisers) was in the year 1840 just thinking about chemical plant nutrients. He was engaged in analysing various plants and finding out what exactly they took from the soil as food. Lawes in England was just starting to manufacture superphosphate in 1845. But I am sure no one can truthfully claim that chemical fertilisers were largely employed during that period. And yet the crops succumbed and that too on continental scale.

This will make us realise the fact that plant diseases are not simple problems that can be explained away by the anti-fertiliser thesis. Of course the capacity of living organism, plant or animal, directly depends upon the adequacy of the different foods it is able to produce for itself. The NPK supply must be ample—particularly the potash. But food is not the only criterion. Nature has to co-operate with man—but unfortunately for us humans, this is not always the case. When conditions of climate become unfavourable to us and favourable to the pest, the latter increases in a formidable manner and even the best-fed crop will not fail to succumb. That there was, is, and will be plant diseases, as long as there is farming on this globe, is an indisputable fact. Man out of necessity, and sometimes out of sheer despair, has to think out and devise means of exterminating such pests and this he is gradually doing. He has now armed himself with various insecticides and fungicides to combat against his enemies. His lot forces him to battle against Nature.

Another point that assumes importance in this context is the coming into use of chemical sprays. The pro-humus school says that these sprays are the natural outcome of the use of fertilisers. A little thinking will convince one how unsound this argument is. During those Hungry Forties the dying population would have welcomed the discovery of Bordeaux mixture. If only this fungicide had been invented during that awful period it would certainly have been used on a very large scale. Billions of gallons would have been manufactured and consumed. The reason why it was not used, was just because it was not available then. It was thus only a case of historical accident. Under the circumstances, to say that the advent of the spray is by necessity linked with the use of fertilisers is, to say the least, farfetched and highly unsound.

*Summing up, the following conclusions may be emphasized:—

(1) Humus is an important plant nutrient and soil improver but at the same time because of its inadequacy for all our farmlands it has to be reinforced by concentrated fertilisers.

(2) Fertilisers supply all the three NPK–nutrients and hence their use instead of lowering the disease-resistance of plants will in fact enhance the same. Modern research on minor plant nutrients has revealed that some of the plant diseases are caused by deficiencies of these minor nutrients and that such diseases can be effectively cured by supplying them.

(3) Though susceptibility to diseases is caused by soil deficiencies and the consequent mal-nutrition of plants, yet adequate nutrition also will not give perfect immunity. There are factors, that cannot be controlled by Man, which may generate diseases on epidemic proportions.

(4) Man has then to rely on artificial methods to battle against such outbreaks.

ഉരുളക്കിഴങ്ങുകൃഷിയെ നിശ്ശേഷം നശിപ്പിക്കുന്ന "ബ്ലൈററ്" എന്ന സസ്യരോഗവും അതിൻെറ നിവാരണമാർഗ്ഗങ്ങളുമാണ് ഈ ലേഖനത്തിൽ വിവരിക്കുന്നതു്. രാസവളങ്ങൾ ഉപയോഗിക്കാൻ തുടങ്ങിയതിനുശേഷം സസ്യരോഗങ്ങൾ വളരെ വർദ്ധിച്ചിരിക്കുന്നു എന്ന വാദത്തെ ശ്രീ. ടി. എസ്. രാമകൃഷ്ണൻ ഇതിൽ സയുക്തികം ഖണ്ഡിച്ചിരിക്കുന്നു.

Another Verse

Teacher: "Quote a Scripture verse."
Pupil: "Judas went out into the garden and hanged himself."
Teacher: "That's fine. Quote another."
Pupil: "Go ye and do likewise."

***REFERENCE:— HOPKINS—"Chemicals, Humus and the Soil."**

SUBSIDIARY FOODS

Sir SRI RAM'S OBSERVATIONS.

Better Nutrition and conservation of Foreign Exchange.

"IN the light of the present food shortage in the country, and our dependence on costly food imports from abroad, it is very desirable to pay more attention to subsidiary foods which have been eaten in the past in India and which are consumed even to-day" said Sir Sri Ram, Vice-Chairman, Subsidiary Food Production Committee, addressing a Press Conference a few days back. He said that the use of subsidiary foods as a part of the Indian diet should have been popularized long ago, but because of the present overall deficit in cereals in the country, such a step had now become absolutely necessary.

Sir Sri Ram explained that the Subsidiary Food Production Committee aimed not only at improving the nutritional standard of the people, which admittedly was very low, but also to save the country's foreign exchange earnings.

For the present the Committee was concentrating its efforts on increasing the production of two items i. e. sweet potatoes and tapioca which would give quick results and the use of groundnut cake which is readily available. The two non-cereal foods give a considerably higher calorie yield per acre than rice and wheat.

From the point of view of value 5 to 10 per cent of the cereals are used for seed, while in the case of tapioca and sweet potatoes, they are grown from cuttings and vines. In respect of protein yield, the sweet potato and the tapioca are however inferior to cereals.

Quality of Indian Diets.

Although India is deficient in the production of the total quantity of foodgrains required to feed her people, she suffers to a far greater degree in respect of the quality of the diet. In terms of food factors, the most important deficiencies are those of protein of high biological value fat, vitamins A and B; and calcium. An admixture of a small percentage of sweet potato flour with wheat flour (atta), will stretch wheat supplies, but will also slightly lower the nutritional value of the atta. It is necessary, therefore to fortify it with some food rich in proteins.

Groundnut Cake.

Luckly for India, it produces a large quantity of groundnut cake which is rich in protein, contains a useful percentage of fat as also salts and vitamins. Groundnuts either raw, cooked or roasted have been used in India for a long time. Roasted they are widely used throughout the country and are popular. But their high oil content prevents their use in larger quantities than perhaps an ounce a day. Experiments conducted in different centres show that defatted groundnut cake—cake from which the oil content has been reduced to a minimum, providing proteins and vitamins,—when crushed into fine flour, can be mixed with atta and incorporated into the national diet with beneficial results. In the case of rice diets, the groundnut cake flour can be used as an ingredient of cooked dal or mixed with curries of the semi-dry type. The defatted groundnut cake can also be used with gur or sugar as a sweetening agent in the manufacture of toffee or biscuits.

At present groundnut cake is largely used as manure and cattle feed. In these forms it does not however give the maximum results which it would, if used as human food. Plants need nitrogen which they can secure from chemical fertilizers and organic manures. The use of an edible protein like groundnut cake as manure increases the yield of rice or wheat, which however contains less protein than the cake which has been ploughed into the field. The fat content of groundnut cake which is a useful addition to the Indian diet is however completely lost when it is used as a manure. Groundnut cake given to milch cattle, increases the milk yield, but it does not produce any corresponding increases in milk protein. Increased milk yields can be achieved through giving the cattle, cottonseed and other products, which are not consumed by human beings.

Groundnut cake commercially produced at present and sold in the bazaar, is ordinarily unfit for human consumption. As the utility of groundnut cake in supplementing the Indian diet has been established, steps are being taken to have the cake produced from nuts which are hand-picked and graded. Steps will also be taken to ensure that nut cake flour of the highest quality and purity, and well-ground, will be mixed with atta in the right proportion.

The Subsidiary Food Production Committee has already asked a committee of scientists to conduct further experiments and report within the next few weeks, on the suitability or otherwise of groundnut cake flour as human food, and the proportion in which it could be included in the atta.

Medical Opinion.

The opinions of some of the well known medical authorities in India are as follows:—

Dr. Jivaraj Mehta—"I agree about the utility of groundnut cake in supplementing our dietary. As a matter of fact along-side with groundnut cake, should also be thought of, oil-seed cake, copra cake etc. All these are rich in protein..... ...."

Dr. K. C. K. E. Raja—"The use of groundnut cake as human food is a very good idea, and seems particularly attractive from the dual stand-point of making up the shortage of food, as well as of providing proteins and vitamins, which are deficient in the normal Indian diet."

Dr. V. N. Patwardhan—"I am in entire agreement with the suggestions on the consumption of groundnut cake...........The immediate step that one can take is to improve the conditions of pressing the oil out of groundnut, in order to get a cake suitable for human consumption."

Dr. Albert Siemions. "The chemical analysis of groundnut oil cake shows that it is richer in protein than any other vegetable substance and this protein is edible............... The most important vitamin deficiency in India is of the B complex. Groundnut cake has been proved to be very rich in the vitamin B complex, particularly in vitamin B and nicotinic acid which are the most important factors."

India, produces about 3½ million tons of groundnut which will yield 20 lakh tons of the finest food. That means 10 lakh tons of high grade protein equivalent in protein value to over 1400 million or 2400 million gallons of milk. Groundnut cake is therefore not a food which is a substitute, nor a food to tide over a temporary crisis, but one which if generally accepted as a regular item of diet, will not only curtail India's expenditure on imported foodgrains, but also improve the national health.

(Indian Spectator.)

"ഇപ്പോൾ ഭക്ഷ്യമായി ഉപയോഗിക്ക പതിവില്ലാത്ത ചില സാധനങ്ങൾകൂടി നമ്മുടെ ആഹാരത്തിലുൾപ്പെടുത്തേണ്ടതു് നമ്മുടെ ഭക്ഷ്യ സ്വയം പര്യാപ്തതയ്ക്കു് അത്യാവശ്യമാണു്. നിലക്കടലപ്പിണ്ണാക്കു് അത്തരമൊരു വസ്തുവാണു്. അതിലെ പോഷകാംശങ്ങളെക്കുറിച്ചു് ഗവേഷണം നടത്തിയ വിദഗ്ദ്ധ ഡാക്ടറന്മാർ അതിലെ ഒന്നാംകിടയിലുള്ള ഒരു ഉപഭക്ഷ്യമായി സ്വീകരിക്കാമെന്നു വിധിച്ചിട്ടുണ്ടു്! ഈ ലേഖനത്തിൽ, ഇൻഡ്യാഗവമ്മെൻറു് ഉപഭക്ഷ്യോല്പാദകസമിതി ഉപാദ്ധ്യക്ഷനായ സർ ശ്രീറാം ഇങ്ങനെയാണു് അഭിപ്രായപ്പെട്ടിരിക്കുന്നതു്.

Mental Health Plan

Three suggestions about ways to maintain mental health:

First, accept the reality that life is a struggle. It requires continuous adjustment both within ourselves, and between ourselves and the rest of the world.

Second, if we are going to survive that struggle we have to find security in our environment. That means we have to learn how to balance the emotional stresses against the emotional supports.

Third, we have to find satisfaction, fun and happiness if we are going to stay healthy.

Dr. William Meninger and Munro Leaf.

FACTS THAT INTEREST

THE NEW ATOMIC CLOCK.

Recent news flashes announce that Dr. Harold Lyons of the National Bureau of standards U. S. A. has invented the atomic clock as if to confirm the general cry that the present is the atomic era.

Since early times man has striven hard to find fixed invariable standards against which he could measure time. Being freely suspended in space and devoid of material friction the earth has so far provided us with such a standard i.e. its period of rotation around itself, which was defined as a day. From the days of the hour-glass all improvements like clocks and watches were meant to measure fractions of this "day" in hours, minutes and seconds. The accuracy of these instruments however was liable to be affected by surrounding conditions, The correctness of a pendulum clock depends on the constancy of the length of its pendulum. We know that due to expansion, the length of the pendulum in summer is different from that in winter. The errors in measurement of time, however small, could always be traced to the instruments. In spite of the apparent perfection reached in the art of making timepieces, the grave doubts that prevailed regarding the inconstancy of the earth's period of rotation could not be resolved.

Clocks are instruments that count the number of swings of some oscillating or vibrating object. In the case of the modern atomic clock the vibrating objects are the atoms, which in combination form molecules, the building blocks of all matter. The inventer Dr. Lyons used the molecules of ammonia, the pungent smelling gas that is used in some of our refrigerators, for this purpose. Research on the absorption of a type of radio waves by this gas is what led the scientists to believe that inside the ammonia molecule could be found the invariable standard for which they had looked up to the heavens in vain. They found that it absorbed one and only one particular frequency out of a whole band of these radio waves called microwaves. This was because inside the molecule sheltered against changes in outside conditions like temperature and pressure, the atoms led a merry cloistered dance beating out the rhythm with uncanny regularity. The clock built around this invariable molecular system proved to be so accurate that the variations in the apparently constant period of rotation of the earth could be measured clearly. Tidal friction in shallow seas is slowing down the earth and there are other irregular variations, in the period for as yet unknown reasons. All these however are of an extremely minute order.

The actual clock is a maze of electronic devices occupying the volume of a rather large book shelf. It required some of America's leading radio engineers to build it. In electronic engineering the new clock will be used as an unparallelled frequency standard. Your kitchen clock perhaps ticks twice a second but the little nitrogen heart of this new timekeeper beats out time at the amazing rate or 25,000 million times per second.........

NEWSPAPER BY RADIO.

Latest developments on the transmission of pictures and printed matter by radio, justify one in surmising that the news-paper of tomorrow will be delivered not by rail or air, but literally by wireless. Powerful radio transmitters might be installed at the Presses. In the early hours of the morning, they would start broadcasting like any other radio station, with the only difference that instead of speech and music they would sent out wireless waves corresponding to light and shade on each portion of the news-sheet as it is systematically searched or scanned by an electric eye.

The heart or rather the eye of the transmitter is a little electronic device called a photo-cell which is also used in cinema projectors, burglar alarms and many other instruments. It converts the changes in brightness of the light falling on its surface into changes in an electric current passing through it. The variation in the current can be sent through wires as is being done for picture transmission over short distances. They can also be broadcast over the air which is how we get some of our newspictures of events abroad very speedily.

At home, if you are a subscriber, you would have tuned your radio set to the particular station and connected the picture re-producer or fascimile receiver to the radio set before going to bed. At 3 or 4 A. M. a relay like an alarm clock, would automatically switch your radio set on, and the roll of reproducing paper on the fascimile receiver would begin to get "printed". To read the morning paper with your early cup of coffee, all you have to do would be to go to the radio set, and tear off the very latest news, complete with pictures, cartoons and of course the usual advertisements.

Fascimile transmission has been done for a long time, but only in the past two or three years has speed and accuracy on a practical basis been achieved. J. V. L. Hogan in the United States developed a new system which was demonstrated as early as 1946. By this system copy can be produced at the rate of 250 words per minute which is faster than the average reading speed.

At the receiving end the original is reproduced by one of several methods using a photographic paper or a chemically treated paper.

High speed facsimile transmission has many and diverse uses and this is but the beginning...... ..

(Science News Service.)

IMPROVED TYPE OF PLOUGH.

The Indian Agricultural Research Institute has evolved a new plough which with a single pair of bullocks, is capable of doing twice the work done by the existing standard plough.

The new plough is simple in construction and consists of two standard "desi" plough, suitably coupled by an ironframe-work and pulled by a single central beam. The ploughs are so spaced that identical furrows are cut and they carry out in one operation the work which would be performed in two operations, by the standard plough. The plough is comparatively light; its weight being only 50 per cent heavier than the standard plough. Trials show that the draught did not exceed 260 lbs. as against the normal draught of 155 lbs. of a standard plough. The additional draught of the new plough is not likely to be heavy for bullocks as experience has shown that so far as ploughing is concerned bullocks are usually underloaded.

The quality of ploughing is also improved. Seasoned ploughmen who have used the new plough are enthusiastic about it and state that it is easier and less tiresome to operate due to its stability.

Besides its simplicity in construction, the new plough is comparatively economical, its cost being only about 50 per cent more than the standard plough. It can be easily repaired and fabricated.

SOIL CLASSIFICATION IN U.S.A.

The system of soil classification developed through years of research and now used throughout the United States makes it possible to apply techniques of modern agricultural science to individual farms according to a report of the U. S. Department of Agriculture.

Because soils differ widely within any area, the success of the application of new research findings on a given farm cannot be predicted accurately unless soils at the research station and at the farm are classified in terms that permit comparison.

On the basis of field and laboratory experiment, conducted during 1912 to 1935, a new concept has been formulated. The process of soil formation in different environment, are so unlike that soils developed from similar rocks in different places have widely different characteristics and behaviour.

In defining soil types the characteristics taken into consideration are surface slope, texture, stoniness, fertility, depth, drainage, acidity and presence of impervious layers.

More than 8000 different soil types have been identified. In soil survey reports the different types in a particular area, usually a single country, are classified, shown on maps, and described. A sandy loam is described as a poorly drained, acid, sandy soil, with no layers that cannot be penetrated by water and plant root. It requires drainage to lower the water table, is deficient in plant nutrients, and needs heavy fertilization to produce high yields of most crops.

Such classification furnishes an accurate and orderly basis for assembling in usable terms the results of research and the experience of farmers. It permits prediction of crop adaptability, probable yields, and management requirements of specific areas of land. Experimental results or farmer's experience with one type of soil may have little or no predictional value for other soil types. Soil classification provides a means of showing the types of soil on any piece of property so that farmers may choose used practices that experience of research has shown to be suitable to these soil types. It has played a major role in the development of programmes for soil improvement and conservation and for the prompt and effective adjustment of agriculture to meet fluctuating economic conditions and emergencies.

INDIA TO ERECT DRUG PLANT IN NEAR FUTURE.

Design and construction of the long discussed Pencillin and anti-malarial factory in Bombay finally has been entrusted to the Swedish firm of Karnbolaget by the India Government. The plant is expected to take three years to construct and to cost roughly $6 million when finished.

The agreement is reported to call for the following annual capacities:—

Pencillin	...	1,200 million Oxford units.
Antimalarials	...	100,000 lb.
Sulphameraline	...	60,000 lb.
Sulphathiazole	...	20,000 lb.
Sulphanilamide	...	20,000 lb.

When completed the plant is to be run by Indian nationals, trained during construction period.

(*Chemical Engineering*)

Shaw's Dream of Heaven

"On very rare occasions," declared Bernard Shaw in an interview to the *Evening Standard*, "once in 15 years or so, I dream I am in a state of extra-ordinary happiness in an immense landscape, with great structures of latticed steel like the Forth Bridge visible. This is my dream of heaven."

In his own experience he had found no conclusive evidence that dreams were sometimes premonitions. "Freud," he said, "counts for nothing with me. His interpretations of all dreams as sexual were too far-fetched to be taken seriously".—Globe.

NEWS & NOTES

Indian standards institution (ISI).

Draft Indian Standard Acetons.

Acetone is an important raw material in the manufacture of propellant explosives. At the suggestion of the Central Standards Office for Railways and the Directorate General of Civil Aviation, the Sectional Committee on Heavy Chemicals (Organic) (CDC 2) of the ISI has drawn up a draft standard for acetone. This standard lays down the physical and chemical characteristics, the methods of sampling and test, and packaging and marking of acetone. Eight appendices are provided which deal with the methods of test stipulated for the product of the quality specified in this standard.

In accordance with the procedure of the Indian Standards Institution, every draft specification or code prepared by a sectional committee, is to be issued in proof form for a period to be determined by the committee but not less than three months, and widely circulated amongst those likely to be interested, for the purpose of securing critical review and suggestions for improvement. Comments received from all quarters shall be given due consideration by the sectional committee; and the revised final draft will then be placed before the Chemical Division Council for endorsement. Before being finally accepted as an Indian Standard it must be approved by the Executive Committee and the General Council of the Institution.

The draft is being circulated among interested parties for purposes of comment and suggestion. Comments will be received up to 7th October 1949 by the Director, Indian Standards Institution, Block 11, Old Secretariat. Delhi—2.

Research on wheat rust.

India Govt. Sanction scheme.

A research scheme on wheat rust will be undertaken on an All-India basis by the Ministry of Agriculture, Government of India, as recommended by the Wheat Rust Control Committee appointed in 1947 by Dr. Rajendra Prasad, the then Food Minister.

A sum of Rs. 8,58,300 has been sanctioned for the research for a period of five years beginning from April this year.

The research scheme, it is stated, aims at evolving a type of wheat which is simultaneously resistant to all kinds of rust. It will also deal with the botanical, mycological and agronomical aspects of the problem.

Rust, which is caused by a parasitic fungus, is said to be responsible for considerable damage to crops in all cereal growing countries of the world.

In India, it is pointed out, the problem is more difficult and complex than in other countries as here all the three kinds of rust, namely, black, brown and yellow are prevalent. The Central Provinces, it is estimated, lost about two million tons of wheat in 1946-47 as a result of a black rust epidemic. — P. T. I.

India Govt's Major Industrial plans.

Good Progress Reported.

Good progress has been made in finalising eight of the Central

Government's major industrial plans, according to a memorandum submitted by the Ministry of Industry and Supply to the Central Advisory Council of Industries.

Agreement with foreign firms for technical advice is expected to be concluded as regards three industries, while project reports are expected to be received soon by Government from experts contracted for the purposes. The details of two other schemes are being worked out. The expert report dealing with the ship-building project is now under consideration of the Government.

An agreement is expected to be concluded shortly with a leading firm of international reputation for giving technical advice in the establishment of a dry core paper insulated telephone cadles factory. It is hoped that the factory will start production within about a year.

The annual requirements of telephone cables of the Posts and Telegraph Department for the next ten years would be of the value of Rs. 70.31 lakhs net and there after not less than Rs. 50 lakhs. In view of the huge demand and also with the idea of making India self-sufficient in this vital industry, Government have decided to establish the factory.

MACHINE TOOL FACTORY.

An agreement has been reached with the Oerlikons of Switzerland for setting up a machine tool factory in India. Technical representatives of the firm are expected to arrive in India shortly. The capital cost of the project is estimated at Rs. 12 crores and it will be carried out within a period of four to five years. The annual production of the factory is expected to be of the value of Rs. 7 to 8 crores.

The Government of India are exploring the possibility of establishing a state-owned factory in India for manufacture of diesel engines at a total estimated cost of Rs. 10 crores. Negotiations are at present going on with Dr. Carp of the Steyr Works, Australia, regarding his terms for the preparation of a project report for the establishment of the factory and the setting up of a machine tool repair shop. The offer received in this regard from an Italian firm is also under consideration. India will require 5,000 diesel engines annually for the next five years and this figure would go up considerably with the use of tractors in agriculture and speeding up of road and sea transport.

The project reports on heavy electrical plant manufacturing factory are expected to be ready by September, while the preparation of the reports on the establishment of a factory for the manufacture of radio equipment and radar would take about six months.

The report of the French experts assessing the value to be paid to the Scindia Steam Navigation Company for taking over the ship-building yard in Vizagapatam and also in regard to the establishment of a new ship-yard is now under examination of Government.

Steps are already being taken towards the establishment of the factory for production of penicillin, sulpha drugs and antimalarials at an early date. Pending the establishment of the statutory corporation, which would run the industry, a committee of management consisting of representatives of the Governments of India and Bombay has been appointed. The committee met recently to discuss the preliminaries.

Details of a scheme for the establishment of a state factory for the manufacture of tractors are being worked out.—

Food value of tea.

Research shows 80 p. c. Vitamin content.

The annual report of the Board of the Tea Research Institute of Ceylon for 1947 says that a food investigation in the United Kingdom during the war showed that tea was a considerable source of Riboflavin (Vitamin B 2), which made a valuable contribution to the balance of diet among certain classes of workers.

It is estimated that 80 per cent of the Vitamin in the dry leaf passes into the cup when the tea is brewed in a teapot. Teas which had been stored for a year, it is stated, showed practically the same content as fresh teas. The Vitamin inherent in the tea leaf is, therefore, available in the beverage as consumed.

Rimless spects may cause skin cancer.

Rimless glasses may be a cause of skin cancer near the eyes, medical experts reported recently.

Rimless spectacles focus light on the face and may allow certain heat or chemical rays to be conducted to the skin, they said.

The findings were reported by four doctors from the Dermatology Department of Jefferson Medical College, Philadelphia. The doctors said the findings were not conclusive.

Twelve cases of skin conditions believed caused in this way were described by doctors Henry B. Decker, Edward F. Corson. George M. Knoll and Herbert A. Luscombe in the American Medical Association's archives of dermatology and syphilology. Nine of the 12 patients had skin conditions diagnosed as cancer, and another was suffering from Keratoses, a premalignant growth caused by radiation. The other two had chronic actinic dermatitis a skin disturbance caused by light rays.

The doctors said certain types of spectacle frames, the rimless or partly rimless kind, appeared especially responsible for the condition. The clear glass rims apparently allowed light to pass through and focus on skin below the eyes, causing irritation.

The doctors offered one solution. A lacquer can be put on the edges of the rims to block off completely the rays believed to be harmful. —

Oil from a weed.

Lord Hankey told the House of Lords that conophor oil, the substitute for linseed oil obtained from a West African weed, has "very great promise."

"It has advanced greatly," he said, but they had still to prove they could grow the weed as a crop.

Question Box

(In this section answers are given by our Agricultural Chemist to questions received from the public on Soil, Agriculture and use of Fertilisers)

Question No. 51:—

I find that small insects resembling bugs are destroying the earheads of my cholam crop. Will you please inform me as to what control measures I may adopt to put a stop to this attack ?

From R. K. N., Coimbatore.

Answer:—

From the details mentioned in your letter regarding the size and colour of the insects and the nature of the damage they cause, I think that the insect must be none other than the cholam Earhead Bug, whose entomological name is *Calocoris angustatus*. This particular insect is indeed a very serious pest of the cholam (Sorghum or Jowar) crop and it occurs in almost all the regions where cholam is cultivated. If unchecked it is quite capable of causing great damage to the crop. This bug possesses long, tubular mouth parts, with which it pierces the tender grains and sucks out the milky sap within. Under favourable conditions these insects multiply enormously and because of the heavy drain of the milky juice within the grains, the ultimate grain yield is appreciably reduced. Either grains do not develop at all or even if developed they remain only partially filled. The quality of the grain is also lowered.

As for control measures it has to be emphasized that the attack of this insect can be successfully checked only if the measures are taken in the initial stage. Once the bug gets established on the crop it will become nearly impossible to destroy it completely. We can only hope to reduce the degree of damage. The best method to control this bug is to spray 1% solution of DDT wettable powder over the crop. It is advisable to spray the crop just when the earheads are appearing. Please try to locate the spots where the bugs seem to be most active and give special attention to those spots. If the spray is to be effective, you should use either a power sprayer or at least an ordinary stirrup pump with a nozzle attached to the hose. As prevention is better than cure, it will be preferable to give a protective spray to those areas that are unaffected but are adjacent to affected regions. For your information, I may add that this 1% DDT-solution has been found very effective against these bugs by the Madras Agricultural Department.

Question No. 52:—

I recently came across the term "spray irrigation" in a foreign journal. Can you inform me as to what it exactly means and how it should be carried out in a farm ?

From T. V. K., Trivandrum.

Answer:—

Ordinarily field irrigation is carried out only by surface-gravity—flow of water. The fields are divided into beds or furrows and the water is let into them from an irrigation channel. Thus we have two kinds of field irrigation, namely, bed-irrigation and furrow-irrigation. Of these two kinds the latter method will help to minimise the quantity of irrigation water used. The term *spray-irrigation* refers to a new method which is largely employed in the U. S. A. and is found to be more effective than the other forms of irrigation. According to this modern method water under pressure is let out through minute apertures made in a narrow iron pipe which is attached to the delivery end of a hose. This method is costly and can be used only in those farms where we have water flowing through pipes and not open channels. Since the water is forced out through small openings, it gushes out in the form of a fine mist. Because of the pressure the water ascends to some height and comes down gently in a cloud of minute droplets. Thus it may be realised that these artificial conditions approach very nearly those of natural rainfall. The droplets, as they ascend and descend through atmosphere, dissolve gases like oxygen, carbondioxide, etc. Scientific workers in U. S. A. have made repeated tests under strictly controlled conditions and they have come to the conclusion that spray irrigation is far more beneficial to crops than other forms of irrigation. In one particular series of experiments they found that furrow irrigation with tomato as field crop gave a yield of 6.1 tons per acre while spray irrigation under the same conditions was able to produce a yield of 10·1 tons per acre. (Reference—USIS Agricultural News letter, Feb. 1949.)

Question No. 53:-

I have some paddy fields on a high level. These fields are of low fertility and are not liable to flooding of water even under the heaviest showers. Because of the loose nature of the surface soil all the rainwater immediately drains out or percolates down. The crop is sickly yellow in colour. May I apply ammonium sulphate to this crop now ?

From M. M., Ellur.

Answer:—

Yes, you can. The present sickly yellow colour of the foliage will at once change to healthy dark green colour as soon as you have applied ammonium sulphate. But because of the peculiar conditions of your land I would request you to bear in mind the following points: (1) You should not apply a heavy dose of the fertiliser. Since you cannot insure maximum amount of moisture it is advisable to employ only a light dose (2) Before applying ammonium sulphate close up all the inlets and outlets of all the Kandams, with a view to see that all the rainwater that falls on different fields stays there. (3) For broadcasting the fertiliser choose a time when the surface soil is very moist. You can apply the fertiliser even during rains. (4) The important point is, the land should not dry up for at least 3 or 4 days after the application (5) For your land a medium dose of 60 to 75 lbs. of ammonium sulphate per acre will be adequate. (6) The crop should be at least a foot high when the sulphate is being applied. Then only the crop will be able to make the maximum use of the applied fertiliser.

Question No. 54:—

My cocoanut gardens are in a poor stage. The total yield of nuts is getting gradually reduced year by year. Most of the trees are not as healthy as they should be. Will you please inform me as to the most important precautions that have to be kept in mind regarding upkeep of cocoanut gardens in general.

From P. K. N., Alwaye.

Answer:—

Your letter does not give sufficient information about soil or other relevant conditions. So I am answering on general lines. There are various factors that have to be controlled if the garden is to be run with the maximum degree of efficiency. The instructions that have to be followed will naturally vary with the nature of soil and climate. Yet I give below some of the important matters which have to be borne in mind for increasing efficiency in cultivation. (1) The land selected for cocoanut garden should not be a low, water-logged one. It should have a well drained soil. If water-logging and excess of moisture is feared it will be advisable to dig long, deep trenches in between the rows of trees with a view to drain out all the water from the top soil. (2) If the land is highly sloping then it has to be terraced and bunded before the seedlings are planted (3) Only the best varieties of nuts should be selected for raising the seedlings. Well matured nuts from superior types of trees only should be selected for the purpose, as seedlings of doubtful quality and performance will result in a poor garden. (4) Proper spacing (at least 25') should be given for trees. Over-crowding will reduce production of nuts. (5) Proper and adequate manuring is essential. A mixed dose of 3 to 4 lbs. of ammonium sulphate, 4 to 6 lbs. of superphosphate, 20 lbs. of wood ash, 100 lbs. of organic manure like Farm Yard manure or leaf mould or river silt will be the best. This mixed dose is to be applied for each tree in the course of one year. If the land is acidic a dose of 3 to 5 lbs. of powdered slaked lime may be applied *first*. All these manures are to be applied in a circular trench dug around the base of the tree. Maximum production calls for generous manuring and unless the trees are well fed they cannot be expected to give out their best. Years of inadequate manuring have left their mark on most of our present cocoanut gardens and the latter are now suffering from various deficiency diseases. (6) It is better to interculti-vate the cocoanut gardens. A crop like horsegram or other pulses or even a green manure crop can be raised in between the trees. This method will not only benefit the owner by its produce but also protect the soil from losses by erosion and leaching. Intercultivating always keeps the gardens in a good condition. (7) Always be on the look-out for pests and diseases and take timely remedial measures. Unfortunately cocoanut is attacked by several insects and it also suffers from various fungal diseases. But modern science has come to the help of the farmer in devising suitable methods of control. These methods however, will be effective only when they are taken up promptly and without delay. I would even recommend that you may learn up all the available technical information regarding the kinds of the different pests and diseases along with their control measures. This information will greatly help you to diagnose a particular disease without any great delay. (8) Only fully matured nuts should be harvested, for such nuts alone can give the best quality copra.

T. S. Ramakrishnan,
Agricultural Chemist.

ഭക്ഷ്യ സ്വയംപര്യാപ്തത കൈവരുത്തുവാൻ പരമാവധി യത്നിക്കുക

ഗവർണ്ണർ ജനറൽ ശ്രീ. സി. രാജഗോപാലാചാരി രാഷ്ട്രത്തോടായി ചെയ്ത ഒരു പ്രക്ഷേപണപ്രസംഗത്തിൽ ഇപ്രകാരം പ്രസ്താവിച്ചിരിക്കുന്നു:—

ഒരു രാഷ്ട്രമെന്ന നിലയിൽ ജീവിക്കുവാനും, സ്വതന്ത്രരും പരിഷ്കൃതരുമായ ഒരു ജനതയെന്ന നിലയിൽ നമ്മുടെ മേന്മയെ തെളിയിക്കുവാനും നാം ആഗ്രഹിക്കുന്നുണ്ടെങ്കിൽ നാം നിവർന്നിരുന്നു് ഭക്ഷ്യദൗർലഭ്യത്തെപ്പററി നല്ലവണ്ണം ചിന്തിക്കുകയും സ്ഥിതിഗതികളെ നേരിടുന്നതിനാവശ്യമായതു് പ്രവർത്തിക്കുകയും ചെയ്യേണ്ടിയിരിക്കുന്നു. പണം അച്ചടിച്ചിറക്കാൻ സാധിക്കും. ഹ്രസ്വമായ അടിയന്തിര ഘട്ടങ്ങളിൽ അത്തരം അച്ചടിച്ച കടലാസുകൾ ഉപയോഗിച്ചു് ഉദ്യോഗങ്ങളിലിരിക്കുന്നവർക്കും തൊഴിലാളികൾക്കും ശമ്പളം കൊടുക്കാനും നമുക്കു കഴിയുന്നതാണു്. ഇങ്ങനെ അധികമുള്ള പണം അടിയന്തിരഘട്ടം കഴിയുമ്പോൾ ക്രമേണ പിൻവലിക്കുകയും സാധാരണ സ്ഥിതിഗതികൾ പുനസ്ഥാപിക്കുകയും ചെയ്യുന്നതിനും നമുക്കു് കഴിവുണ്ടു്. അധികമുള്ള പണം പ്രചാരത്തിലിരിക്കുന്നതുകൊണ്ടു് ആർക്കും പ്രയോജനമില്ല. നേരെമറിച്ചു് അവ വിലകൾ വർദ്ധിപ്പിക്കുകയാണു് ചെയ്യുന്നതു്. പണം ധനമല്ല. അതു കണക്കു കൂട്ടാനുള്ള ഒരു ഉപകരണവും സ്വത്തിന്റെ ചിഹ്നവും മാത്രമാണു്.

അന്യരാജ്യങ്ങളിൽനിന്നും നാം ഇറക്കുമതി ചെയ്യുന്ന സാധനങ്ങളുടെ വിലയ്ക്കു തുല്യമായി നമ്മുടെ രാജ്യത്തു് സാധനങ്ങൾ ഉല്പാദിപ്പിച്ചു് ആ രാജ്യങ്ങളിലേക്കു് കയററി അയയ്ക്കണം. ഈ ഇടപാടിൽ നമ്മുടെ സ്വന്തം കടലാസ്സുപണം ഉപയോഗയോഗ്യമല്ല. അന്യരാജ്യങ്ങളിൽനിന്നും കിട്ടുന്ന സാധനങ്ങൾക്കു് നാം ഉടനടി വില നല്കേണ്ടതാണു്. നമ്മുടെ വിദേശസ്വത്തുക്കൾ അത്രത്തോളം കാത്തിരിക്കുമെങ്കിൽ അടുത്ത വർഷമോ അതിനടുത്ത വർഷമോ കൊടുത്താലും മതിയാകും.

വ്യവസായങ്ങൾക്കുവേണ്ട യന്ത്രങ്ങളോ, ഉപയോഗത്തിനുള്ള സംസ്കൃതസാധനങ്ങളോ, വിശ്പ്പടക്കുവാനുള്ള ആഹാരസാധനങ്ങളോ നമുക്കു ലഭിക്കുമ്പോൾ എന്തെങ്കിലും സേവനങ്ങൾ നിർവ്വഹിച്ചോ അസംസ്കൃത സാധനങ്ങളോ, നിർമ്മിതസാധനങ്ങളോ, സ്വർണ്ണമോ, മററെന്തെങ്കിലും വിലയേറിയ ലോഹങ്ങളോ കൊടുത്തോ നാം അവക്കു് പകരം നല്കണം. ഇവയെല്ലാം വിദേശങ്ങളിൽ ആവശ്യവും അംഗീകാരയോഗ്യവുമായ രൂപത്തിലും വിധത്തിലും കയററി അയക്കേണ്ടിയിരിക്കുന്നു. ഈ വിധത്തിൽ വളരെയൊന്നും ഇന്ത്യയ്ക്കു കയററി അയയ്ക്കുവാൻ സാദ്ധ്യമല്ലെന്നുള്ളതു് പരക്കെ അറിവുള്ളതാണു്.

നമ്മുടെ ആളുകൾക്ക് മതിയാകുന്നത്ര ആഹാരസാധനങ്ങൾ പണ്ടൊരുകാലത്ത് നാം കൃഷിചെയ്ത് ഉണ്ടാക്കിയിരുന്നു. ചില അസംസ്കൃത സാധനങ്ങളും ചില്ലറ നിർമ്മിതസാധനങ്ങളും ഉല്പാദിപ്പിക്കുവാനും അന്നു നമുക്ക് കഴിയുമായിരുന്നു. ആ സാധനങ്ങൾക്ക് വിദേശരാജ്യങ്ങളിൽ നല്ല കമ്പോളങ്ങളുണ്ടായിരുന്നു. അതിനുപകരമായി ആ രാജ്യങ്ങളിൽനിന്നും നിർമ്മിതസാധനങ്ങൾ നാം ഇറക്കുമതി ചെയ്തുവന്നു.

ഇറക്കുമതി ചെയ്യുന്ന സാധനങ്ങളുടെ വിലയേക്കാൾ കൂടുതൽ വരത്തക്ക നിലയിൽ നാം അസംസ്കൃതസാധനങ്ങൾ കയററി അയയ്ക്കുന്നു. വളരെ അധികവും നിർമ്മിത സാധനങ്ങളും ഗണ്യമായ തോതിൽ ഭക്ഷ്യസാധനങ്ങളും നാം വിദേശങ്ങളിൽനിന്ന് ഇറക്കുമതി ചെയ്യുന്നുണ്ട്. ഇംഗ്ലണ്ടിലെ ബാങ്കിൽ നമ്മുടെ യുദ്ധകാലമിച്ചമായി ഉള്ള പണത്തെയാണ് നാം ഇതുവരെ ആശ്രയിച്ചുകൊണ്ടിരുന്നത്. തത്കാലത്തേക്ക് ഈ സമ്പ്രദായം കൊള്ളാമെന്നല്ലാതെ അത് എക്കാലവും നടക്കുകയില്ല. മററുള്ള എല്ലാ അധിക ഇറക്കുമതികളും നാം നിറുത്തലാക്കണം. തന്നത്താൻ നിറുത്തലാക്കിയില്ലെങ്കിൽ അത് താനെ നിന്നുകൊള്ളും. നമ്മുടെ കയററുമതിക്ക് തുല്യമാകത്തക്കവണ്ണം നമ്മുടെ ഇറക്കുമതി കുറവുചെയ്യേണ്ടതാണ്.”

ഗവർണ്ണർ ജനറൽ ഇപ്രകാരം തുടർന്നു:-

“നമുക്ക് ആവശ്യമായിട്ടുള്ള ആഹാരസാധനങ്ങൾ മുഴുവനും നാം ഉല്പാദിപ്പിക്കേണ്ടിയിരിക്കുന്നു. നമുക്ക് ആഹാരം കൂടാതെ കഴിയുക സാദ്ധ്യമല്ല. മററു പല സാധനങ്ങളും കൂടാതെ നമുക്ക് കഴിഞ്ഞുകൂടാം. പക്ഷെ ആഹാരത്തിൻെറ കാര്യം അങ്ങനെയല്ല. കനിവില്ലാത്ത ഒരു യജമാനനാണ് പ്രകൃതി.

പുതിയ സ്ഥലങ്ങളിൽ കൃഷിയിറക്കുന്നതിനുവേണ്ടി അണകൾ കെട്ടാനും ജലസംഭരണകേന്ദ്രങ്ങൾ നിർമ്മിക്കുവാനുമുള്ള ഗവർമ്മെൻറ് പദ്ധതികളുടെ വിജയം വിദേശത്തുനിന്നും ലഭിക്കുന്ന സഹായത്തെ ആശ്രയിച്ചിരിക്കുന്നു. ഫാറിൻ എക്സ്ചേഞ്ച് പ്രശ്നങ്ങൾ ഇതിലും അടങ്ങിയിട്ടുണ്ട്. ഈ സാധനങ്ങൾ ക്രഡിററിന്മേൽ കിട്ടുന്നതിന് ഗവർമ്മെൻറ് പരമാവധി ശ്രമിക്കുകയും കഴിയുന്നതൊക്കെ പ്രവർത്തിക്കുകയും ചെയ്തുവരുന്നുണ്ട്. വിദേശ ഗവർമ്മെൻറുകളും ഔദാര്യമോ സഹായക മനോഭാവമോ പ്രകടിപ്പിക്കാതിരിക്കുന്നതുമില്ല.

അളവററ പ്രകൃതിവിഭവങ്ങളോടും ബുദ്ധിമാന്മാരായ ജനങ്ങളോടും കൂടിയ ഒരു മഹത്തായ രാജ്യമാണ് ഇൻഡ്യയെന്ന് അവർക്ക് അറിയാവുന്നതുകൊണ്ടും പരിഷ്കൃതലോകത്തിന് ഒരുകാലത്ത് ഇൻഡ്യ ഒരു അമൂല്യ സമ്പത്തായിരിക്കുമെന്ന് ഉറപ്പുള്ളതുകൊണ്ടും ആ രാജ്യങ്ങൾ സാദ്ധ്യമായ സകല സഹായങ്ങളും ചെയ്തുവരുന്നുണ്ട്.

നമ്മുടെ ബുദ്ധിശക്തിയും ജോലിചെയ്യാനുള്ള കഴിവുംകൂടി ചേരുമ്പോൾ അളവിനും ഗുണത്തിനും പേരുകേട്ട സമ്പത്തായിത്തീരും. ലോകത്തുള്ള സകലർക്കും ഇതറിയാം. ജീവിക്കുവാനും

കാൎയ്യക്ഷമമായി ജോലി ചെയ്യുവാനും വേണ്ടത്ര ആഹാരസാധനങ്ങൾ നാം ഉല്പാദിപ്പിക്കാത്തപക്ഷം ഉന്നതങ്ങളായ ഈ പ്രതീക്ഷകൾ സഫലമാക്കാൻ നമുക്കു് സാധിക്കുകയില്ല. നിൎമ്മിതസാധനങ്ങൾ ഉല്പാദിപ്പിച്ചു് കയററുമതി ചെയ്യുവാൻ ഉടനടി നമുക്കു് സാധിച്ചില്ലെന്നു വരികിലും നമുക്കു് ആവശ്യമായ ആഹാരസാധനങ്ങളെല്ലാം നമുക്കുതന്നെ വിളയിക്കാവുന്നതാണു്.

നമ്മുടെ പ്രധാന ആഹാരസാധനങ്ങൾ അരിയും ഗോതമ്പുമാണു്. നെൽകൃഷിസ്ഥലങ്ങൾ ഒററക്കുതിപ്പിനു് നിഷ്പ്രയാസം വൎദ്ധിപ്പിക്കുവാൻ സാദ്ധ്യമല്ല. ഒരുതരം ആഹാരസാധനത്തിൻെറ കുറവു് മറെറാരുതരം സാധനംകൊണ്ടു് നികത്താവുന്നതാണു്. നെൽകൃഷിയെ ഉദ്ദേശിച്ചുകൊണ്ടുള്ള ജലസേചനപദ്ധതികൾ പൂൎത്തിയാകുന്നതുവരെ നമുക്കു് ചുമ്മാതിരുന്നുകൂടാ. എളുപ്പം നട്ടുവളൎത്താവുന്ന ധാന്യങ്ങൾ നാം കൃഷിചെയ്തു് വിളവെടുക്കണം. ചോളങ്ങളും പയറുവൎഗ്ഗങ്ങളും കിഴങ്ങുകളും സസ്യങ്ങളും പഴങ്ങളും എളുപ്പത്തിൽ നമ്മുടെ പുരയിടങ്ങളിൽതന്നെ കൃഷിചെയ്യാവുന്നതാണു്. കുളങ്ങളിൽ പ്രയാസംകൂടാതെ മത്സ്യങ്ങളെ വളൎത്താനും നമുക്കു് കഴിയും. അങ്ങനെ ഭക്ഷ്യദൗൎല്ലഭ്യത്തെ നമുക്കു് പരിഹരിക്കാവുന്നതാകുന്നു.”

ആഹാരക്രമത്തിൽ അല്പം ചില ഭേദഗതികൾ വരുത്തി, റാഗി, ചോളം തുടങ്ങിയ ധാന്യങ്ങൾകൂടി കഴിക്കത്തക്കവിധത്തിൽ അതു ക്രമപ്പെടുത്തുവാൻ രാജാജി രാഷ്ട്രത്തോടഭ്യൎത്ഥിച്ചു. ഇക്കാൎയ്യങ്ങളിൽ ഒരു മാതൃക കാണിക്കുവാൻ സമ്പന്നവൎഗ്ഗക്കാരെന്നു് പറയപ്പെടുന്നവരോടു് അദ്ദേഹം അഭ്യൎത്ഥിച്ചു. അവർ ചെയ്യുന്നതൊക്കെയും മററുള്ളവർ ആകാംക്ഷയോടെ അനുകരിച്ചുവരുന്ന വസ്തുത അദ്ദേഹം അനുസ്മരിപ്പിച്ചു. കഴിഞ്ഞകാലത്തു് ജയിലിൽപോക്കും, നൂൽ നൂല്പും, ഹരിജനോദ്ധാരണ പ്രവൎത്തനങ്ങളും ഒരു ഫാഷനായിത്തീൎന്നതുപോലെ രാജ്യത്തെ ഭക്ഷ്യകാൎയ്യത്തിൽ സ്വയംപൎയ്യാപ്തമാകുവാനുള്ള സൃഷ്ടിപരപ്രവൎത്തനം ഒരു ഫാഷനായിത്തീരണമെന്നു് രാജാജി അഭിപ്രായപ്പെട്ടു.

Frying Pan

Mary: "Do you know what they are buying in England for bacon?"
Joan: "No: what?"
Mary: "Frying pans."

വൃക്ഷങ്ങളിൽനിന്നു് ധനം

(കെ. എൻ. പിള്ള, ബി. എസ്സ്.സി.)

വ്യാപാരസംബന്ധമായി വൃക്ഷങ്ങളിൽനിന്നു് ലഭിക്കുന്ന ഫലങ്ങൾ, തടി, എന്നിവകൊണ്ടു മാത്രമല്ല പല വൃക്ഷങ്ങളും പ്രാധാന്യമർഹിക്കുന്നതു്. ഉദാഹരണമായി, റബ്ബർ നിർമ്മാണാർത്ഥം ഉഷ്ണമേഖലയിലെ ചില വൃക്ഷങ്ങളിൽനിന്നും ഒരുതരം കറ എടുത്തുവരുന്നുണ്ടു്: ബ്രസീലിലെ ആമസാൺ നദീതീരത്തുള്ള വനങ്ങളിൽ കാണപ്പെടുന്ന ‘ഹീവിയ ബ്രസീലിയൻസിസ്’’ എന്ന ഒരുതരം മരത്തിൽനിന്നും ധാരാളം റബ്ബർ ഉല്പാദിപ്പിച്ചുവരുന്നു. ദുർഗ്ഗമമായ ഉഷ്ണവനങ്ങളിൽ വളരുന്നതു നിമിത്തം ഈ മരത്തിൽനിന്നും റബ്ബർ എടുക്കുവാൻ വളരെ പ്രയാസമാണു്. ഈ മരത്തിൽനിന്നും വളരെയധികം റബ്ബർ ചുരുങ്ങിയ സമയംകൊണ്ടു് എടുക്കുവാൻ സാധിക്കുന്നതിനാൽ ജനങ്ങൾ ഈ കാടുകളെ കണ്ടമാനം വെട്ടിതെളിച്ചു. കൂടാതെ ഇവർ തങ്ങളുടെ നശീകരണപ്രവർത്തനങ്ങൾ വനാന്തർഭാഗങ്ങളിലേക്കും സംക്രമിപ്പിച്ചു. മദ്ധ്യ ആഫ്രിക്കയിലെ കോങ്ഗോ നദീതടങ്ങളിലുള്ള ഉഷ്ണവനങ്ങളിലെ റബ്ബർമരങ്ങളിലും ഇതേ നയംതന്നെ ആവർത്തിക്കപ്പെട്ടു. എന്നാൽ ഈ വ്യവസായത്തിന്റെ ആദ്യദശയിൽ ധാരാളം ധനം ആർജ്ജിച്ചതിനുശേഷം, ഉല്പാദനം കുറഞ്ഞുവന്നു. ഒന്നാം ലോകമഹായുദ്ധത്തിന്റെ ആരംഭത്തിൽ ‘പ്ലാന്റേഷൻ റബ്ബറി’ന്റെ ആഗമനത്തോടുകൂടി അഖിലലോക വ്യാപാരത്തിൽ കാട്ടുറബ്ബറിനു് യാതൊരു സ്ഥാനവും ഇല്ലാതെയായി.

ഇൻഡ്യാറബ്ബറിന്റെ മുഖ്യമായ ഉപയോഗം സങ്കുചിതമായ വിധത്തിലായിരുന്നപ്പോൾ അസംസ്കൃത റബ്ബറിന്റെ ശേഖരണം മാത്രം മതിയാകുമായിരുന്നു. എന്നാൽ Mackintosh-ന്റെ വാട്ടർപ്രൂഫ് തുണിത്തരങ്ങളുടെ കണ്ടുപിടിത്തവും Good Year കമ്പനിക്കാരുടെ വൾക്കനൈസിംഗ്മാർഗ്ഗവും മൂലം ഈ ചെറിയ തോതിലുള്ള റബ്ബർ ഉല്പാദനം പോരാതെ വന്നു. മനുഷ്യൻ, റബ്ബർ ടയറുകളിൽ, ലോകം മുഴുവൻ ചുററിസഞ്ചരിക്കാൻ തുടങ്ങിയതുമുതൽ വൻതോതിലുള്ള റബ്ബർ ഉല്പാദനം ആവശ്യമായിത്തീർന്നു. ‘ഹീവിയ ബ്രസീലിയൻസിസ്’’ എന്ന റബ്ബർമരത്തിന്റെ വിത്തുകൾ ബ്രസീലിൽനിന്നും അതുപോലെയുള്ള കാലാവസ്ഥയോടുകൂടിയ തെക്കുകിഴക്കേ ഏഷ്യയിലെ ഉഷ്ണമേഖല പ്രദേശങ്ങളിലുള്ള വനങ്ങളിൽ കൊണ്ടുപോയി നട്ടുപിടിപ്പിച്ചു. ഇവിടെ ആദ്യദശയിലെ സംശയങ്ങൾക്കും പരാജയങ്ങൾക്കും ശേഷം ഈ മരങ്ങൾ കാലാവസ്ഥയ്ക്കനുയോജ്യമാണെന്നു തെളിഞ്ഞു. അതിനാൽ ആദ്യം സിലോണിലും മലയായിലും, പിന്നീടു് ഡച്ചു് ഈസ്റ്റ് ഇൻഡീസിലും, ഇൻഡ്യായിൽ തിരുവിതാംകൂറിലും വൻതോതിൽ റബ്ബർമരങ്ങൾ നട്ടുപിടിപ്പിച്ചുവന്നു. ഇപ്പോൾ ഓരോ മരവും അനേകവർഷങ്ങൾ റബ്ബർ ഉല്പാദിപ്പിക്കുവാൻ കഴിവുള്ളവയായിത്തീർന്നിട്ടുണ്ടു്.

റബ്ബറിന്റെ കറ എടുക്കുന്നതിനായി ഓരോ മരത്തിലും ‘X’ എന്ന

അടയാളത്തിൽ വെട്ടിവയ്ക്കുന്നു. അതിൽനിന്നും ഒലിച്ചുവരുന്ന കറ ചിരട്ടകളിൽ ശേഖരിച്ചുവരുന്നു. ദിവസംതോറും ഇതുപോലെ മരത്തിൽ ചിരട്ട വയ്ക്കാറുണ്ട്. ഈ കറ, ഒരുതരം ശക്തികുറഞ്ഞ ആസിഡ് ചേർത്ത് പാകപ്പെടുത്തി, സമ്മർദ്ദം ഉപയോഗിച്ച് അതിലെ ജലാംശം മുഴുവൻ കളയുന്നു. ഇവ ഉണക്കിയതിനുശേഷം ഘനംകുറഞ്ഞ റബ്ബർഷീററുകളാക്കി കയററി അയക്കുന്നു. റബ്ബർതോട്ടങ്ങളിൽ ദിവസേന, കറ എടുക്കൽ, ഭൂമിയിലുള്ള പുല്ലും ചവറും മാററുക, മുതലായ ജോലിക്ക് ധാരാളം കുറഞ്ഞ ശമ്പളക്കാരായ ജോലിക്കാരെ ആവശ്യമുണ്ട്. തെക്കേ ഇൻഡ്യയിൽനിന്നും ഇറക്കുമതി ചെയ്യപ്പെട്ട തമിഴർ, ജാവാ നിവാസികൾ മുതലായവരാണ് മലയായിലെ റബ്ബർതോട്ടങ്ങളിലെ കൂലിക്കാർ. ഇവർ ആ ദേശത്തുള്ളവരേക്കാൾ കൂടുതൽ ഉത്സാഹശീലമുള്ളവരാണ്. റബ്ബറിന്റെ മാർക്കററ്‌വില അനുസരിച്ച് ഈ വിദേശികളുടെ എണ്ണവും കുറഞ്ഞും കൂടിയും ഇരിക്കും. തോട്ടം തൊഴിലാളികളായ ബ്രിട്ടീഷ്‌കാർ, തമിഴർ, ജാവാക്കാർ മുതലായവരെ കൂടാതെ ചൈനയുടെ തെക്കുഭാഗത്തുനിന്നും കുറെപ്പേർ കുടിപാർപ്പാരംഭിച്ചിട്ടുണ്ട്. ഇവരുടെ ഇടയിൽ, തോട്ടങ്ങളിലെ ജോലി ഓരോ കുടുംബത്തിലേയും എല്ലാ അംഗങ്ങളും ചെയ്തുവരുന്നു. അതിനാൽ അവരുടെ ദിനംപ്രതിയുള്ള ചിലവ് വളരെ കുറവാണ്. റബ്ബറിന്റെ വിലക്കയററവും, വിലയിടിവും അവരെ സാരമായി ബാധിക്കുന്നില്ല. അവർ വിലക്കൂടുതലുള്ളപ്പോൾ ഉല്പാദനം വർദ്ധിപ്പിക്കയും വില കുറവായ കാലത്ത് ഉല്പാദനം നിർത്തിവയ്ക്കയും ചെയ്യുന്നു.

യൂറോപ്യന്മാർ, സ്വദേശികൾ മുതലായ തോട്ടമുടമസ്ഥന്മാരുടെ ഇടയിലും വർദ്ധമാനമായ ഉല്പാദനം നിമിത്തം വിലയിൽ സാരമായ ഇടിവ് സംഭവിക്കുന്നുണ്ട്. ഒന്നാം ലോകമഹായുദ്ധത്തിനു മുൻപ് റബ്ബറിന്റെ വില വർദ്ധിച്ചപ്പോൾ തോട്ടമുടമസ്ഥന്മാർ അവരുടെ തോട്ടങ്ങൾ വിസ്തൃതങ്ങളാക്കി. എന്നാൽ പാകമായി വന്നപ്പോൾ വിലയിടിവുണ്ടായി. ബ്രിട്ടീഷ് ഗവർമ്മെണ്ടിന്റെ ഇടപെടൽനിമിത്തം മലയാ, സിലോൺ, ഇൻഡ്യാ എന്നീ സ്ഥലങ്ങളിലെ തോട്ടമുടമസ്ഥന്മാർക്ക്, റബ്ബർവില ഒരു നിശ്ചിതാവസ്ഥയിൽ എത്തുന്നതുവരെയ്ക്കും ഉല്പാദനം നിറുത്തിവയ്ക്കേണ്ടതായി വന്നു. എന്നാൽ ഡച്ചുകാർ ഇവരോടു സഹകരിക്കാതെ, റബ്ബർതോട്ടങ്ങൾ വിസ്തൃതങ്ങളാക്കി. കുറച്ചുനാൾ കഴിഞ്ഞപ്പോഴേക്കും റബ്ബർവില തീരെ കുറഞ്ഞ്, മുമ്പുണ്ടായിരുന്നതിന്റെ നൂറിൽ ഒന്നായിത്തീർന്നു. **1934** വരെയ്ക്കും, സ്വദേശി ഉല്പന്നങ്ങൾക്ക് കയററുമതി ചുങ്കം ഏർപ്പെടുത്തി, റബ്ബർവില വർദ്ധിപ്പിക്കുന്നതിൽ ബ്രിട്ടനും ഹാളണ്ടും തമ്മിൽ യോജിച്ചില്ല. ഉല്പാദനത്തിലും വിലയിടിവിലും നിരോധനം വന്നപ്പോൾ, ലോകത്തിലെ ആകെയുള്ള അസംസ്കൃതറബ്ബറിൽ പകുതിയും ഉപയോഗിക്കുന്ന ഒരു മോട്ടാർ വ്യവസായശാലയോടുകൂടിയ യുണൈററഡ് സ്റ്റേററ്സ് അതിനെ എതിർത്തു.

1941-വരെയ്ക്കും മലയാ റബ്ബർ ഉല്പാദനത്തിൽ ഒന്നാംസ്ഥാനം കരസ്ഥമാക്കിയിരുന്നു. അതിനുശേഷം

ഡച്ച് ഈസ്റ്റിൻഡീസായിരുന്നു ആ സ്ഥാനം വഹിച്ചത്. ഈ രാജ്യങ്ങളിലെ കയററുമതി ഉല്പന്നങ്ങളിൽ ഭൂരിഭാഗവും റബ്ബറാണ്. റബ്ബർ കയററുമതി ചെയ്യുന്ന മററു രാജ്യങ്ങളായ ഇൻഡ്യാ, സിലോൺ, ബോർണിയോ, ഫ്രഞ്ച് ഇൻഡൊ ചൈന, സയാം എന്നിവയെല്ലാം തെക്കുകിഴക്കെ ഏഷ്യയിലാണ് സ്ഥിതിചെയ്യുന്നത്. വടക്കെ അമേരിക്ക കൂടാതെ, ബ്രിട്ടൻ, ഫ്രാൻസ്, ജർമ്മനി, ജപ്പാൻ, റഷ്യ മുതലായ രാജ്യങ്ങളും മോട്ടോർ വ്യവസായശാലകളുടെ ആവശ്യത്തിലേക്ക് റബ്ബർ ഇറക്കുമതി ചെയ്തുവരുന്നുണ്ട്. അമേരിക്കയിൽ ബ്രസീൽ എന്ന സ്ഥലത്ത് ചില റബ്ബർവനങ്ങളുണ്ട്. കൂടാതെ 'Synthetic Rubber' എന്ന കൃത്രിമറബ്ബർ 1945 മുതൽ അമേരിക്കയിൽ നിർമ്മിച്ചുവരുന്നുണ്ട്. വലിയ തോതിൽ നിർമ്മിക്കുവാൻ സാധിച്ചാൽ ഇതിന്റെ ഉല്പാദനച്ചിലവ് കുറയുമെന്നും കണക്കാക്കപ്പെട്ടിരിക്കുന്നു.

വൃക്ഷങ്ങളിൽ ഒരു നല്ല വിഭാഗം അതിന്റെ തടിയുടെ ആവശ്യത്തിനായി മാത്രം ഉപയോഗപ്പെടുത്തിവരുന്നു. ഇതിൽ കട്ടിയുള്ളതെന്നും മാർദ്ദവമുള്ളതെന്നും രണ്ടു വിഭാഗമുണ്ട്. ഇതിൽ കട്ടികൂടിയത് ഉഷ്ണമേഖലയിലെ വിസ്തൃത പത്രങ്ങളോടുകൂടിയ മരങ്ങളിൽനിന്നും മാർദ്ദവമേറിയത് ശീതമേഖലയിലെ 'Coniferous trees' എന്ന മരങ്ങളിൽനിന്നും ലഭിക്കുന്നു. മദ്ധ്യ അമേരിക്ക, ആമസോൺ തീരപ്രദേശം, മദ്ധ്യ ആഫ്രിക്ക, തെക്കുകിഴക്കെ ഏഷ്യ എന്നീ രാജ്യങ്ങളിലെ ഉഷ്ണവനങ്ങളിൽ അനവധി കട്ടികൂടിയ മരങ്ങൾ ഉണ്ട്. എന്നാൽ അവയെ ഉപയോഗപ്രദമാക്കുന്നത് വളരെ പ്രയാസമാണ്.

നല്ല ബലവും ഈടും വേണ്ടതായ മരപ്പണികൾക്ക് തേക്ക് വളരെ നല്ലതാണ്. ഇത് തുരുമ്പിനെ നശിപ്പിക്കാൻ കെല്പുള്ളതാണ്. തേക്കിന്റെ വളർച്ച്ക്ക് സമശീതോഷ്ണസ്ഥിതി ആവശ്യമാണ്. അതിനാൽ തെക്കുകിഴക്കെ ഏഷ്യയിലെ മൺസൂൺ വനങ്ങളിൽ ഇത് ധാരാളമായി കാണാം. ബർമ്മായിലെ ആരക്കാൻ താഴ്വരകളിൽനിന്നും ധാരാളം തേക്ക് തടികൾ വെട്ടി ഐരാവതി നദീമാർഗ്ഗം റംഗൂണിൽ കൊണ്ടുവന്ന്, അവിടെനിന്നും കയററി അയയ്ക്കുന്നു. തേക്ക് ബർമ്മായിലെ മൂന്നു പ്രധാന കയററുമതി ഉല്പന്നങ്ങളിൽ ഒന്നാണ്.

വളരെ മാർദ്ദവമേറിയ മരപ്പണികൾക്ക്, ഭംഗിയുള്ള 'മഹോഗണി' എന്ന തടി ഉപയോഗിച്ചുവരുന്നു. ഇതിന് കാലപ്പഴക്കംകൊണ്ട് ഭംഗിയും മേന്മയും വർദ്ധിക്കുകയെയുള്ളു. ഈ വൃക്ഷം അമേരിക്കൻ ഉഷ്ണമേഖല, വെസ്റ്റ് ഇൻഡീസ്, മെക്സിക്കോ എന്നീ രാജ്യങ്ങളിൽ ധാരളമായി വളരുന്നു.

എന്നാൽ പല സ്ഥലത്തും വനം തെളിക്കൽ നടപ്പിലാക്കിതുടങ്ങിയിട്ടുണ്ട്. തൻനിമിത്തം മണ്ണിന്റെ ഫലഭൂയിഷ്ഠത നശിച്ചുവരികയും അകാലത്തിൽ വെള്ളപ്പൊക്കം ഉണ്ടാകുകയും ചെയ്യുന്നുണ്ട്. വടക്കെ ചൈന, യൂറോപ്പ്, അമേരിക്കയിൽ മിസ്സിസ്സിപ്പി നദിയ്ക്കു കിഴക്കുഭാഗം, എന്നീ പ്രദേശങ്ങളിൽ മുൻപുണ്ടായിരുന്ന വനങ്ങളുടെ അവശേഷം മാത്രമെ ഇപ്പോൾ കാണ്മാനുള്ളു. പണ്ട് വന

പ്രദേശമായിരുന്ന സ്ഥലങ്ങൾ ഇപ്പോൾ കൃഷിസ്ഥലങ്ങളായി രൂപാന്തരപ്പെട്ടിട്ടുണ്ട്. എന്നാൽ വ്യവസായ കേന്ദ്രങ്ങളിൽ കൃഷിസ്ഥലങ്ങളെല്ലാം ഫാക്ടറികൾ, തീച്ചൂളകൾ, വക്ക്ഷാപ്പുകൾ, തൊഴിലാളികളുടെ താമസസ്ഥലങ്ങൾ എന്നിവയായും രൂപം പ്രാപിച്ചിട്ടുണ്ട്. മിക്ക യൂറോപ്യൻ രാജ്യങ്ങളിലും അവരുടെ ഏററവും ചുരുങ്ങിയ വനസമ്പത്തിനെ സംരക്ഷിക്കുവാൻ വേണ്ട നടപടികൾ എടുത്തുതുടങ്ങിയിട്ടുണ്ട്.

യാതൊരു വിധത്തിലും ആസ്ട്രേലിയാ വനനിബിഡമല്ലെങ്കിലും, അവിടത്തെ 'യൂക്കാലിപ്ററസ്' എന്ന മരത്തിൽനിന്നും വെട്ടിയെടുക്കുന്ന തടിക്ക് ബ്രിട്ടീഷ്സാമ്രാജ്യത്തിലെവിടെയും പ്രചാരം സിദ്ധിച്ചിട്ടുണ്ട്. യൂക്കാലിപ്ററസിന്റെ ഇലകളിൽനിന്ന് ഒരുതരം തൈലവും വാററി എടുക്കുന്നു. ഇതു് ജലദോഷത്തിനും തലവേദനയ്ക്കും വളരെ പ്രയോജനമുള്ള ഒരു മരുന്നാണ്. മാർദ്ദവമേറിയ തടികളിൽ പ്രാധാന്യം അർഹിക്കുന്നതു് 'കോണിഫെറസ്' വൃക്ഷങ്ങളാണ്. പൈൻ, സ്പ്രൂസ്, ഫർ മുതലായ വൃക്ഷങ്ങൾ മിക്കവാറും ശുദ്ധമായ നിലയിലാണ് കാണപ്പെടുന്നതു്. കെട്ടിടം പണിയാനും, പെട്ടികൾ ഉണ്ടാക്കാനും മററും ഇവയുടെ തടിയാണ് ഉപയോഗിച്ചുവരുന്നതു്. ഇപ്പോഴത്തെ കാലത്തു് ഈ തടികൾ പേപ്പർ ഉണ്ടാക്കാനും ഉപയോഗപ്പെടുത്തുന്നുണ്ട്. സാധാരണയായി തടി നീളമുള്ള കഷണങ്ങളായിട്ടാണ് കയററി അയയ്ക്കുന്നതു്. എന്നാൽ ഈയിടെ ഇവകൊണ്ട് പണിതുതീർത്ത വാതിലുകൾ, ജനാലുകൾ, പ്ലൈവുഡ് മുതലായവയും വന്നുചേരുന്നുണ്ട്. വനങ്ങളിൽനിന്നും തടി വമ്പിച്ച തോതിൽ വെട്ടി എടുക്കണമെങ്കിൽ ജലഗതാഗതം മാത്രമെ ലാഭകരമാകയുള്ളു.

ക്യാനഡായിലും യുണൈററഡ് സ്റ്റേററ്സിലും ഉള്ള വനങ്ങളിൽനിന്നും വമ്പിച്ച തോതിൽ തടി വെട്ടിയെടുക്കുന്നുണ്ട്. എന്നാൽ അവിടെ രണ്ടാമതും വൃക്ഷങ്ങൾ നട്ടുപിടിപ്പിക്കുക എന്ന പരിപാടി സ്വീകരിച്ചിട്ടില്ല. അതിനാൽ കുറെ വർഷങ്ങൾ കഴിയുമ്പോഴെയ്ക്കും വനങ്ങളെല്ലാം നശിച്ചുപോകുന്നു. അവർ ഇങ്ങനെ ഒരു നടപടി സ്വീകരിച്ചതു് കുറെ വനങ്ങളെല്ലാം കൃഷിസ്ഥലങ്ങളായി രൂപാന്തരപ്പെടുത്തുവാനായിരുന്നു. അമേരിക്കയിൽ വനങ്ങൾക്ക് നാശം സംഭവിച്ചതു് യൂറോപ്പിൽ സംഭവിച്ചതിനേക്കാൾ ത്വരിതഗതിയിലായിരുന്നു.

യുണൈററഡ് സ്റ്റേററ്സിൽ വനങ്ങൾ നശിപ്പിച്ചതുമൂലം അവിടെയുള്ള തടിവ്യവസായം മന്ദഗതിയിലായിട്ടുണ്ട്. ഈയിടെയായി അവിടെയുള്ള വ്യവസായങ്ങൾക്കാവശ്യമായ തടി ഇറക്കുമതി ചെയ്യേണ്ടതായി വന്നിട്ടുണ്ട്. എന്നാൽ ഇപ്പോഴും തെക്കൻപ്രദേശങ്ങളിൽ കട്ടി കൂടിയതും മാർദ്ദവമേറിയതുമായ തടികൾ മുറയ്ക്ക് ലഭിച്ചുകൊണ്ടിരിക്കുന്നു. Pine Tar, Turpentine resin മുതലായവ ആ രാജ്യത്തിന്റെ കയററുമതി ഉല്പന്നങ്ങളാണ്. എന്നാൽ ഇവിടെയും വനം നശീകരണം മുറയ്ക്കു നടക്കുന്നുണ്ട്. അതിനാൽ ഏററവും ഒടുവിലത്തെ രക്ഷാമാർഗ്ഗം വടക്കുപടിഞ്ഞാറൻ പ്രദേശങ്ങളിലുള്ള വനങ്ങളാണ്. ഈ വനങ്ങൾ വിസ്തൃതങ്ങളായ പ

ൽമേടുകളാൽ കിഴക്കൻവനങ്ങളിൽ നിന്നും വേർതിരിക്കപ്പെട്ടിട്ടുണ്ട്.

തൊഴിൽപരമായി നോക്കിയാൽ, അമേരിക്കയിലെ തടിവ്യവസായം ധനം വർദ്ധിപ്പിക്കുന്നതിൽ ഒരു പ്രധാന പങ്കു വഹിക്കുന്നുണ്ട്. ഇവിടെ നിന്നും ധാരാളം തടി കയററുമതി ചെയ്യുന്നുണ്ട്. അമേരിക്കയാണ് ലോകത്തിലേക്കും ഏററവും കൂടുതൽ 'വുഡ്പൾപ്പ്' ഉപയോഗിക്കുന്നതു്. അമേരിക്കയിൽ ഉണ്ടാക്കുന്ന വുഡ്പൾപ്പ് കൂടാതെ ക്യാനഡായിൽ ഉണ്ടാക്കുന്നതും അവർ ഉപയോഗിച്ചുവരുന്നു.

ക്യാനഡായിലെ സ്ഥിതി ഏകദേശം ഇതുപോലെയാണ്. എന്നാൽ അവിടെ വനം നശീകരണം യുണൈററഡ് സ്റ്റേററ്സിലേതുപോലെ ഭയങ്കരമായി നടക്കുന്നില്ല. മാർദ്ദവമേറിയ തടിശേഖരണത്തിൽ സോവിയററ് റഷ്യ കഴിഞ്ഞാൽ അടുത്ത സ്ഥാനം ക്യാനഡായ്ക്കാണ്. ഇവിടെ തടി വെട്ടി എടുക്കുന്നതു് മഞ്ഞുകാലത്തിനു മുമ്പാണ്. തടികൾ വെട്ടി മഞ്ഞുകട്ടകളുടെ മുകളിൽ ഇടുന്നു. ഉഷ്ണകാലം വരുമ്പോൾ മഞ്ഞുരുകി ജലമാകുകയും, തടികൾ വെള്ളത്തിൽ കൂടി ഒഴുകി നിശ്ചിതസ്ഥാനങ്ങളിൽ എത്തിച്ചേരുകയും ചെയ്യുന്നു. കൃഷിക്ക് ഉപദ്രവകരമായ കാലാവസ്ഥ, വിശേഷിച്ച് മഞ്ഞുകാലം, തടിവ്യവസായത്തിന് പ്രയോജകീഭവിക്കുന്നു. കിഴക്കെ ക്യാനഡായിൽ സ്പ്രൂസ്, വൈററ്പൾപ്പ് എന്നിവയാണ് പ്രധാനപ്പെട്ട മാർദ്ദവമേറിയ തടികൾ. ഇതുനിമിത്തം ഒട്ടാവ, പൾപ്പ്വ്യവസായത്തിലും പേപ്പർവ്യവസായത്തിലും ഒരു മുഖ്യ കേന്ദ്രമായിത്തീർന്നിട്ടുണ്ട്. അവിടെ റയിൽവെ സ്ലീപ്പർസ്, ടെലഗ്രാഫ്, ടെലഫോൺ എന്നിവയ്ക്കാവശ്യമുള്ള തുണ്ടുകൾ മുതലായവ ധാരാളം ഉണ്ടാക്കുന്നുണ്ട്.

സ്വീഡനിലും നോർവേയിലുമുള്ള പൈൻതടി വളരെ ബലമേറിയതും ഈടുള്ളതുമാണ്. സ്വീഡനിലെ ജലമാർഗ്ഗങ്ങൾ നന്നാക്കിയതുകൊണ്ട് അവിടെയുള്ള വ്യവസായങ്ങൾക്ക് വളരെ പുരോഗമനം ഉണ്ടായിട്ടുണ്ട്. എന്നാൽ തണുപ്പുകാലത്ത് മഞ്ഞുറയ്ക്കുന്നതുകൊണ്ട് വലിയ വൈഷമ്യങ്ങൾ നേരിടുന്നുണ്ട്. ഫിൻലണ്ടിലും, ഒരു വർഷത്തിൽ ഏകദേശം പകുതി സമയവും, തുറമുഖങ്ങൾ ഉപയോഗശൂന്യങ്ങളായിത്തീരുന്നു.

സ്വീഡനിൽ വുഡ്പൾപ്പ് ഉപയോഗിച്ച് റേയൺവ്യവസായം വലിയ തോരിൽ നടത്തിവരുന്നു. കല്ക്കരിക്കുപകരം റെയിൽവേ എൻജിനുകളിൽ അവിടെ വിറകാണ് ഉപയോഗിക്കുന്നതു്.

ലോകത്തിലേയ്ക്കും ഏററവും കൂടുതൽ മാർദ്ദവമേറിയ തടിയുള്ളതു് സോവിയററ് റഷ്യയിലെ 'കോണിഫെറസ്' വനങ്ങളിലാണ്. ഇവ റഷ്യയുടെ ഒരററംമുതൽ മറെറ അററം വരെ നീണ്ടുകിടക്കുന്നു. ഈ 'കോണിഫെറസ്' വനങ്ങളുടെ തെക്കുഭാഗത്തായി Pine, Spruce, Fir, Oak മുതലായ വൃക്ഷങ്ങളുടെ ഒരു വനമായി രൂപാന്തരം പ്രാപിച്ചിട്ടുണ്ട്. എന്നാൽ ഇവിടെയും ചില ഭാഗങ്ങൾ കൃഷിക്കായി വെട്ടിത്തെളിച്ചിട്ടുണ്ട്. രാജ്യത്തിലെ ജനങ്ങളുടെ ദിവസേനയുള്ള ജീവിതത്തിൽ വനോല്പന്നങ്ങൾ ഒരു പ്രധാന പങ്ക് വഹിക്കുന്നുണ്ട്. വീടുകളും കുടിലുകളും തടികൊണ്ടുണ്ടാക്കപ്പെട്ടതാണ്. തടികൊണ്ടുള്ള കലപ്പകൊണ്ട് നിലം ഉഴുന്നു. തണുപ്പുകാലങ്ങളിൽ വിറക് ചൂടുപിടിപ്പിക്കുവാനും ഉപയോഗപ്പെടുത്തുന്നു. അതിനാൽ റഷ്യയിൽ മനുഷ്യനും വനവും തമ്മിലുള്ള ബന്ധം അഭേദ്യമത്രേ.