

germination capacity of a sample. Under the rules of the International Seed Testing Association a compromise is adopted. One half of the hard seeds is added to the number germinated for calculating the real value of the sample. At the end of each test, the total number germinated, the number attacked by mold and the number of hard seeds are also given.

Conclusion. In a vital matter like purchase of seed the farmer looks for qualities such as colour, size, lustre, plumpness and sometimes smell as in coriander, paddy, etc. No doubt, these are points worthy of consideration, but appearance is very often misleading and what is really wanted in addition to good appearance is a good performance when they germinate, for 'handsome is that handsome does'. So seed testing on scientific lines is very essential. Seed testing has been going on in the Western countries for more than half a century and two of the world's greatest seed testing stations are at Zurich in Switzerland and Copenhagen in Denmark. Very valuable research work in seed testing has been done at both these stations. There are seed testing stations established now in the United States of America, Great Britain, Ireland, Australia, etc.—in fact in almost all the civilised countries of the world.

This is an age of commercial competition and if the Indian farmer is to be progressive he must eliminate every element of chance in agricultural practice so as to strengthen his position in the universal struggle. Though a creature of habits and very conservative by nature, the Indian farmer must realise the present day conditions and rise up to the occasion. It is said that agriculture was a fairly easy task a hundred years ago when seasons were more normal, prices of seeds and other commodities low and labour much less expensive than now. The state of affairs is entirely different to-day. The Indian farmer must copy the farmer of the Western countries and adopt scientific methods and see that he reaps the maximum profit from his labours. One of the most important considerations should be that his seeds are pure both for the species and the strain or variety which he intends to grow, and free from impurities such as chaff, mud, weed seeds and insect or fungus attacked seeds or plant parts and also show a high percentage of germination and vigour. Hence the motto should be never to sow seeds without testing them for their vitality and purity.

SELECTED ARTICLE

America's New Deal in Agriculture.

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In 1929, things began definitely to go amiss with the American farmer. Since the World War, 1914—18, agriculture has been existing in a state of fluctuating prosperity, trying to keep pace with the crazy finance of the industrial world in America. The policy of high tariffs, high prices, and heavy over-production, combined with a shrinking overseas market, brought the economic depression in its train, and the first man to feel the effects was the farmer. The first reaction was to put into practice the idea that the way to pay bills was to produce

more—producing more meant flogging the land or using more machinery for large scale cheaper production. To pay for machinery, constant cropping was necessary, and that meant more goods to sell on an overfull market at low prices. When prices are low the 'grow more-sell more' principle merely puts the farmer more hopelessly into debt. In addition the fertility of the soil decreased and erosion played havoc with the land. It was brought out in 1932 that a farmer's income was only half that of 1914. This was due to the fact that while the farmer paid 9 per cent. more for the same goods, he sold his own produce for 43 per cent. less than in 1914. Continuance of this state was impossible and before remedial measures were instituted there had been a serious decline in the prosperity of the farmer, often to subsistence levels, accompanied by a no less serious degeneration of the soil.

A great deal has been said about the 'New Deal' of President Roosevelt, often loosely and without a clear understanding of the idea behind it. Americans themselves are highly critical of it but as far as could be gathered last year, they have small idea of what to put in its place. At any rate in these days, they, and we also, cannot afford to be negative. What is this New Deal in Agriculture? It may be summed up very briefly—stability and security: a policy of save the farmer and save the soil. The American farmers are a most independent and individualistic people; it is part of their creed to stand by the idea of a God-given right to plough their own furrow. They have clung to their right of possession of their land up to the stage of dispossession and then moved to new fields exactly as the "Okies" migrated westward into California and the Dakotans into Oregon and Washington in the last five years. But the New Deal has given a plan to keep farmers from moving and even if it guarantees only a subsistence level of life, it has the merit of security. There has grown a spirit of co-operation, of community endeavour which overrides independence and makes the group plan and helps its individual members. President Roosevelt has been interested, personally, in farming all his life and understands the farmers' position. No other leader seems to have grasped the problem so well or tried to do so much. What failure there is, is not due to the *spirit* of the New Deal whatever the criticism of its action.

The history of American farming in the past ten years has been disastrous but the decline from as far back as 1920 has been severe. There are 6½ million farm families in the U. S. A., forming 22 per cent. of the population. In 1920, they received 15 per cent. of the total national income—in 1925, 11 per cent. in 1928, 9 per cent., and 1932, 7 per cent; since 1932 most of the mass migrations have occurred which forced the nation to take an active part in stabilising the agricultural industry. There was pressure on land in some places when the closing factory doors sent jobless sons to their father's farm and in other places, the land was abandoned. Last year the Texas and Oklahoma panhandles, and the adjoining parts of Kansas and Colorado which form the very heart of the famous "Dustbowl", presented a very un-spring-like picture in April. In driving 50 miles through the Oklahoma panhandle into Kansas and into south Western Colorado, there was not one mile of green to be seen. Odd patches of sprouting wheat and some of the ubiquitous roly poly did not relieve the grey and brown landscape of windblown soils and dead grass. Drifting soil had shaved off the grass and young wheat plants and piled itself in hummocks and along fence rows. The resident owners had walked off, absentee landlords had given up the task and the mortgagees from New York to San Francisco were waiting for the promise of a good year or high prices to return. At this time 300,000 migrants from degenerated lands west of the Mississippi were moving with the tide of employment hopelessly up and down California, while Oregon and Washington tried to absorb the human stream for Motaba, the Dakotas and

Nebraska. Through Tennessee and the southern States there was poor living for the farmers and an increase in tenancy and share cropping. The average farm income in Alabama in 1938 was about 500 dollars, as compared with 2,500 dollars in Iowa as the most prosperous State in the Union.

The story of land misuse and erosion painted so vividly by the publicity men in the Department of agriculture of the southern part of the country did not need exaggeration. Travelling in 1939, through these south-eastern States gave the impression that commonly the farmers were far from secure. At the last census in 1930, 42 per cent. of all the farmers in the U. S. were tenants who farmed 43 per cent. of the total farm acreage. The principle of tenancy is recognised as being against good farming. No farmer values someone else's land as his own. Much of the tenancy is found in the south and the west-central States so severely hit by drought and pests.

With this sketchy background it may be possible to visualise something of the urgency and the reason for the force of the New Deal campaign for stability and security of the farmer. From 1933 onward, since President Roosevelt came to power, there has been a series of acts passed by Congress aimed at improving agricultural conditions. These cannot all be mentioned, but some are highly useful examples for us to study. The new Deal policy had three main aims. (i) Reorganisation of the Department of Agriculture. (2) Policy of planned land use. (3) Reduction of farm taxation and prevention of mortgage foreclosure.

In the fulfilment of these plans a great many new duties were given to the Department of Agriculture, for which provision of staff and finance was made, but as the new agencies multiplied there arose some confusion of effort and conflict as to the scope of work. In 1938, the Bureau of agricultural Economics was given the job of planning a programme of investigation and assistance, and an office of Land Use Co-ordination created for the purpose of co-ordinating the work of the various sections of the Department in their approach and service to the farmer. This is the body which carries the second item in the programme-planned land use.

Planning land use really developed from two angles. First the policy of land improvement sponsored by the Agricultural Adjustment Administration—the A. A. A. or Triple A.—and secondly, the activity of the Soil Conservation Service in stabilising land against erosion. The main function of the A. A. A. was the limiting of the production of primary products in accordance with the market's demands. Briefly, the Bureau of Agricultural Economics undertakes the work of predicting market requirements in advance and assessing a figure for total U. S. production of certain crops and livestock in the current year. The main crops affected are wheat and cotton—this year tobacco will probably be important also. The A. A. A. then portions out the area for each State concerned with the crop, and it is possible for it to swing production gradually from one part of the country to another on the grounds of greater suitability of climate or superior quality of product. This can only be done by degrees to avoid the shock to local industry, but the aim is good, namely to concentrate production in the most suitable belts and build up compensating industries in those parts deprived of a staple crop. Each State distributes its quota according to counties and the county deals with the limiting of its own crops according to its allotment. Up to 1935, the payment made by the Federal Government to compensate farmers for the smaller area planted was taken from a tax on processed primary products such as flour, but on this tax being declared unconstitutional by the U. S. Supreme Court, the later payments have been met from general revenue. There was one change made in policy—the farmer was given a contract with wider obligations. If the taxpayer at large had to pay the farmer, he was entitled to demand a return for his money: since the land is a national asset and therefore

everybody's concern, a return could be made by the farmer improving his land as a national asset. The farmer was required to restrict his crop and to plant or treat the land thereby not used in a manner prescribed by federal agents. He had then three alternatives. He could perform the full contract of restriction and prescribed management and be paid for it. He could restrict his crop without carrying out any soil building programme, in which case he would not be paid; or he could neither, in which case he would be penalised by the confiscation of the excess crop. The first course is naturally adopted by the main body of farmers. The point to be noted is that a string is tied to the contract and the ultimate aim is not only to control the market supply of the crops but to institute a programme of land improvement—whether it be by prevention of erosion by the use of legumes or pasture for raising fertility, or by the retirement of unsuitable areas to farm "wood lots"

The second agency in land use planning is the Soil Conservation Service. The Service was set up in 1936 specifically to tackle the problem of soil erosion and conservation nationally, and in a manner not possible for all individual states. It has worked by advice and active assistance in farm planning, but in particular through soil conservation districts set up, with an advisory staff, at the voluntary request of the farmers of the district. The soil conservation district was organised with a manager and a variety of assistants trained in agronomy, engineering, forestry etc., according to the nature of the area. The object was to reclaim degenerated portions of the district and make an attack on problems of farm management as they affected soils, stabilisation and crop improvement. The soil conservation district permitted soil erosion control to be instituted on a wide scale, with the aid of demonstrations and experiments and the organisation of the whole community on the basis of planned agriculture.

Whatever was done for advancing the farmer and raising his income, equally assisted in keeping him from moving. Security of farm ownership meant a great deal to a farmer in constant fear of a succession of adverse years, mortgages and possible foreclosure, of being forced into tenancy or finally into share cropping. The evidence seems to show that this was no unusual condition, and a very great problem in many States. There was a way out. The land could be improved in production and rendered secure by development along sound lines made possible partly by A. A. A. payments and partly by loans made through the Farm Security Administration. The latter agency was set up in 1937, for the specific purpose of financing farmers with a genuine case for assistance. The loans are of three types. First, good farmers who have lost their land or are on submarginal land incapable of returning them a living may be lent money to re-establish themselves on a fertile site. There is a requirement that the new farm be handled correctly, and Federal officers have the job of watching the development. Second, farmers might receive loan to allow them to get on their feet again, provided they followed intelligent farm management plans. These loans are on a five-year to ten year basis at low interest. They were used for buying livestock, implements, fertilisers, and such things that a low income would not allow for effecting improvements. Third, tenant farmers may be assisted by long term low interest loans to buy farms for themselves. For five years after purchase, the Government may resume the farm if it is not used properly, and throughout the period of the loan Federal officers may supervise farming operations.

Another Act passed by Congress authorised the purchase of submarginal land to remove it completely from the market and develop a better use for it. This land is being taken out of poor farms into range grazing land, forests, recreation areas, or other suitable uses. The amounts of money voted for this and the loans to tenant and other farmers are small by comparison with the need. There are 86 million acres of submarginal land in farms, and only 50 million dollars were

voted to begin buying it. The numbers of tenant farmers were increasing between 1880 and 1935 at the rate of 33,000 per year; the 50 million dollars in 1939, the largest amount voted for assisting tenant farmers, would not nearly cope with the annual increase if all were to be re-established as landholders. Obviously a proportion would not be worth financing even on supervised farms.

Of all the efforts at improvement, none are more interesting than the community planning sponsored by the land use planning agency of the Bureau of Agricultural Economics. Despite the independent attitude of the farmer, there has come a strong movement towards co-operation and in at least one county in every State communities have elected committees to study and plan for the improvement of the district. The committee is essentially made up of farmers with some State or Federal agents acting as advisers. Their object is to work out a scheme for lifting the level of the community, for example by proposing on the agricultural side a more extensive use of fertilisers, or an increase in the number of high-class bulls, and on the social side, a new road or moving a school site or a rural electrification scheme, or the provision of a recreation reserve. The committee formulates the programme of improvement they would like for the community and, to implement it, may ask for assistance by money loan, cheap electric supply, fertilisers at low rates, or perhaps labour to be done by a Civilian Conservation Corps youths' camp. The community scheme is passed on by the State planning committee, if they are agreeable to Washington, where it may be accepted or referred back for amendment. The Government both State and Federal, is keen to help these community committees because the security and stability of the rural population is one of the most urgent problems to be faced. Last year 450 counties had begun community planning within eighteen months of the inception of the movement by the Department of Agriculture so that the future progress of the scheme will be very interesting to follow.

The account given of the activities of Federal agencies set up as a part of the New Deal policy has been necessarily sketchy and there are many other aspects which could be discussed. For example, there is the Tennessee Valley Authority's programme of development and rehabilitation in that area touching on seven States, all of which are co-operating. The co-operation of State and Federal research and extension services is a most pleasing sign; it is a recognition that the brains, as well as money, of the Federal Department can be used to solve national problems within individual states. A Federal Crop Insurance Act, 1938 attempts to insure crop returns to the farmer. The Surplus Commodities Act, 1937-8 provides money for buying crops in excess of the estimated production to prevent gluts and low prices. The Omnibus Flood Control Act, 1936-8 seeks to co-ordinate Federal Government attack on flood problems by bringing in the Department of Agriculture to work with army engineers; it was the first sensible step in flood control in so far as the problem was tackled at its source in run-off control through land management instead of by building bigger and better levees as in the past. A Water Facilities Act of 1937 provides money for developing water resources in arid and semi-arid regions according to an approved land use programme. From various sources the Secretary of Agriculture is given emergency relief money to preserve wild life, forests, soil, and to control insect pests.

There are a great many critics within and without America of this vast planning programme and public expenditure. Foreign observers often have not quite grasped the size of the country and the extremely serious state it was in. It is all very well to say there is "graft" and misuse of money, that the country cannot go on indefinitely assisting farmers, that the administration does not know where it is heading or when to stop, and that the whole organisation is a

pretty example of triumphant and bungling bureaucracy. In the foregoing pages the principle aims and some of the methods of the New Deal have been described, and undoubtedly good is being done. Some "dictators" have made the statement, somewhat cold-bloodedly, that as the western Dakotas and Nebraska and much of the Dustbowl constitute only range land and have been broken up for wheat by mistake, that they should just simply revert to grass and the quicker the better. Unfortunately such wholesale programmes are impossible because population cannot be moved *en bloc*. Much of the Texas panhandle is held in 320-acre or smaller areas, and the average carrying capacity of range land is 10 or, on good land may be 20 beasts per square mile. What then is to be done with say 100,000 farm families who would pass out with the return of the range. Resettle them? And if so, where? Or send them into the towns, and as surely on to relief? The projected plan for the Dustbowl reduces wheat acreage from 19 million to 13 million acres and proportionately alters all other crops while putting the remainder into grass. Ultimately the agricultural system will find its proper balance. It cannot be indefinitely supported by government grants, payments and loans, but if these had not been used in the past five years the critics would have had much more reason to deplore the continuance of the Old Deal. In any case, at least one traveller last year in America found the critics without a plan to substitute.

Surely the way to view the New Deal is as an attempt to save the farmer and the land by the only means that seemed adequate in the desperate condition affairs were reaching in 1934: namely by a huge expenditure of public revenue and loan money. The eyes of the nation are tending to focus on control of land use by Federal or State or other bodies. The people are learning no longer to permit the use of unsuitable and submarginal land in small holdings and in rural communities the spirit of co-operation to improve farms, incomes and living in general is stirring. There are many things the farmer can thank the New Deal for, and perhaps the salvation of the farmer in the long view may transcend the mistakes and cost of the great experiment. Australia has not the same problem to face, but there is every need for land use planning and sound development of a *permanent* agriculture. Eyes on America therefore for experience, with a tolerant discriminating judgment. (*Journal of the Australian Institute of Agricultural Science* 6: (1940) 78-84.)

ABSTRACTS.

Cold Resistant Sugar Cane. *Queensland Agri Jour.* 53: (1940). An experiment is now being carried out in the United States in the division of sugar plant investigations. The variety in question was received from Turkestan, and during the past three years several further importations of the same type of cane have been made. It is quite probable that there are many such varieties of wild cane in the vast stretch of country between the Caspian Sea and Western China, but the difficulties of travel in such remote parts have prevented visits by plant explorers. The outstanding characteristic of this "Turkestan" cane—is its ability to withstand extreme cold. The first importation was grown in the vicinity of Washington, U. S. A. at a latitude similar to that of Tasmania. During winter in spite of the fact 15 to 20 degrees of frost were registered, the plants remained green and few of the lateral buds were killed. The cane was also found to grow quite rapidly under the comparatively cold conditions of spring. Sugar-cane in Louisiana suffers from the extreme disability of late autumn frosts so that it has to be harvested before it is ripe, while early spring frosts prevent its early planting or ratooning, so that the cane has a growing season of only some seven or eight months per year. Dr. Brandes and his associates have tried to hybridize