

These seedlings are as yet only in the multiplication stage at the various Provincial stations, but the outstanding seedling in this batch would appear to be Co. 419. It combines the good qualities of such famous canes as P. O. J. 2878 and Co. 290.

In this note the main object has been to detail briefly the work done at the Thick Cane Area of the Imperial Sugarcane Breeding Station, Coimbatore, and to indicate the seedlings that, from preliminary reports, appear to be promising. The varieties suitable for a particular tract can only be found out by trying them in the tract itself and the credit for finding the varieties most suited for the tract should, of course, go to the officers of the Provincial Departments of Agriculture who experiment on them on a field scale.

SOME TRIALS WITH ERI SILK WORMS

BY M. C. CHERIAN, B. A., B. Sc., D. I. C.,

Lecturer in Entomology, Agricultural College, Coimbatore.

Introduction. About three lakhs of acres of Castor (*Ricinus Communis*) are grown every year in the Madras Presidency. Coupled with this is the fact that the climatic and the weather conditions in this Presidency are such that Eri silk worms can be reared for at least seven to eight months in the year. The Madras Agricultural and Industrial departments are now studying the problem of popularising Eri silk worm rearing as a cottage industry. With a view to getting detailed information under Coimbatore conditions the writer made a few preliminary trials last year and the following is a short account of the information gained so far.

Leaf and Seed Yields of Castor. For yield trials "Central Farm Spineless" variety of castor was used. Leaves and seeds were collected regularly. The yields from an area of one cent (7 yards × 7 yards containing 67 plants) of the above mentioned variety grown in red soil as a rain-fed crop are given below :—

Table I. Comparative yields of 'Leaf picked' and Control plots.

Pickings.	Yield from 'Leaf picked' plot.		Yield of seed from control plot.	
	** Leaf.	Seed.		
	lb.	oz.	lb.	oz.
1st picking.	55	8	1	4
2nd "	13	8	0	2
3rd "	10	8	2	14½
4th "	4	8	1	1½
Total.	84	0	5	6

** The weight of the leaf including the stalk is given in the table. When feeding worms only stalkless leaves are given. Roughly the percentage of blade to stalk is about 70—75 per cent.

it will be seen from the table that four pickings from one cent of Castor gave 84 lb. of leaves. The yield of seeds from the same plot came to 5 lb. 6 oz. as against 11 lb. 6 oz. from the control plot of one cent from which leaves have not been removed. Roughly the yield of seed from the 'Leaf-picked' plot was half that of the control plot. As it is not advisable to calculate the yield of leaf and seed per acre based on one cent of castor, arrangements are in progress to carry out this trial on a bigger scale.

The results of the examination of the seeds both from 'Leaf-picked' and control plots for germination and oil contents tests by the Lecturer in Botany and the Agricultural Chemist respectively are given below:—

Table II. Germination Tests

Source of seed.	No. of seeds germinated on successive days of test				Mould infected seed.	Total germinated.	Percentage of pure germinating seeds.
	1.	2.	3.	4.			
From Leaf-picked crop.	43	39	2	—	16	84	
	60	26	3	1	10	90	87.5
	53	33	4	—	10	90	
	51	29	6	—	14	86	
From Control plot.	61	24	4	—	11	89	
	57	24	7	—	12	88	88
	59	18	4	—	19	81	
	54	32	6	2	6	94	

Table III. Oil Content test.

Heads of analysis.	Seed from 'Leaf-picked' plot.	Seed from Control Plot.
Kernel.	74.25 %	73.77 %
Shell.	25.75 %	26.23 %
Oil in Kernel.	63.23 %	63.43 %

Quantity of leaf required for producing one pound of pierced Cocoons. Silk worms especially in the later stages of their growth are very voracious feeders. In one instance 280 worms consumed 4½ lb. of leaves in one day. In one trial 83 lb. of leaves were required to produce one lb. of cocoons. In another trial 75 lb. of leaves produced one lb. of cocoons.

Food Plants other than Castor. The first attempt in this direction was to find out whether tapioca (*Manihot utilissima*) and Ceara rubber (*Manihot glaziovii*) both belonging to the same Natural Order as that of Castor viz., *Euphorbiaceae*, could be utilised for feeding the worms. In the course of the feeding trials it was found possible to rear the worms on both the leaves but in the case of *tapioca* there was considerable mortality among the worms and even the few cocoons

produced were very small in size, only about $1/5$ the size of the Castor cocoons. In the case of *rubber* the mortality was not so high and the cocoons produced were better than those of tapioca and about half the size of Castor cocoons. In both cases the life cycle was longer by a week to ten days more than that with Castor.

An attempt was also made to feed the worms for the first ten days on Castor and the remaining period on either tapioca or rubber leaves. The cocoons produced by these were in both cases smaller than those reared on castor alone.

Other plants such as papaya (*Carica papaya*) plantain (*Musa paradisiaca*) ground-nut (*Arachis hypogaea*) portia (*Thespesia populina*) Country almond (*Terminalia catappa*), *Cyanotis Cocullata*, *Trianthema portulacastrum*, *Trianthema decandra* and *Portulaca Oleracea* were tried but the worms did not thrive on these. Slack (1884) has recorded that the worms feed on *Heteropanax fragrans* and that they could thrive in later stages on *Jatropha Curcas*, *Gmelia arborea* and *Zizyphus jujuba*.

Varietal trials with Castor. Advantage was taken of the presence of a number of castor varieties raised by the Oil Seeds Specialist, on the Central Farm, Coimbatore, to study whether the cocoons produced by worms feeding on these different varieties showed any difference in the weight and fineness of silk. Some differences were noticed in the different varieties. As these will have to be confirmed by further feeding trials the results will be given in a further contribution on the subject.

Disposal of Cocoons. As a result of the enquiries made by the writer one firm in Assam has signified its willingness to buy Cocoons at the following rates (per maund of 82 lb.)

Clean cocoons (reversed) First quality	Rs. 55.
Second 50.
Unclean cocoons (pierced) First 45.
Second 40.

The price quoted is exclusive of freight charges which work to about Rs. 9 by goods-train from Coimbatore. It may be mentioned here that the prices offered are not very attractive but these are the best available so far.

Acknowledgment. My thanks are due to the Oil Seeds Specialist, the Agricultural Chemist and the Lecturer in Botany for help rendered in connection with these experiments.

ABSTRACTS

Farm Yard Manure—Manurial value, (*Jacott's Hill Agri. Res. Bull. Vol. 3. Page C 12 and 44. Extract from Rothamsted Station Report for 1932*). Experiments were conducted at Rothamsted and the following results were recorded.

LIBRARY
TNAU, Coimbatore - 3



000035234

1. The effect of the manurial application is not only seen in the increased yield immediately obtained but also in the succeeding crops. It improves the soil and also persists for a longer period than one year.

2. Repeated application of the manure year after year exerts a cumulative effect and the results are higher than those obtained after "one year" application. Besides, the "residual effect" is beneficially felt in several succeeding crops even after the application of the manure had ceased.

3. The slow utilization of the nitrogen of the farm yard manure by the crop is due to an accumulation of nitrogen in the soil, a part being subsequently available for the plant. There is also free loss of nitrogen. The fate of 100 parts of nitrogen (in farm yard manure) applied to the soil is somewhat as follows:—

taken by the crop 30 to 20; retained in the soil 40 to 25; lost 30 to 55.

4. Every pound of nitrogen taken up for farm yard manure results in a higher proportion of grain to straw as compared to that of nitrogenous fertilizers (nitrate of soda). A continuous and steady application of farm yard manure during a period of 50 years has established its superiority in maintaining the fertility of the soil. The result obtained is tabulated below.

	Unmanured		Change in 50 years.	Complete Artificials (Plot 6).		Farmyard manure (Plot 11 b).	
	1876	1926		1926	Change in 50 years.	1926	Change in 50 years
Barley Plots—							
Nitrogen per cent.	0.156	0.094	-0.062	0.109	-0.047	0.151	-0.005
Do. tons per acre.	2.14	1.29	-0.85	1.50	-0.64	2.07	-0.07
Carbon per cent.	1.49	0.90	-0.59	1.37	-0.42	1.50	+0.01
Do. tons per acre.	20.4	12.3	-8.1	14.6	-5.8	20.5	+0.1
Wheat Plots—							
Nitrogen per cent.	0.156	0.109	-0.047	0.104	-0.052	0.145	-0.011
Do. tons per acre.	2.14	1.49	-0.65	1.43	-0.71	1.99	-0.15
Carbon per cent.	1.49	1.23	-0.26	1.07	-0.42	1.52	+0.03
Do. tons per acre.	20.4	16.8	-3.6	14.6	-5.8	20.8	+0.4

S. R. S.

Compost: A cheap organic manure. By Kunwar Narain Singh, Superintendent of Agriculture, Unao (Oudh) (From *The Allahabad Farmer*, January 1934). The author after discussing the importance of a good supply of manure for successful crop growth, describes a new method, recently introduced by Mr. K. G. Allan Director of Agriculture of the United Provinces, of preparing a compost from the vegetable rubbish which gives 4 times the quantity of manure in a quarter of the time ordinarily required for preparing manure by the heap system. This method, according to the author is being found very successful on Government and private farms.

The size of the pits and the quantity of litter etc. can be increased proportionately according to the number of cattle.

For one pair of bullocks, fifteen pits 8 by 5 by 2 feet deep each are made to deposit the litter. The urine is preserved by the 'urine-earth' system. Litter from various sources is spread in the cattleshed 2 to 4 inches deep every morning and removed to the pits after 24 hours. One pair of bullocks will give sufficient litter to fill one pit in six days. The pits are filled one after another in successive order. On the ninetieth day when the fifteenth pit will have been

filled the compost will be ready in the first pit. This is removed and stored in a heap, covered with earth or leaves for preserving it and is used when necessary. The compost has to undergo certain operations during its stay in the pit. Since rapid rotting of all vegetable matter is due to fungus, this is introduced into vegetable matter and air and moisture necessary for its development are controlled and this process of rotting, which takes about a year in the heap system of manure making, is finished in 90 days, and gives a compost of a higher nitrogenous percentage. The fungus is introduced into the litter in the form of a culture solution called glurry, which is prepared by mixing dung ash, urine-earth and fungus-starter with water. Any decomposable vegetable matter which has a kind of white substance on it will serve the purpose of fungus starter. The author further describes in detail how the litter is deposited in the pit and the attention that is to be bestowed on it when it remains in the pit. He also gives an account of how this manure is beneficial for crop growth.

U. N. R.

Production Credit for Agriculture. (*U. S. A. Extension Service Review*, November 1933). Mr. S. M. Garwood, Production Credit Commissioner for the Farm Credit Administration is controlling what is found to be a sound co-ordinated production credit system for agriculture. This system consists of 12 production credit corporations in each of the 12 Federal Land Bank districts and hundreds of local production credit associations. These associations are operated and controlled by farmer-borrowers and eventually to be owned by them. In the words of Mr. Garwood "It is not a kind of porous plaster that we are attempting to apply to the backs of debt-ridden farmers; rather, we are providing facilities for a credit system that will constitute in a permanent way to a solution of some of agriculture's financial problems." This system has been organised in the following manner:—

In each Land Bank district production credit corporations are established with a capital of 7½ million dollars each. The money is obtained from the Farm Credit Administration of the Federal Government. Production Credit Associations are organised in every place, operated and controlled by farmers themselves and these Associations are financed by the Corporations which retain the supervisory function and also prescribe rules and regulations for the issue of loans. The Corporations also determine the interest rates and the security that will be required.

Farmers of any place are induced to join and form the credit associations and buy an amount of stock in it equal to 5% of the money they borrow. They do not purchase stock until they actually borrow. This carries no double liability and they are entitled to vote at the association meetings. This stock is known as Class B stock. Class A stock is that provided if the Credit Corporations amounting to 20% of the loans to be made. The money obtained from the sale of these stocks is invested and deposited as security with the Federal Intermediate Credit Bank in the district. Interests earned on these bonds become the associations' income. "The money the association lends to farmers is obtained by re-discounting farmers' notes with one of the Federal Intermediate Credit Banks. Ordinarily the Association can rediscount such notes up to from four to six times its capital and surplus." The local production credit associations are important units (comparable to some extent, to our co-operative unions) and they examine all securities and authorise issue of loans to farmers for production purposes. Most of the loans are made for less than a year and no loans are issued for more than 3 years.

S. V. D.

Utilisation of Seed-cake in Industry. By V. Subrahmanyam, D. Sc., F. I. C. and N. Srinivasan, M. A. (*The Scholar*, October 1933). The authors after describing the present uses of oil seed-cakes for utilisation as articles of diet, feeds for

domestic animals and as organic manures discuss the difficulties of the producer in using them on a large scale. Storing them for a long time ruins the seed-cakes due to rapid deterioration of the stored products in tropical countries as a result of insect attack and fungal growth. Further they become harmful to the animals fed on them by causing pathological conditions of the animal system. They also spoil the quality of the milk and butter. In consideration of this the authors put forth some suggestions for increased use of oil seed-cakes.

Since proteins present in many seed-cakes have properties similar to those of milk casein and in view of the difficulties in the manufacture of the latter the authors are of opinion that these seed-cakes could be used in place of milk casein in the preparation of oil paints, paper making, plastic industry, manufacture of special adhesives, photographic plates, soaps, leather, insecticides etc.

The authors then proceed to give an account of the investigation carried out by them on the preparation of vegetable casein from non-edible seed-cakes and utilisation of the product in a few of the above mentioned industries. Earth Soda (Sodium Carbonate) used as a watery solution (0.1 per cent) was found most suitable for extracting the protein. The powdered cake is heated with the soda solution and after standing for some time, to filter out the liquid on top of which contains the dissolved protein. The operation is repeated a number of times until extraction is complete. The remainder is obtained by pressure of 1 to 2 tons per square inch.

The Soda extract is heated with chalk and white clay (Kaolin) which neutralises the Soda, starts the fermentation of the extract and at the same time separates out together with the protein. The product obtained is clean and white and possesses adhesive properties.

U. N. R.

World Rice Supplies and Markets. C. J. Robertson in the November 1933 number of the *International Review of Agriculture* (pp. 774-782) summarises the present position of world rice supplies and markets as follows:—

The Eastern Exporters. Burma, French Indo-China and Siam are the important exporters. In Burma the area under paddy has increased in the current year; according to the first forecast 12, 720, 800 acres have been sown for 1933-34, an increase of 26 per cent on the corresponding estimate of last year. The final estimates usually being larger than the October estimates, the record of 13,022,000 acres attained in 1930-'31 may again be touched if not exceeded. In French Indo-China the export of surplus from the 1933-34 crop is likely to be small. In Siam due to the damage caused by floods the area has decreased by one per cent.

As regards the movement of the 1932-33 crop, in Burma shipments from all parts up to end of October may be estimated at about 5,530 million pounds as against 4,854 million pounds in 1932 and at the end of October about 2,200 million pounds of the 1932-33 crop remained to be exported. Exports to eastern markets have declined and the takings of the European market and the United Kingdom are larger. Exports from French Indo-China amounted up to end of September to 2,314 million pounds against the total of 2,032 million pounds of 1932 showing an increase of 14 per cent. This increase is due to the greater exports to France, the total of foreign rice arrived in and afloat for Europe up to 16th November 1933 being 1133 million pounds as against 751 million pounds in 1932. As export duties to all destinations have been reduced on milled rice and broken by 25 per cent, the export surplus from the last crop would have entirely disappeared by the end of the calendar year. Exports in Siam showed an increase of 10 per cent over those of 1932, exports to Japan, the Netherland East Indies and Europe registering decline while those to the Straits, China, India and the West Indies showing an increase, the total amounting up to end of September to 3,089 million pounds

leaving a balance of 873 million pounds still to be exported. Movement within the country is checked by the prevailing political unrest.

Thus in the three major exporting countries together at the end of October the surplus to be exported may be estimated at about 3,100 million pounds as against 1,700 million pounds in 1932, and taking into consideration the news of the large crop in Burma and the internal situation in Siam, it seems probable that a large surplus will be carried over into 1933.

The Eastern Markets. In India which is the principal importing market, the area sown for the 1933-34 crop is 0.7 per cent. less than in 1932-33. In China the crop is reported to be a good one and the government intend stimulating production by duties on imported milled rice and ultimately making China self-supporting. In Java, the crop harvested this year is 1.8 per cent. smaller than that of 1932 though remaining 3.4 per cent. larger than the average of 1927 to 1931. In Java the monsoon has been favourable and as imports have been controlled since March 1933, reduction in imports from abroad may be expected. Net imports into British Malaya from January to August were five per cent. larger than in 1932. In Ceylon the imports of milled and rough rice in the 9 months ending September were 7 per cent. smaller than in 1932. Production of Japanese territories attained almost the record figure of 1930-31 and the supplies available may be estimated at 789 million pounds larger than in 1932.

The Western Exporters. In all three of the leading minor exporters, the United States, Italy and Spain, production has been smaller this year, in every case there being a considerable reduction in area. In Italy, due to increase in the exports to Germany there will be a decline in the exports to other countries. In Spain the exports in the first 8 months of 1933 were 70 per cent. less than in 1932. An increase in exports from Egypt may be expected and there has been a great drop in exports from Brazil the leading exporter in South America.

The European Markets. Germany has continued to import rough rice in larger quantities than milled rice, exports of milled rice diminishing by 17 per cent. and imports of rice bran being only 32 per cent. of last year's figure. France showed an increase in imports of milled whole rice, flour, and bran. The United Kingdom in the ten month period decreased its total rice imports by 10 per cent. there being a considerable increase in unworked-up re-exports and a decrease in exports of rice milled in the United Kingdom.

General Outlook. A general survey indicated that there will be a large carry over in Burma and Siam at the end of December. In Burma as the indications are for another large crop the surplus for export in 1934 is likely to be a large one and in the three major exporters together the total carry over will be much larger than in 1932. The probability of a normal crop in India in 1933-34 will make the marketing of a surplus more difficult for Burma than in 1933, particularly as China is reported to have a good crop. Japan is faced with very large supplies from its own territories and is likely to re-export in the near future. Amongst the producers of Europe and America there have been reduction in area and control of exports. Italy has assured its position by means of quota agreements, and the market position of Spain is difficult. Egypt is striving for a place in the markets with government assistance. The four importing countries of North-Western Europe have registered a decline in re-exports so that it is not improbable that there will be a falling off in their takings of rice in the near future. Taking the situation as a whole therefore the available information does not give reason to expect any improvement in the rice market; on the contrary the difficulties of international trade in the commodity appear to be augmenting.