

The Madras Agricultural Journal

(ORGAN OF THE M. A. S. UNION)

Vol. XXXI

AUGUST 1943

No. 8.

EDITORIAL

India's Cattle Wealth "Cattle are, in a real sense, the basis of India's economy and the deep and traditional reverence paid to them by so many millions throughout the country has a very real and solid basis" said His Excellency the Viceroy at the annual General Meeting of the All-India Cattle Show Society held at New Delhi recently. Thanks to the deep personal interest evinced by H. E. Lord Linlithgow, the question of improvement of livestock received an impetus in recent years and considerable progress has been attained in many directions relating to the welfare of farm animals. The importance of pedigree in cattle and the necessity for the maintenance of pure-bred stock have been realised; the great possibilities of cattle breeding have been brought home to the cultivator; increasing attention is being paid by Provincial Governments and the Imperial Council of Agricultural Research to questions affecting animal husbandry and organisations like the All-India Cattle Show Society are doing valuable work in the form of propaganda. It must be admitted, however, that these efforts and achievements thereon, though not insignificant have not made a deep impression on the country as a whole, and have but touched the fringe of the problem. The interruption of the steady progress of this valuable work on account of War, though inevitable, is to be deplored. The diversion of the energies of the nation towards matters of more immediate importance, viz, the winning of the war, should not make one forget that when war is over one of the immediate problems to be tackled in India is the rehabilitation of the livestock industry on a rational and economic basis. For, as H. E. the Viceroy remarked, the agricultural prosperity of this land is closely interlinked with its livestock and the neglect of the latter will inevitably lead to adverse repercussions on the former.

The small farmer to-day is faced with serious difficulties with regard to his cattle. Considerable number of work animals have been drawn away from the farm. The reduction in the area grown to fodder owing to more land being devoted to money crops, the high level of prices prevailing for feeding stuffs and the difficulties in transport have all rendered it exceedingly difficult for him to provide adequate rations for his draught and milch animals and maintain them at a proper level of efficiency with the result

that he is in the grip of a vicious circle of poor out-turn in his lands and the selling away of his half famished cattle to the slaughter house.

The first concern of the Government in post-war reconstruction should, therefore, be the replenishment of Indian livestock with high pedigree animals suited to the varying needs of the country. In this connection His Excellency the Viceroy mentioned the possibilities of large scale artificial insemination of livestock with a view to establishing a valued breed in a short space of time. While the possibilities should not be left unexplored, we would like to utter a note of warning at the risk of being dubbed reactionary. In India, the ox, and to some extent the buffalo, is not a single purpose animal not even a dual purpose one. With the exception of certain special breeds as for example the Sindhi, the Indian animal in most parts of the country is an all purpose one. It can be used as a draught animal on the farm and on the road and also as a milch and beef animal, *albeit* on a low level of efficiency compared to the dual or single purpose animals specially bred for the purpose. Experts have not agreed whether it is more economical to have animals bred for different purposes or to have all the attributes blended in one breed, which will, of course, be not an easy task and attainable in the near future. In our opinion, the Indian peasant would prefer to have an all purpose animal and it will be wisdom to respect his prejudices in the absence of an agreed view on the subject by the experts. The mistakes made in earlier years of ignoring his point of view in cattle breeding have resulted in waste of effort and, we hope, that the experience gained in the past will be made use of in planning for the future.

Manuring successive crops of rice with ammonium sulphate and super phosphate

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Introduction In the Tanjore delta which has nearly a million acres under irrigated rice, the rice growers are in the habit of applying ammonium sulphate to their rice crop without the addition of any organic matter. This was particularly so during the post war boom period of 1919-1929, when paddy was selling at Rs 3 to Rs. 3-12-0 a kalam of 64 lb. Later on there were complaints that the yields of rice crop declined in fields that received ammonium sulphate. Invariably such statements were made by persons who applied a bag (80 lb.) of ammonium sulphate to one crop and stopped applying it to the following crop. It might be that the reduction in yield was the result of discontinuance of manuring. There was also no experimental evidence to declare that continued application of an artificial manure like ammonium sulphate really brought down the yield of rice. With a view to find out the effect of continued applications of ammonium sulphate on the rice crop, the following experiment was designed and conducted at the Agricultural Research Station, Aduturai in the Tanjore district for a period of five years from 1935-36 to 1940-41.

Soil and cropping season The soil on the station, is typical alluvial clay of the Cauvery delta which cracks heavily in summer months and sticks badly when wet. It is well supplied with potash but is deficient in nitrogen and phosphoric acid (Harrison and Raghunathaswami Ayyangar). The cultivation season commences by the middle of June, with the receipt of water in the channels fed by the river Cauvery. The first crop which has a short duration of 3 to 3½ months occupies the ground from July to the end of September. The second crop, which is generally a long duration variety of five to six months is planted by the middle of October after the harvest of the first crop, and harvested by the middle of February.

The field where the experiment was conducted had two crops every year. In years previous to the starting of the experiment it received green leaves and bonemeal at 2,000 lb. and 200 lb. per acre respectively at the time of planting, and ammonium sulphate at 50 lb. per acre, fifteen days after planting as a top dressing.

Design of the experiment During the second crop season of 1935 an area measuring 45 cents was selected and laid out into six blocks. Nine manurial treatments mentioned below were tried on each block. In succeeding years and to each succeeding crop the same manures were applied to each plot to the same degree. This experiment was discontinued after taking ten crops in five years. Each experimental plot measured 14 ft. x 20 ft.

giving an area of half a cent. The seedlings were planted in singles spaced 6 in. either way. At harvest one border row of plants, was rejected all round and only the plants inside the plots were used for deriving the yields of individual plots. Each plot had 1053 plants. The manurial treatments were—

- A—No manure
- B—20 lb. nitrogen per acre
- C—30 lb. " "
- D—20 lb. phosphoric acid per acre
- E—30 lb. " " "
- F—20 lb. nitrogen and 20 lb. phosphoric acid per acre
- G—20 lb. " and 30 lb. " " "
- H—30 lb. " and 20 lb. " " "
- I—30 lb. " and 30 lb. " " "

Application of the manure Ammonium sulphate was the manure used to supply nitrogen and concentrated super phosphate was chosen to supply phosphoric acid in all years except in 1939-40 when ordinary super phosphate was used. The requisite quantities of manure were well mixed with an equal quantity of sand to increase the bulk to facilitate uniform distribution and they were sprinkled evenly over each plot just after the final levelling.

The accurate spacing of the seedlings 6 in. × 6 in. in the field was secured by planting them against bold tar markings spaced 6 in. apart on straight bamboo sticks.

The seedlings for the first crop were grown under semi-dry conditions and those for the second crop were invariably raised in wet nurseries according to the local practice. The results obtained in each year from the first and second crops are shown separately below.

TABLE I Percentage increases over control (No manure)

(a) First crop

Years	Treatments									Variety	Duration
	A	B	C	D	E	F	G	H	I		
1936-37	100.0	106.0	116.7	100.2	103.7	116.7	121.7	124.2	125.2	Adt. 12	107
1937-38	100.0	119.9	130.9	105.6	108.7	129.3	130.1	142.1	148.4	3	95
1938-39	100.0	109.4	129.0	114.2	121.0	132.4	133.1	143.9	136.5	9	115
1939-40	100.0	113.3	115.3	110.0	116.0	125.3	124.7	124.0	123.3	12	107
1940-41	100.0	125.5	134.2	111.0	113.0	130.7	130.3	136.6	142.6	4	100
Mean	100.0	114.8	125.2	108.2	112.5	126.9	128.0	134.2	135.2		

(b) Second crop

1935-36	100.0	135.2	149.7	106.1	106.8	133.7	134.5	148.9	149.7	Adt. 2	165
1936-37	100.0	116.7	127.5	103.5	103.5	123.5	126.4	134.7	132.6	2	165
1937-38	100.0	125.3	148.1	102.5	115.5	135.5	135.5	150.6	149.4	11	175
1938-39	100.0	108.2	114.4	107.2	106.2	114.4	115.4	113.4	113.4	8	150
1939-40	100.0	129.2	140.0	103.1	106.2	136.9	136.9	152.3	152.3	8	150
Mean	100.0	122.9	135.9	104.9	107.6	128.8	129.7	140.0	139.5		

In all the years 'Z' test was satisfied. The conclusions obtained each year for the two crops are given below.

	First crop		Second crop
1936-37	<u>I H G F C B E D A</u>	1935-36	<u>C I H B G F E D A</u>
1937-38	<u>I H C G F B E D A</u>	1936-37	<u>H I C G F B D E A</u>
1938-39	<u>H I G F C E D B A</u>	1937-38	<u>H I C F G B E D A</u>
1939-40	<u>F G H I E C B D A</u>	1938-39	<u>G F C H I B D E A</u>
1940-41	<u>I H G F B C E D A</u>	1939-40	<u>H I C G F B E D A</u>

The following conclusions can be drawn from them :—

(a) The average figures for increases show that the application of nitrogen in the form of ammonium sulphate has given both in the first and second crops much bigger increases in yield than the application of phosphoric acid, either in the shape of concentrated or ordinary superphosphate (treatment B & C versus D & E).

(b) Generally speaking, 30 lb. of nitrogen in combination with 20 lb. of phosphoric acid (treatment H) has given about 10 % extra yield over 20 lb. N plus 20 lb. of phosphoric acid (treatment F), but the addition of an extra dose of 10 lb. of phosphoric acid over 20 lb. of phosphoric acid does not seem to have improved the yield in any way (treatment G versus F).

(c) Increases in yield are noticed in all the years of the experiment invalidating the statement that ammonium sulphate does not give increased yields from crops after a year or two.

(d) Continuous application of manures has not produced appreciable cumulative effects in crops of both seasons.

The economic aspect of this system of manuring may now be considered. The following table gives the figures of acreage yield, net increase in yield of grain over control, cost of manure and the profit per acre from the different treatments.

TABLE II
(a) First crop

Years	Acre yield in lb.								
	Treatments								
	A	B	C	D	E	F	G	H	I
1936-37	2600	2756	3034	2608	2699	3034	3163	3228	3279
1937-38	2217	2671	2906	2347	2417	2879	2897	3161	3306
1938-39	2596	2842	3351	2965	3133	3439	3456	3737	3544
1939-40	2653	2997	3052	2918	3071	3315	3309	3282	3265
1940-41	2176	2724	2921	2416	2459	2843	2900	2973	3102
Average	2448	2798	3053	2651	2756	3102	3145	3276	3299

(b) Second crop

1935-36	1712	2316	2560	1816	1829	2288	2301	2549	2560
1936-37	1872	2183	2380	1934	1934	2308	2362	2518	2479
1937-38	1386	1747	2056	1429	1617	1888	1886	2103	2088
1938-39	1702	1842	1947	1824	1807	1947	1964	1930	1930
1939-40	1144	1491	1609	1182	1215	1571	1571	1756	1756
Average	1563	1916	2110	1637	1680	2000	2017	2171	2163

TABLE III Statement showing the average increase in yield, cost of manuring and the net profit obtained per acre

		First crop							
		B	C	D	E	F	G	H	I
Average increase over no manure per acre	} lb.	350	605	202	308	654	697	828	851
Average value of increased produce	} Rs. A.	10-14	18-4	6-6	9-8	19-11	20-14	24-9	25-5
Average cost of manuring per acre	} Rs. A.	5-7	18-2	3-6	5-1	8-12	10-7	11-8	13-2
Net profit over control		5-7	10-2	3-0	4-7	10-15	10-7	13-1	12-3
		Second crop							
Average increase over no manure per acre	} lb.	353	547	74	117	437	454	608	599
Average value of increased produce	} Rs. A.	11-2	17-3	2-5	4-7	13-13	14-5	19-2	18-14
Average cost of manuring per acre	} Rs. A.	5-3	7-13	2-11	4-1	7-15	9-5	10-9	11-14
Net profit over control		5-15	9-6	0-6	0-6	5-14	5-0	8-9	7-0

Data for calculating the profit and loss account

		35-36	36-37	37-38	38-39	39-40	40-41
Cost of ammonium sulphate per lb.	Rs.	0-0-9	0-0-10	0-0-9	0-0-11	0-0-11	0-0-11
Cost of concentrated super phosphate	Rs.	0-0-9	0-0-11	0-0-9	0-1-0	—	0-1-7
Cost of ordinary super phosphate	Rs.	—	—	—	—	0-0-5	—
Sale price of paddy kuruvai per 64 lb.	Rs.	—	1-6-0	1-10-0	1-14-0	2-0-0	2-8-0
Do. samba	Rs.	—	1-14-0	—	—	—	—
Do. sirumani	Rs.	2-0-0	1-12-0	—	2-4-0	2-6-0	—

Conclusions The figures given above bring to light the following:—

(a) The first crop is more responsive to manuring with the above manures than the second crop, the maximum increase in yield of grain due to manuring being of the order of 850 lb. an acre as against 600 lb. in case of the second crop.

(b) From the economic point of view it is clear that it is worthwhile manuring both the first and second crops and realising a profit of Rs. 10 to Rs. 13 an acre.

(c) It is not remunerative to manure the second crop with super-phosphate only.

(d) The most remunerative dosage is 30 lb. of nitrogen plus 20 lb. of phosphoric acid per acre. 30 lb. nitrogen also gives almost the same

yield but it is not advisable to supply nitrogen only, especially on soils as of Tanjore delta which are very deficient in phosphoric acid.

(e) For the second crop, application of ammonium sulphate to supply 30 lb. nitrogen per acre alone seems to be profitable but it is preferable to add 20 lb. of P_2O_5 to keep the soil well stocked with this valuable plant food.

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Economies in Feeding Cattle

By V. T. SUBBIAH MUDALIAR

The prices of commodities have risen considerably of late, particularly during the last twelve months. In certain cases the rise is phenomenal, so phenomenal as to be almost incredible. The rise in prices is also general and all classes of commodities are affected to a greater or lesser degree. Neither the rise in prices nor the factors conducive to such rises are in the control of individuals, but wise and judicious spending is in the hands of the discriminating people. It is becoming increasingly important to be extremely circumspect in choosing the right type and quantity of the various commodities for purchase. This choice is the problem today that confronts people with limited incomes, including agriculturists.

Cattle feeds are registering unprecedentedly high price levels, in common with other articles. Many of the common and usual feeds are getting scarce and costly. These may be the result of restricted transport facilities or of diversion of productive activity to more profitable fields or diversion of commodities for other and new uses. Early in 1940, the market for groundnut was cut off by the war and the farmers had in their hands large stocks of groundnut. Other crops could not satisfactorily replace groundnut in the prevailing system of cultivation. The same war has since come to the rescue. The conditions created by it found new uses for groundnut—kernels, oil and cake. The high prices of agricultural produce stimulated the use of manures for paddy and other crops. The import of fertilisers dwindled and people turned to groundnut cake for manuring the fields to a greater degree. The high prices of produce made manuring, even with costly manures, an economic proposition and certainly not uncertain as heretofore. Groundnut cake was selling at about Rs. 30 a ton early in 1940, at Rs. 60 in 1942 and is now at about Rs. 150 a ton. The peasants who maintain cattle find it increasingly difficult to feed the animals with concentrated feeds at the present high prices. The prices of other feeding stuffs also are on the upward trend. Cotton seed, sold at about Rs. 60 a ton early in 1942, is now selling at Rs. 240 a ton. One of the problems of the day for the cultivator is the feeding of his animals with concentrates. Is he to continue to feed his animals with concentrates priced so high and would it pay? Or alternatively is he to stop feeding

concentrates and allow his animals to lose condition, fall down in draught capacity and give a diminished milk supply from cows? Obviously he cannot afford the one or the other. The solution that naturally suggests itself is that the peasant substitutes the purchased feedstuffs by home grown material, as far as possible and they are not so costly. The feeding stuffs grown in the farm will automatically reduce the area under other crops, apparently more remunerative. But the area that is required for the growing of the feed stuffs is only limited and the loss of other produce from this area is not likely to be greater than the cost of the concentrates that have to be purchased in the open market.

Concentrated feeds aim at supplying animals with fats and proteins. The fats and carbohydrates in feed are interconvertible in the animal system and a deficiency of one can be made up by the other within limits. At the same time it must be remembered that the composite feed must have a certain amount of fat. Normally provision has to be made for an average supply of 4 per cent of fat in the composite feed for the milch animals.

Proteins supply nitrogen for the metabolism in the animal system and proteins have necessarily to be supplied to the fullest extent. The deficiency of proteins in the feed could not be made up by other ingredients in the feed and there are no short cuts as far as protein feeding is concerned. Protein also happens to be the costliest nutrient in animal feed. Attempts have therefore to be made to grow protein-rich feed in the farm itself with the object of cutting out the purchase of protein feed. There are a number of crops that give protein-rich produce and the leguminous plants take priority among them, with the capacity to assimilate atmospheric nitrogen and fix it in their tissues—capacity not usually possessed by other plants. The crop chosen should preferably be capable of growing luxuriantly and giving a large produce.

Lucerne and sweet potato crops are suggested as being suitable for this country, for supplying protein feed for the farm animals. Both are rank growers giving a good tonnage of fodder and contain good quantities of protein.

Lucerne is a leguminous crop that stands repeated cuttings throughout the year. It makes rapid growth, particularly during the cold weather and is capable of giving upto 60,000 lb. of green fodder per acre annually. A moderate crop would give 40,000 lb. of green feed, equal to 10,000 lb. of hay, having a protein equivalent of 4,000 lb. of groundnut cake or of 12,000 lb. of cotton seed; $2\frac{1}{3}$ lb. of lucerne hay supplies as much protein as 1 lb. of groundnut cake. Lucerne hay can largely replace groundnut cake, but it is not desirable to cut out the cake altogether. Lucerne hay can be safely given to cattle upto a maximum of 10 lb. a day. As a precautionary measure, lucerne hay may be fed however at 2 lb. per day per animal to start with and increased gradually. Green lucerne may also be given to animals, but large quantities are apt to promote tympany and the hay is comparatively a safer feed, especially at the higher levels, where lucerne meets the major part of the protein requirements of animals.

Sweet potato is a common tuber crop. It makes vigorous growth. The young vines are succulent and contain 2.58 % of proteins, equivalent to 19 % on a dry basis. 20 lb. of green vines a day would supply as much protein as one lb. of groundnut cake or 3 lb. of cotton seed. The vines have a tendency to loosen the bowels of animals, when fed in large quantities and could not therefore replace the concentrates entirely. The vines are good green feed, apart from the protein value, and the inclusion of sweet potato vine in the dietary of cattle is an advantage.

Dairy animals at the Agricultural College, Coimbatore are fed with sweet potato vines up to 50 lb. a day especially in summer, when other green feeds are scarce. Even such large quantities do not produce any ill effects on the animals. The vines are relished by cattle and are eaten greedily.

Sweet potato vines could be cut two months after planting and three cuttings could be had by the time the crop is six months old. Fifty to sixty thousand pounds of green vines could be had during this period, from an acre, i. e., the protein equivalent of 2,500 to 3,000 lb. of groundnut cake or 8,000 lb. of cotton seed. The crop would also give 6000 to 8,000 lb. of poor quality tubers, which may be boiled and fed to cattle. Two crops could be grown in an year, one following the other.

Lucerne and sweet potato are only two of the possible substitutes for the concentrates. Most of the leguminous hays are valuable cattle feed. It may be possible to introduce a short duration legume hay crop as an addition in the existing system of cultivation. The Circars ryot is growing a hay crop of Sunhemp in summer in the wetlands, utilising the moisture in the soil. Something similar may be possible in the other localities. A little preliminary planning and suitable modifications in the existing system of cultivation is all that is necessary for solving the problem for the individuals. The analysis of some of the common feeding stuffs given under might possibly be suggestive.

Name of material	Analysis on original moisture basis				Analysis on a dry basis		
	Original moisture	Crude protein	Fat	Carbo-hydrates	Crude protein	Fat	Carbo-hydrates
Cotton seed	10.00	16.22	18.53	27.88	18.02	20.60	30.98
Groundnut cake	12.50	46.31	7.19	23.57	51.75	8.22	26.94
Gingelly cake	12.50	40.51	8.67	24.37	46.30	9.91	27.85
Babul pods	10.00	14.19	0.79	58.97	15.77	0.88	65.52
Lucerne hay	10.00	19.13	1.27	31.66	21.26	1.41	35.18
Green lucerne	80.00	4.46	0.30	10.06	22.30	1.50	50.31
Sweet potato vines	86.42	2.58	0.32	4.65	19.00	2.36	33.93
Sunhemp hay	10.00	13.39	1.04	29.89	14.88	1.16	33.21
Groundnut haulms	10.00	9.66	0.79	29.17	10.73	0.88	32.41
Agathi leaves	75.00	8.89	0.56	11.75	33.56	2.23	47.00

Would the progressive farmers try these suggestions and induce their neighbours to do likewise? This will effectively meet the challenge of the present high prices of feeding materials.

Note on the cultivation of maize for cobs

By A. SANKARAM, B. Sc. Ag.

Maize is primarily a grain crop grown extensively all over the world. In the Northern Circars, it is grown mainly as a fodder crop. Of late however, it is being cultivated for its green cobs, especially near towns. The local people have cultivated a taste for the green cobs and there is a steady, though limited, demand for the cobs in the market. The area devoted to the cob-crop is not negligible, being about 100 acres even about the neighbourhood of a small town like Anakapalli. After the removal of the cobs, the stalks are cut and fed to cattle. They are particularly valuable for the milch cattle. The maize cob-crop is cultivated in the Circars as follows.

Soil Maize comes up well in almost all classes of soils, and particularly well in good loamy soils. It is also grown in clayey loams in wetlands that have supplemental irrigation facilities from wells, provided the soil is well drained.

Rotation Maize is grown in rotation with brinjals and *bhendai* in garden lands. It follows onions or *Pyru* gingelly in wetlands. It is grown mixed with red gram in dry lands. Occasionally maize and brinjals are broadcasted together as a mixture. After the harvest of maize, the brinjals left behind are manured heavily. Sometimes sunhemp is broadcasted in the standing maize, when it is about six weeks old. After the harvest of maize, the sunhemp is ploughed in as green manure.

Preparatory Cultivation Maize responds to good cultivation and manuring. A good tilth is secured by ploughing the land repeatedly—6 to 8 times—with a wooden plough. Well-rotted cattle manure is applied to the land at 15 cart-loads per acre and this is supplemented by penning 2,000 sheep. Ten cart-loads of wild indigo leaf are also applied in addition to cattle and sheep manure, when it is proposed to take a crop of brinjals after maize in garden lands.

Season The sowings are made from March onwards, under well irrigation. In dry lands, the sowings are done with the South-West monsoon showers in June. Sowings are done periodically, in batches, to facilitate the tender cobs being put in the market continuously from June to October. Maize is not raised during the cold weather, as the cob formation and filling are then defective.

Seed and Sowing Good sized and well filled cobs are left to mature on the plant. The cobs are harvested, dried in the sun and shelled. The seeds are stored in tins or mudpots, with a layer of ashes at the top. The mudpottis covered with a cloth and sealed with mud and cowdung plaster to prevent damage by pests of stored seed.

Broadcast sowing is the usual practice. The seed rate is 10 lb. to the acre. The cobs are not good sized, if a higher seedrate is adopted. The seeds are also dibbled in the plough furrows, sometimes. After the seeds are covered, beds 8 ft. × 8 ft. are formed with irrigation channels in between every two rows of beds. In mixed crop sowing, red gram is first broadcasted and maize is dibbled in the plough furrows, using 2 lb. of red gram seed and 8 lb. of maize to the acre. Red gram and maize are also sown in lines with *akkadi*, with one line of red gram for every three lines of maize.

Irrigation . Early crops sown in March and April are given about five irrigations. Crops sown in June come up with three irrigations. In North Vizagapatam, where the South-west monsoon is heavy, dry crops of maize are raised.

After cultivation After the sprouts appear, the gaps are filled by dibbling and hand-watered. Weeding is done 20 days after sowing, when the crop is 6 to 8 inches high, followed by a hoeing and thinning, a week after. The third weeding is after another fortnight. Birds which damage the cobs, are scared by boys by tapping empty kerosene tins with small sticks. Night watch is provided, where the crop is subject to damage by jackals.

Harvest The duration of the crop is 100 to 120 days. Tender cobs begin to form from the sixth week after sowing and are ready in another two weeks. The tender cobs are relished by most of the people, but the labouring class prefers the mature cobs, as being more sustaining. As the crop is sown in batches one after the other, the harvest is done in stages, as the cobs get ready. The *ryots* arrange their sowings so that they may have 2 to 3 cents of the crop ready for the daily harvests during the season, and this is managed without any additional labour being engaged for the purpose. Each plant gives one cob, while a few bear two cobs and some are infructuous. The early crops give about 13,000 cobs from an acre and the main season crops give about 14,000 cobs. After the harvest of the cobs, the entire crop is cut and fed to cattle. 3,000 to 4,000 lb. of green feed is had from an acre.

Marketing The tender cobs become available from June onwards; the peak supplies are from July to September and there is a good demand for the green cobs in the local market. The *ryots* either sell the standing crop at Rs. 50 to Rs. 70 per acre or attend to the harvest and sell the green cobs to the dealers at Rs. 3—12—0 to Rs. 5—8—0 per thousand cobs. The cobs are retailed at 12 annas to a rupee per hundred, i. e., at Rs. 7—8—0 to Rs. 10 per thousand. The returns are disproportionately shared by the grower and the merchant, each receiving about 50% of the prices realised.

The roasted tender cobs is a common favourite with all classes of people. The cobs obtained from the dry crops are said to be better than the others. Though the cobs are tasty and appetising, they are not easily digested by people accustomed to a soft rice diet.

The Economics of cultivation The cost of cultivation and the profits that may be expected normally are given below :—

Items of cultivation	Early crop (April)			Late crop (June)			Dry Crop (June)		
	Rs.	As.	Ps.	Rs.	As.	Ps.	Rs.	As.	Ps.
Preparatory cultivation ...	8	0	0	8	0	0	8	0	0
Manures and manuring ...	15	0	0	15	0	0	5	0	0*
Seeds and sowing ...	1	0	0	1	0	0	1	0	0
After cultivation ...	3	4	0	3	4	0	3	4	0
Irrigation ...	12	8	0	7	8	0			
Harvest ...	2	8	0	2	8	0	2	8	0
Assessment, scaring birds, etc. ...	2	12	0	2	12	0	2	4	0
Total cost of cultivation per acre	45	0	0	40	0	0	22	0	0
YIELD									
Marketable cobs per acre ...	13,000			14,000			10,000		
Value per thousand cobs ...	5	8	0	4	8	0	4	8	0
Total value of cobs ...	71	8	0	63	0	0	45	0	0
Fodder produced in lb. ...	3,500			4,000			3,000		
Value of fodder ...	5	4	0	6	0	0	4	8	0
Total receipts per acre ...	76	12	0	69	0	0	49	8	0
Net profit	31	12	0	29	0	0	27	8	0

* Sheep are penned in the dry lands and no cattle manure is applied normally.

Conclusion The area devoted to this crop by individual *ryots* ranges from 50 cents to $1\frac{1}{2}$ acres. Maize grown for cobs is a short duration remunerative crop, requiring only a small investment. Hence the cultivation of maize for the green cobs can be advantageously taken up in localities adjoining towns.

The Madras Agricultural Students' Union

Annual general body meeting 1943.

The annual general body meeting of the Madras Agricultural Students' Union was held on Friday 30th July 1943, at 6 P. M. in the Freeman Hall with Mr. N. L. Dutt, the Vice president, in the chair. Fifty four members including thirty two student members were present. The minutes of the previous general body meeting were read and adopted. The Secretary then read the report of the Managing Committee for the year 1942-43, which was adopted unanimously. The report of the auditors in respect of the accounts for the year 1942-43 and the draft budget for the year 1943-44 were then taken up for consideration. Proposed by Sri Rao Bahadur V. Ramanatha Ayyar and seconded by Sri C. S. Krishnaswami Ayyar (Mycology) it was resolved that the excess expenditure over the sanctioned budget estimates of last year incurred by the Committee, may be ratified, in view of the abnormal conditions created by war. It was then suggested that this matter should form one of the subjects to be included in the Managing Committee report. As regards Rs. 100 tender deposit shown in the balance sheet, under funds and liabilities, the Committee were requested to refer the same to the auditors with the concerned voucher for necessary modification in the balance sheet. Sri Rao Bahadur V. Ramanatha Ayyar, proposed and Sri C. S. Krishnaswami Ayyar (Mycology) seconded, that the College Day and Sports be held during the year 1943-44 and a sum of Rs. 250 be provided under

expenditure for the same as against an estimated receipt of Rs. 200 by donations from members'. This was adopted by the general body with acclamation.

The President then announced that the Ramasastrulu Munagala prize was awarded to Sri P. A. Srinivasan, student B. Sc. Ag., III for his essay on "An Economic Survey of the Marketing of Tobacco at Palghat".

The election of office-bearers for the year 1943-44 was then proceeded with. The Vice-President announced the names of those who were elected to the offices of Vice-President, Editor and Secretary by ballot, as follows:—

Vice-President:—	Sri C. Ramaswami Nayudu.
Editor:—	Sri C. R. Srinivasa Ayyangar.
Secretary:—	Sri K. Ramaswami.

The following office bearers were then elected (duly proposed and seconded).

The council: Mofussil Vice-Presidents:—Sri R. Swami Rao, Sri M. Kantiraj, and Sri M. Anandan.

Mofussil members:—Sri M. Narasimham, Sri M. Royappa Pillai, Sri M. R. Balakrishnan and Sri M. Kalimuthu.

Resident members:—Dewan Bahadur Sir T. S. Venkatraman, Sri Rao Bahadur G. N. Rangaswami Ayyangar, Rao Sahib V. Muthuswami Ayyar, and Sri E. R. Chellam Vincent.

Managing Committee:—

Manager:—	Sri C. Balasubramaniam.
Treasurer:—	Sri C. S. Krishnaswami (Agricultural Section).

Other members:—Sri A. Mariakulandai, Sri M. M. Krishna Marar, Sri S. V. Duraiswami Ayyar and Janab Ibrahim Ali Sahib (Student).

Editorial Board:—Sri C. M. John, Sri V. T. Subbiah Mudaliar, Sri Rao Bahadur V. Ramanatha Ayyar and Sri P. A. Srinivasan (student).

After the vote of thanks proposed by Sri Rao Bahadur V. Ramanatha Ayyar to the retiring committee, the meeting terminated.

General body meeting of the resident members.

Sri C. R. Srinivasa Ayyangar and Sri K. Ramaswami, who were elected as Editor and Secretary respectively, at the last annual general body meeting expressed with regret their inability to accept the offices. A general body meeting of the resident members was therefore convened on 12th August with the Principal in the chair. Sri V. T. Subbiah Mudaliar and Sri N. Muthuswami Naidu were elected as Editor and Secretary respectively. In the vacancy caused by the election of V. T. Subbiah Mudaliar as Editor, Sri T. Nataraj was elected as a member of the Editorial Board.

Report of the Managing Committee of the Madras Agricultural Students' Union for the year 1942-43

The Managing Committee of the Union beg leave to present the following report of the activities of the Union for the period 1st June 1942 to 31st May 1943.

Membership The number of members on the roll on 31st May 1943 was 515, as against 512 in 1942 and 496 in 1941. Though there has been a slight increase in membership, a large number of officers of the department and ex-students of the college are still not members.

Office bearers The Principal Mr. P. V. Ramiah continued to be the ex-officio-President throughout except for a period of six weeks when he was appointed acting Director of Agriculture. During this period Mr. C. R. Srinivasa Ayyangar was the Principal and the President.

College Day and Conference for 1942 Owing to conditions created by war and the absence of deputation of district officers, it was decided to postpone the holding of the College Day and Conference for the year 1942, till circumstances are favourable for the holding of the same. The College Day Sports, however, were held on Saturday, 30th January 1943. The function was a great success and in four events new records were set up. Our thanks are due to Mrs. C. R. Srinivasa Ayyangar who very kindly gave away the prizes. Thanks are also due to Sri A. Mariakulandai and other members of the sports committee for their active co-operation in arranging and conducting the sports. As regards the College Day and Conference of 1943 we regret that it has once again not been possible to hold the same.

Managing committee meetings Eleven meetings of the Committee were held during the year.

Editorial Board meetings There were 14 meetings of the Board. Our thanks are due to Sri C. M. John, Editor and the members of the Board for the efficient conduct of the journal during difficult times.

The Madras Agricultural Journal Owing to increased cost of printing and the difficulty of obtaining paper of the requisite quality, the committee were constrained to reduce the number of pages of the journal to about 30 pages of reading matter with a view to restrict the cost of production within the limits of the sanctioned estimate. In addition, cheap cover paper was also introduced. We hope the journal will revert to its old standard as soon as conditions improve. The students' annual supplement was published along with the June issue. We wish to record here our appreciation of the co-operation and promptness of The Scholar Press, Palghat. We thank the Department of Information, New Delhi, for the supply of numerous blocks concerning war subjects and we dare say the publication of such pictures has enhanced the interest in the journal. We wish particularly to express our grateful thanks to the Government of Madras and the Director of Agriculture for the annual subsidy of Rs. 400 which has been very helpful under the present high cost of production of the journal.

Subscribers The number of subscribers to the journal, who are not members of the Union, at the end of the year was 230 as against 227 in 1942, and 211 in 1941.

Exchange and free list The list is being maintained and copies of the journal are being reserved for despatch overseas as soon as shipping conditions improve.

Ramasastrulu-Munagala Prize Two essays were received for this prize and the judges appointed in this connection recommended the award to Sri P. A. Srinivasan, student, class III who sent in the essay on "An Economic Survey of the Marketing of Tobacco at Palghat". We take this opportunity to congratulate the author of the essay and to record our thanks to the judges. It may be recorded that this is the first time that a student has been awarded the prize.

Extension to the Union building The total expenditure under improvement to building came to Rs. 897-11-0 as against Rs. 875 provided for in the budget, for the year under report. The increase is due to the high cost of timber etc. used for the making of racks and other equipment intended for the new hall. Our thanks are due to the previous Secretary Sri V. Gomathinayagam Pillai for the ungrudging services rendered by him in this connection.

Acknowledgement The committee record their grateful thanks to all members of the Union for their valuable cooperation and to the Presidents of the year Measrs. P. V. Ramiah and C. R. Srinivasa Ayyangar for their ready help and valuable advice at all times.

SELECTED ARTICLE

Short Term Rubber Plants

Tropical rubber production has always depended on long term perennial plants. Wild rubber has, in Africa, been obtained from members of the family *Apocynaceae*, especially the lianes and shrubs of the genus *Landolphia*, while the cultivated rubbers have been trees belonging to the family *Euphorbiaceae*. The present reduction in supplies of rubber from the latter source has naturally directed attention to the possibility of obtaining rubber from plants that can be grown quickly and utilized at a comparative early age. These requirements limit consideration to plants that are herbs or small shrubs.

In the search for such plants the Soviet Union has taken the lead. In 1931—1934 thirty expeditions were organized in the Soviet Union to search for rubber-containing plants. Over a thousand species were examined, of which 609 were found to contain rubber or rubber-like substances. Only a few of these were thought suitable for cultivation including guayule (*Parthenium argentatum*), kendir (*Apocynum venetum*), vatochnik (*Asclepias cornuti*) and some plants belonging to the genera *Scorzonera* (tau-saghyz), and *Taraxacum*, (krym-saghyz and kok-saghyz). Of these by far the most important, both actually and potentially, are the first and the last, both members of the family *Compositae*, to which belong the familiar dandelion (another *Taraxacum*) and daisy.

Guayule, which is a shrub, has already received a good deal of publicity because it has been established as a commercial crop in California for some years. An immense expansion will now take place under a government scheme just sanctioned for production in the south-western U. S. A. The home of the plant is in Mexico, between latitudes 20° and 28°N., at altitudes of 3,000 to 7,000 ft. in a dry climate. The soils it favours contain a large percentage of lime. The rubber is contained in isolated cells mostly in the bark of the roots, stem and branches, but since latex cannot be induced to exude, the whole plant must be mechanically treated.

Indications are that good crop land will prove most suitable to guayule production. Rainfall of only eight to twenty inches a year seems sufficient for normal yields, provided that little or none of it occurs during the summer season, when rains discourage rubber accumulation in the plant. Except for certain seedling diseases and root rot in some areas, the plant appears to be rather resistant to insect and disease enemies. The guayule plants are cultivated like corn, four times the first year, three times the second and third years, then twice the fourth year. Harvesting is confined to the so-called dormant period when the rubber content of the plant is greatest.

Research financed by private enterprise has isolated strains with a relatively high rubber content that are now in cultivation by highly mechanized methods. Seed germination seems naturally low, only about 5 per cent, but by treatment this can be improved until there are but few failures. It was at first stated that while rubber could be obtained at two years old, four to six years was regarded as the best age. Later, as a result of selection and improved cultural treatment young plants less than a year old were claimed to contain "63 per cent of pure caoutchouc on a bone-dry deleafed basis" a yield equivalent to 1,164 lb. per acre, and it was thought possible to produce as much rubber per acre in two years as was formerly counted on in four years. The latest reference available quotes the yield of rubber at four years old as 20 per cent of the dry weight of the shrub, with a resin content of 16 per cent in the extracted rubber.

On harvesting the shrubs are pulled, chopped, thoroughly dried and crushed—all, like the planting and cultivation, by highly mechanised methods before being conveyed to continuous-feed tube mills. After repeated disintegrating and washing of the plant debris the rubber agglomerates into pieces up to the size of a pea, which can then be separated by flotation. Laboratory analysis shows that by these methods only 25 per cent of the rubber present in the shrub fails to be recovered. When deresinated the rubber is said to be a perfect substitute for high grade plantation rubber.

Attempts are being made to get seed of guayule for trial in East Africa, but the soil, climate and length of day in its native country being what they are, the chances of its being grown successfully in East Africa are not great.

Taraxacum kok-saghyz, the herbaceous plant producing most of the Soviet Russian natural rubber, is native at 7,000 to 8,000 ft in the Tian-Shan. The cultivated plant fructifies at the end of the first year of growth, and may then be used for obtaining rubber, which is localized in the roots in the form of long filaments. Selection is proceeding with the object of transforming cultivated strains from fibrous-rooted into thick-rooted plants with high yields and an improved rubber content in the second year. The rubber is obtained by reducing the roots to a fine powder which is macerated in water. The rubber, which then separates out by gravitation, is of satisfactory quality, though not equal to *Hevea*. The record yield obtained is about 200 lb. of rubber per acre.

Although the natural habitat of kok-saghyz is on alkaline soils it will grow on soils with a pH as low as 4.5. In Russia germination is secured in 4-5 days instead of 40-50 by keeping the seed before planting at freezing point and well moistened. On mineral soils about 2 lb. is sown to the acre, and preferably after a crop that has received both organic and mineral manures. The best root growth is obtained on peat soil that have been limed. Careful cultivation is necessary, at first to keep weeds down and later to maintain good aeration.

The prospects of kok-saghyz being a satisfactory source of rubber in East Africa are probably negligible. None of the environmental factors of the areas in which it is native or successfully grown in the Soviet Union are available here. Over a hundredweight of seed has recently been sent by air from Russia to Minnesota, where it is expected to do well with an annual rainfall of 20 inches and a hard winter.

The second most promising rubber plant in Russia is *Taraxacum megaliarhizon* which contains a very high quality rubber superior even to *Hevea*, but in only small quantities. It is disappointing to find that the 6 per cent content of the roots in the wild plant drops to less than 1 per cent in the cultivated.

In *Apocynum venetum* and *Asclepias cornuti* the rubber is localized mostly in the leaves, which may contain up to 10 per cent, apparently of rather poor quality. In the former plant the stems are cut twice a year and on the figures quoted the yield per acre may vary from about 20 to nearly 400 lb.—R. E. M.—*E. Afr. Agric. J. Oct. 1942.*

Gleanings

World's milk record In the United States, a nine-year-old Holstein—Friesian cow named Carnation Ormsby Madcap Fayne, set a new world's record for milk production.

Each day Carnation Ormsby Madcap Fayne (Capper for convenience) gave 55 quarts of milk. Each 15 days she produced her own weight in milk. Each month she produced almost as much as an average cow would produce in a year. At her peak, Capper averaged over 140 lb. daily for 20 days running. One day she responded with 146.5 lb.—approximately 70 quarts (wine measure).

On the last day of her test Capper gave enough milk to bring her year's total up to 41,943.4 lb.—*Dairy News Letter (Indian Farming, March 1943.)*

Test for over-polished rice In a number of tests carried out to find a method by which undermilled rice can be distinguished from over-polished rice, it was found that iodine solution of 0.05 per cent strength turns the polished rice grain to blue-black in 60 seconds, while the same solution gives rise to streaks of blue-black colour on rice that is under-polished.

It was seen that rice passed twice through the huller turns blue-black while rice passed once shows only streaks of blue-black, indicating thereby that the bran layer has not been completely removed. It has been found that a single milling is enough to produce good cooking quality in rice. The above test will be of use to distinguish the undermilled from the highly polished rice, when the state regulates the degree of polishing of rice, so that 4 to 5 per cent more of rice stocks could be obtained by undermilling. (*Indian Farming, March 1943.*)

Hints for Bee-keepers

For September, 1943.

Unfavourable weather and pasturage conditions continue during the current month also, but show a tendency to improve towards the latter half of the month if there is timely receipt of rains. Pollen is collected from a variety of crops such as maize, castor, babool, gingelly, cumbu, *Ailanthus excelsa*, safflower, niger, zinnia, sunflower, and *Mimosa pudica*; and a scanty supply of nectar is available from gingelly, cucurbitaceous plants, safflower, niger, balsams, white babool, sunflower and *Chionachne kosnigi*. Breeding continues to be poor and the bee enemies also are active. The hints regarding the upkeep of the colonies during the slack season, control of bee enemies etc., given in the previous issues should be carefully followed. Better bee activity is, however, evinced during the second half of the month, if the usual rains are received in time. As the prosperous season is likely to commence from the next month onwards, the period will be quite opportune for one to increase his stock. It would therefore be advantageous to make the necessary bee-appliances before hand and keep them ready. The minimum equipment necessary for starting a new Apiary will be about half a dozen hives, a honey extractor, a drone trap, a piece of queen excluder sheet, a bee-escape and a few sheets of comb foundation. These may either be made locally according to the specifications given in the Bulletin No. 37, Department of Agriculture, Madras or the local Agricultural Demonstrator or the Government Entomologist, Lawley Road P. O., may be addressed on the matter.

M. C. Cherian & S. Ramachandran.

Correspondence

Grow More Food Campaign—Some suggestions

To

The Editor, The Madras Agricultural Journal.

Sir,

In these days of war, the necessity of an increased yield of agricultural produce is vitally important. The Grow More Food Campaign launched by the Government has stressed the need of raising food crops in all available land. It is deplorable that the propaganda now carried on, is confined only on the theoretical side. The practical aspect of the problem is not receiving due attention. In the course of this letter I propose to give some suggestions, which if carried out would relieve economic hardship.

At present the Revenue and National War Front Officials are doing the propaganda work. Food-Grain-Purchase Officers are recruited from the Revenue Department. These officers cannot be expected to tackle the practical side of the problem. If Agricultural Officers are appointed they will be able to deal with the practical side of the problem, and can avoid waste by storage etc. Moreover the present strength of the Agricultural Department is quite inadequate for the purpose. In peace-time, when food shortage was not so keenly felt, it was sufficient to have a Demonstrator for each taluk. But now each revenue *firka* must have a demonstrator who must be asked to frequently visit all the villages and advise the *ryots* on the cultivation of their lands.

He can easily get hold of a land-lord who may be willing to cultivate his lands under his supervision. His yield from the land must naturally be greater than that of previous years. The other *ryots* would find that he gets a bumper crop and would naturally copy his methods of cultivation with the result, maximum yield is got from all the land in the village.

The practice of frequent transfer of Agricultural officers and placing more districts under the control of one District Agriculture officer is greatly to be regretted. The study of the conditions of the locality and the drawbacks of the local practices of cultivation take a long time. In the interest of the Agricultural development these officers should not be frequently transferred from one place to another.

Statistics reveal that the yield from land could be increased by 10% by sowing good seed. A further 5% yield could be secured by the application of scientific manure. At present the *ryots* experience during cultivation season, great difficulty in getting good seeds and manure. Even if they are available the merchant demands a high price for the manure. Since the price demanded is so exorbitant the *ryot* is obliged to cultivate his land with an insufficient quantity of cheap manure. As a consequence he gets a poor crop.

The Demonstrators in each *firka* must be asked to stock manure, and good departmental seeds. They must advance manure and seed to the *ryots* with the assistance of the Village Officers, during cultivation season. The *ryot* being poor is not able to stock manure for the next crop at a time when the price of manure is low. It will indeed be of great help to the *ryot* if the Agricultural Depots stock manure when it can be had cheaply, and supply him his requirements. The *ryot* may be asked to pay its cost either in kind or in cash. He can be asked to supply the Depot his produce towards its cost. The Railway authorities also must afford facilities for the transport of manure at a concession rate.

In the matter of stocking and supplying of manure the Co-operative Department must step in and afford to the *ryots* all possible aid. The co-operative societies may be asked to stock manures when their prices are low and distribute them to the *ryots*, charging a small profit. But the co-operative stores that stock manure at present do not have the *ryots'* welfare in view and are charging them heavy prices, just like the hoarding merchant who blackmarkets his goods. The attention of the Registrar must be drawn to this fact, so that he may be pleased to direct the co-operative stores and societies not to charge excessive profits on such items as are indispensably necessary to the *ryot* to secure the maximum yield from his land. Any amount of propaganda can be of no avail, unless the means whereby he can increase his yield are made available to the *ryot*.

In these days of economic dislocation, hoarding is prevalent everywhere and stocks of paddy are not released by the landowners. Government control cannot effectively check this evil. Every *ryot* would try to get the maximum price for his produce. The present control price of paddy is very low considering the heavy rise of prices of other articles and rise in wages. It is but just that the prices of food-stuffs are revised according to the increased rates of wages and cost of living. The services of the Agricultural Officers may be requisitioned for the determination of the price, after due consideration of the cost of cultivation and the reasonable margin of profit to be left to the *ryot*. The Agricultural Officers will be able to supply statistics from the Government farms regarding cost of cultivation etc. When a fair price is fixed, naturally *ryots* will release their stock of paddy and there will be no inducement for hoarding, and the excess of paddy that each *ryot* has would be made available to the general public and food scarcity would be relieved.

I am sure that if these suggestions mentioned above are carried out, it would go a long way in ameliorating the lot of the poor *ryot* and the general public as well.

Ilanji, Tenkasi, }
July 19, 1943. }

(Sd.) I. S. Kuttalalingam

MANURE FROM TOWN-WASTES

Training Course for Biochemists at Bangalore

(From a correspondent)

Sir,

The training course for biochemists deputed by different Provinces and States in India in the improved process of preparing compost manure from town wastes developed at Bangalore, was formally inaugurated at the Indian Institute of Science, Bangalore, on the 4th August 1943. It may be recalled that the Government of India recently sanctioned a sum of nearly Rs. 2½ lakhs for a programme of large scale preparation of compost manure from town wastes, the scheme to be worked under the auspices of the Imperial Council of Agricultural Research.

Sir J. C. Ghosh, Director of the Indian Institute of Science, in welcoming the biochemists to Bangalore, pointed out the important role played by the present scheme as a vital part of the Grow More Food campaign and hoped that the biochemists would take full advantage of the opportunities offered under the scheme and do their level best to make a success of the programme and thus alleviate the present serious position in the matter of food production in this country.

Dr. Gilbert Fowler who next addressed the biochemists pointed out the great interest he has taken in the subject for some decades past. Preparation of compost manure from waste materials, he said, is not such a simple matter as it

may appear to be on the surface. It involves the application of fundamental scientific knowledge, especially in relation to the transformation of carbon, nitrogen, phosphoric acid, potash and humus. This scientific knowledge should be adapted to local conditions and the process should be carried out in a manner to satisfy hygienic requirements (e. g. the absence of smell and fly-breeding) and at the same time on an economic basis so as to make the product as cheap as possible. He cited the example of the Chinese who did not fight shy of using human wastes on land.

Prof. V. Subrahmanyan, who followed next, said that till now several people had gone out from the Indian Institute of Science to occupy responsible positions in industrial and scientific institutions in the country; but this is the first time that people holding high positions outside have come to the Institute to be trained in improved scientific processes. He traced the history of the work carried out at the Institute on compost manufacture, starting from the pioneering work of Dr. Gilbert Fowler some 20 years back and culminating in the latest researches of Dr. Acharya. He mentioned that in recognition of the success of the work carried out by the Institute, the Government of India have now come forward with a large grant of Rs. 2½ lakhs to introduce the process developed at the Institute throughout India. He mentioned that when he was in England, in 1938-39, the view was expressed that India was leading the world in the matter of compost production; and added that the present scheme would take us several steps ahead of other countries in this direction.

Dr. C. N. Acharya, Chief Biochemist in charge of the Training Scheme, thanked Sir J. C. Ghosh, Dr. Fowler and Prof. Subrahmanyan for the welcome accorded to the Biochemists and pointed out that the new scheme would require for its success a great deal of organizing capacity in addition to scientific skill on the part of the Biochemists and would prove to be a highly responsible task for them.

Indian Institute of Science, }
Bangalore, August 7, 1943. }

(Sd.) C. N. Acharya

Crop and Trade Reports

Statistics—Crop—Sugarcane—1943—First forecast report The average area under sugarcane in the Madras Province during the five years ending 1941-42 represents 3.1 per cent of the total area under sugarcane in India. The area under sugarcane up to 25th July 1943 is estimated at 118,020 acres. When compared with the area of 97,860 acres estimated for the corresponding period of last year, it reveals an increase of 20.6 per cent. The estimated area is the same as that of last year in Nellore, Chingleput and Tinnevely. An increase in area is revealed in Vizagapatam, Kistna, Guntur, Bellary, Anantapur, South Arcot, the Central Districts, Tanjore, Madura, Ramnad and the West Coast owing to the favourable price of jaggery and a decrease in area in East Godavari, West Godavari, Kurnool and Cuddapah. The increase in area is marked in the Central districts (+12,760 acres), Bellary (+2,770 acres), Vizagapatam (+1,500 acres) and Madura (+1,030 acres).

The condition of the standing crop is reported to be generally satisfactory except in Chingleput where the crop is reported to have been affected to some extent by insect attack.

The wholesale price of jaggery per imperial maund of 82½ lb. (equivalent to 3200 tolas) as reported from important markets on 7th August 1943 was Rs. 15-13-0 in Erode, Rs. 14-2-0 in Salem, Rs. 13-15-0 in Mangalore, Rs. 12-13-0 in Cuddalore, Rs. 12-3-0 in Cocanada, Rs. 12/- in Chittoor, Rs. 11-15-0 in Bellary, Rs. 11-8-0 in Rajahmundry, Rs. 10-5-0 in Coimbatore and Vellore and Rs. 10-1-0 in Adoni. When compared with the prices published in the forecast report

issued at this time last year, these prices reveal a rise of approximately 79 per cent in Bellary, 27 per cent in Cocanada, 20 per cent in Erode, 19 per cent in Salem, 16 per cent in Rajahmundry, 15 per cent; in Mangalore, 12 per cent in Cuddalore and 6 per cent in Chittoor and a fall of approximately 9 per cent in Adoni, 7 per cent in Vellore and 4 per cent in Coimbatore.

Statistics—Crop—Gingelly—1943-44—First forecast report The average area under gingelly in the Madras Province during the five years ending 1941-42, represents 15.6 per cent of the total area under gingelly in India. The area under gingelly up to 25th July 1943 is estimated at 315,900 acres. When compared with the area of 299,600 acres estimated for the corresponding period of last year, it reveals an increase of 5.4 per cent. The increase in area occurs in the Circars, Kurnool, Bellary, Cuddapah, Nellore, Chingleput, Trichinopoly and Tinnevely and is attributed partly to timely sowing rains and partly to the high prices ruling for gingelly seed. The variations are marked in Vizagapatam (+16,000 acres), West Godavari (+14,000 acres), Chingleput (+6,500 acres), South Arcot (-4,200 acres) and Salem (-9,900 acres).

The condition of the crop is reported to be generally satisfactory except in the Divi taluk of the Kistna district where the crop is reported to have been submerged by heavy floods in the Kistna river, and in parts of the districts of Bellary, South Arcot and Coimbatore where the crop is reported to have suffered from drought to some extent. The yield is expected to be generally normal in the other districts.

The wholesale price of gingelly seed as reported from important markets on 7th August 1943 was Rs. 16-6-0 in Tuticorin, Rs. 15-13-0 in Trichinopoly, Rs. 15-7-0 in Cuddalore, Rs. 15-6-0 in Salem, Rs. 14-15-0 in Tinnevely, Rs. 13-14-0 in Ellore, Rs. 13-9-0 in Cocanada, Rs. 13-6-0 in Rajahmundry, Rs. 13-5-0 in Vizianagaram and Rs. 11-9-0 in Vizagapatam. When compared with the prices published in the report for the corresponding period of the previous year, i. e., those which prevailed on 10th August 1942, these prices reveal a rise of approximately 67 per cent in Tinnevely, 72 per cent in Vizianagaram, 60 per cent in Ellore and Salem, 58 per cent in Tuticorin, 52 per cent in Rajahmundry, 51 per cent in Cocanada, 50 per cent in Cuddalore and 44 per cent in Trichinopoly. (*Secretary, Board of Revenue—Civil Supplies, Madras*).

Cotton Raw, in the Madras Presidency The receipts of loose cotton at presses and spinning mills in the Madras Presidency from 1st February to 6th August 1943 amounted to 278,212 bales of 400 lb. lint as against an estimate of 406,300 bales of the total crop of 1942-43. The receipts in the corresponding period of the previous year were 465,400 bales. 398,233 bales mainly of pressed cotton were received at spinning mills and 839 bales were exported by sea while 157,668 bales were imported by sea mainly from Karachi and Bombay. (*From Director of Agriculture, Madras*).

Mofussil News and Notes

Agricultural exhibition at Thirukannapuram Under the auspices of the National War Front, an Agricultural Exhibition was conducted from 8th to 10th July, 1943 at Thirukannapuram, Nannilam Taluk, during the Kumbabishekam festival occurring once in 30 or 40 years. The exhibition was opened by Sri. M. Anandan, L. Ag., District Agricultural Officer, Tanjore. The Tahsildar, Sri. S. K. Vedamuthu, B. A., presided. Before opening the exhibition the District Agricultural Officer explained the difficulties in procuring food grains in other districts and exhorted the audience to produce more and give as much as they can for the starving millions in the dencit districts. The exhibits included paddy strains, groundnut strains, hand paddy husker, the specimens of green

manure crops of *kolinji*, *daincha*, sunnhemp, *pillipesara*, *Sesbania* etc., Fruit plants from the South Indian Lakshmi Nurseries, Kumbakonam, Coconut seedlings from Adirampatnam, Potato varieties from Nanjanad. Canned fruit products from Kodur, specimen of insect pests and diseases and posters depicting the various ways and means of increasing yields of crops. There were large crowds of visitors to the exhibition.

M. A.

Grow More Food Exhibition at Trichinopoly. An Agricultural "Grow More Food stall" was put up during the Fourth War Services Exhibition organized by the Department of Publicity and Broadcasting (New Delhi) at Puthur Maidan, Trichinopoly from 16th to 26th July 1943.

The object of this kind of Grow More Food stall, in the midst of war propaganda was to instill the idea into the minds of the visitors and to encourage them to grow more of food crops, vegetables and fruits. All kinds of vegetables both foreign and indigenous, all varieties of greens, numerous kinds of fruits of the plains and the hills, were kept on show. Prepared food stuffs which are deemed handy to the army like, puffed rice, beaten rice, fried bengal-gram, cholam, cumbu and ragi malts were exhibited. The preparation of malts from the above grains was demonstrated. Rotis both sweet and salted were prepared from the flour of these grains in an improved hearth which operated three pans at a time but consumed less fuel than a country one. The hand pounding of paddy in a wooden grinder was also demonstrated. The usual agricultural exhibits were also on show. Agricultural posters on grow more food etc. were hung prominently.

The Co-operative Department put up a creamery and a hand loom product stall. Advertisements on "Drink More Milk" were prominently put in view. Pure milk, khoa and ice cream were also distributed free to some distinguished visitors.

The Exhibition was opened by Sir P. T. Rajan, Ex-Development Minister, Madras and it attracted a large crowd of visitors every day. Among the distinguished visitors were Sir T. Boag, Adviser to the Government of Madras, S. K. Chettur Esq., Collector of Trichinopoly, C. Ramaswami Esq., Deputy Director of Agriculture, Coimbatore, the Rajah of Pudukottah and Khan Bahadur P. Kalifullah Sahib, Administrator, Pudukottah State. T. G. A.

College and Estate News

Students' Corner The inaugural address of the students' club was delivered on 9-8-'43 by Sri K. C. Ramakrishnan, M.A., Lecturer in Agricultural Economics with Sri S. N. Chandrasekhara Ayyar, M.A., Lecturer in Botany, in the chair. The meeting was well attended. The lecturer dealt on the place of Economics in Agriculture and exhorted the students to study that aspect as well as others.

Games Hockey The opening match of the season was played against the officers' X and it ended in a draw with one goal each side. Two more matches were played in one of which the officers were defeated but in another they won. In a match played against the Reserve police, our team won by one goal to nil.

Foot ball In the first match played against the Government Arts College, our team won by 2 goals to nil

Cricket The opening match of the season was played against the officers XI in which the students sustained bad defeat scoring only 35 runs against 135 runs by officers—Mr. K. B. Datta 52 runs including five fours and one six and Mr. K. M. Thomas 27 runs retired.

In another match played against Stanes European High School on 31st July 1943 on our grounds, the College scored 74 runs (Muthukumarappa and Raghavan 13 each) against 62 (A. S. Krishnan 6 for 26) scored by the visitors.

RETIREMENT

Sri K. RAGHAVACHARYA, L. Ag

Sri K. Raghavachari one of the foundation members of the Madras Agricultural Students' Union, retired from the post of District Agricultural Officer, South Arcot District on 15th July 1943. He took his diploma in agriculture in 1913, securing Kees prize for Agricultural chemistry. He joined the Agricultural Department in June 1913 and worked in the districts as manager of agricultural research stations like Palur, Hagari, Bantanalal, and Hosur. He won the Ramasastrulu Munagala, and Vengail Krishna Nainar prizes. He was the first *alumnus* of the College of Agriculture, Coimbatore to take up the teaching of Practical Agriculture in which he earned good name of being an impressive teacher with wide experience and depth of knowledge and was on that account chosen as lecturer more than once. He was a member of the Academic council of the Madras University. He was gazetted in 1922. As a District Agricultural Officer he served in the Ceded Districts and in all the Tamil districts except Ramnad and Tinnevely.

During the early days of the Madras Agricultural Students' Union he took active part in its management by working as its manager and later on as its secretary.

Being of an engaging disposition, alert and keen in observing agricultural practices and suggesting new ideas about their improvement, he retained the affection and respect of all his colleagues and students. We learn that he has settled in his village in Tanjore district and taken up farming. We are sure that he will prove there a good exponent of improved agricultural methods and a reliable guide to his brother agriculturists. We wish him success in his new sphere of life.

Departmental Notifications

Gazetted Service—Appointments—Postings and Transfers

Sri P. Venkataramayya, Agricultural Chemist and part time Principal, Agricultural College, Coimbatore is appointed to officiate as wholetime Principal, Agricultural College, Coimbatore.

Sri H. Shiva Rao, Assistant Agricultural Chemist, Coimbatore is appointed to act temporarily as Agricultural Chemist, Coimbatore *vice* Sri P. Venkataramayya.

Sri Rao Bahadur V. Ramanatha Ayyar, Cotton Specialist and Geneticist, Coimbatore, is appointed to officiate as Headquarters Deputy Director of Agriculture, Madras.

Sri R. Balasubramanya Ayyar, officiating Assistant Cotton Specialist, Cocanada Cotton Scheme, Narasaraopet, is appointed to act temporarily as Cotton Specialist, Coimbatore, *vice* Sri Rao Bahadur V. Ramanatha Ayyar.

Sri M. Suryanarayana, Assistant in Chemistry, Coimbatore, is appointed to officiate as Assistant Agricultural Chemist, Coimbatore *vice* Sri H. Shiva Rao.

Sri C. M. John, Oil Seeds Specialist, Coimbatore is appointed as Oil Seeds Specialist and Geneticist with effect from the date Sri Rao Bahadur V. Ramana Ayyar hands over charge of the post.

Sri K Govindan Nayar, Assistant in Chemistry, Coimbatore to officiate as Assistant Agricultural Chemist, Coimbatore during the absence of Sri M. Suryanarayana.

Sri C. Jaganatha Rao, Assistant in Cotton, Agricultural Research Station, Hagari is appointed to officiate as Assistant Cotton Specialist, Cocanada Cotton Scheme *vice* Sri R. Balasubrahmanya Ayyar.

Sri G. Ganapathi Ayyar, Assistant in Chemistry, Coimbatore is appointed to act temporarily as Assistant Agricultural Chemist from 26-7-43

Sri D. Viswanatha Reddy, Farm Manager, Central Farm, Coimbatore is appointed to act temporarily as Assistant Marketing officer, Madras.

Sri T. G. Muthuswami Ayyar on return from leave to be D. A. O. Tinnevely.

Sri K. Jagannatha Rao on return from leave to be D. A. O. Kurnool

Sri A. Gopalakrishnaiah Nayudu, on return from leave to be D. A. O. Nellore

Sri A. Chidambaram Pillai D. A. O. Cuddalore to be D. A. O. Guntur.

Janab A. Gulam Ahmed Sahib Bahadur on return from leave to be D. A. O. Cuddalore.

Leave

Sri T. S. Ramasubramania Ayyar, Assistant Agricultural Chemist (on leave) extension of l. a. p. for 7 days and half average pay for 4 months and 20 days from 13-4-43 preparatory to retirement.

Sri V. K. Subramania Mudaliar, D. A. O. Kurnool l. a. p. for 4 months from the date of relief.

Subordinate Services—Appointments

The following fieldmen are appointed to officiate as upper subordinates with effect from 10-8-43.

Sri P. Lakshmanababu, Fieldman, A. R. S. Samalkottah to be A. D. Kurnool Dt.

Sri P. R. Nagaraja Rao, Fieldman, Millets Section, Coimbatore to be Asst. in Entomology section, Coimbatore.

Sri K. Kanniah, Fieldman, A. R. S. Tindivanam to be F. M. Central Farm, Coimbatore

Sri K. V. Chelamiah Sastry, Fieldman, A. R. S. Siruguppa to be F. M. Siruguppa.

Sri T. V. Subramaniam, Fieldman, Central Farm, Coimbatore to be Asst. in Mycology section, Coimbatore.

Promotions

The following grade promotions of upper subordinate in the Agricultural Section are ordered with effect from the dates noted against each:-

Sri T. G. Anantha Rama Iyer, D. A. O. Trichinopoly II Grade (old) to I Grade (old) from 1-4-41.

Sri M. P. Gourisankara Ayyar, A. D. Devakottah, III Grade (old) to II Grade (old) from 3-9-41.

Sri T. G. Muthuswami Ayyar III Grade (old) to II Grade (old) from 3-9-41.

The following Lower subordinate promotions to upper subordinates in the Agricultural service in the new III Grade are ordered with effect from 1-4-43:-

Messrs. M. Gopala Rao, A. D. Vizianagaram, R. Narasimha Acharya, A. D. in Entomology, Saidapet, and C. L. Narasimha Rao A. D. Rapalli.

The following grade promotions of lower subordinates in the Agricultural subordinate service from V Grade to IV Grade take effect from 1-4-43.

Messrs. P. A. Kunhiraman Nambiar, A. D. Tiruchendur, Y. Venkateswara Rao Nayudu A. D. Gudipada, and K. Krishna Hegde, F. M. Sim's Park, Coonoor.

Postings and Transfers

Name of officers	From	To
Sri N. Venkayya	F. M. A. R. S. Siruguppa	Asst. in Millets. A. R. S. Guntur.
„ S. Suryanarayana	A. D. Vizagapatam	A. D. Vizagapatam for special duty for supply of Fresh Fruits and onions to troops
„ K. V. Chelapathi Rao	A. D. Tanuku	A. D. Chintapalli special duty for the cultivation of vegetables
„ K. Veerabhadra Rao	A. D. on special duty Chintapalli	A. D. Narasapatam
„ P. S. Krishnamurthi	Entomology Asst. (on leave)	Entomology cum Mycology Asst. Nellore
„ T. Lakshmiopathi Rao	A. D. Bheemavaram	A. D. Tadepalligudam
„ U. Ananda	F. M. A. R. S. Kasargode	F. M. A. R. S. Nileshtar
„ K. Sheenappa	F. M. A. R. S. Nileshtar	F. M. A. R. S. Kasargode
„ V. Satagopa Ayyangar	Offg. D. A. O. Tinnevely	A. D. Mayavaram
„ M. Vaidyanathan	A. D. Wheat Rust Scheme, Ootacamund	A. D. Coonoor.

Leave

Name of officers	Period of leave
Sri R. Govindaramayya, F. M. A. R. S. Pattukottai	Extension of l. a. p. for 2 months from 27-7-43.
„ T. V. Srinivasacharlu, A. D. Perambudur	Extension of l. a. p. on m. c. for 2 months from 20-7-43.
„ M. K. Swaminathan, A. D. Orathanad	Extension of l. a. p. on m. e. for 2 months from 16-7-43.
„ M. P. Sankaran Nambiar, A. D. Dharapuram	L. a. p. for 1 month from 26-7-43.
„ M. P. Gourisankara Iyer, A. D. Devakottai	Extension of l. a. p. on m. c. for 4 months from 5-8-43.
„ V. Atchutan, A. D. Tiruvur	L. a. p. for 1 month from the date of relief.
„ K. Brahmachari, Asst. in Entomology, Nellikuppam	L. a. p. for 1 month from 5-8-43.
„ S. Krishnamurthi, Asst. College Orchard, Coimbatore	Extension of l. a. p. for 1 month from 1-8-43.