

262

The Madras Agricultural
Journal

1937- July.

VOL. 25. NO. 7.



JL
Jm 211, N13
N 27. 25. 7
94631

52.852

Regd. No. 1155.

THE MADRAS AGRICULTURAL JOURNAL

Vol. XXV.

July, 1937.

No. 7.

262

CONTENTS

	Page.
Conference of Research Workers on Cotton in India ...	199
ORIGINAL ARTICLES	
1. Growth of Canes at the Palur Agricultural Research Station ...	204
<i>C. S. Krishnaswamy and V. K. Appaji.</i>	
2. Inheritance of Characters in Gram (<i>C. arietinum</i>) ...	207
<i>R. Balasubramania Ayyar.</i>	
The Agricultural College Day and Conference of 1937 ...	209
Agricultural Jottings ...	217
Extracts ...	219
Gleanings ...	219
College News and Notes ...	219
Weather Review ...	221
Departmental Notifications ...	222

Published by

THE MADRAS AGRICULTURAL STUDENTS' UNION,
Agricultural College and Research Institute,
Coimbatore, S. India.

Annual Subscription Inland Rs. 4-0.
" " Foreign Rs. 4-8.

Single Copy
As. 6.

The Madras Agricultural Journal

THE PREMIER AGRICULTURAL MONTHLY IN INDIA

A Monthly Journal in English devoted to the study and development of Agricultural Science. Contains articles of scientific as well as of general interest written in popular language. Reviews of agricultural publications and extracts from various Journals—both Indian and Foreign—a special feature. Commands a wide circulation and is an excellent medium therefore, for advertisements.

Rate of Subscription.

Journal supplied free to Members, Associates and Patrons of the Union

Annual Subscription rates for others:

	Rs.	A.	P.
India and Ceylon.	4	0	0
Foreign	4	8	0
Single number	0	6	0

Rates of Advertisement.

For Single insertion

	Rs.	A.	P.	
For full Page	6	0	0	Liberal discounts are allowed
For half Page	3	8	0	for standing matter provided
For quarter page	2	0	0	space is booked ahead and
				pre-payment made.

Inside cover pages 25 per cent. extra.

Outside cover pages 50 per cent. extra

Preparation of blocks, unless supplied by advertisers, charged extra.

N. B. All advertisements are subject to the approval of the M. A. S. U. Managing Committee before insertion. The charges are strictly payable in advance.

Contributions to Journal.

Contributions on subjects of Agricultural interest or pertaining to rural economy and co-operation will be accepted for publication, subject to approval of the Editorial Board. Correspondence and queries on agricultural and allied subjects are invited. Manuscripts should be sent clearly written or typed on one side of the paper only.

Twenty-five copies of reprints of contributions will be presented to authors. Extra copies and printed covers for reprints, if required, can be supplied at actual cost if intimation is given when the manuscript is presented.

N. B. The Editorial Board does not hold itself responsible for the opinion expressed by the contributors.

All communications should be addressed to:

THE SECRETARY, M. A. S. UNION,
AGRICULTURAL COLLEGE,
Coimbatore, Lawley Road P. O.

STANES FERTILISERS

FOR ALL CROPS

PRICES MODERATE QUALITY EXCELLENT

Fifty Years' Experience in Manures

ALL ORDERS PROMPTLY EXECUTED

Special Manure Mixtures for:—

PADDY	POTATOES	SUGARCANE
TOBACCO	CHILLIES	COTTON
BETEL VINE	PLANTAINS	COCONUT
ETC.	ETC.	ETC.

For further particulars please apply to:—

T. STANES & Co., LTD.,
RYOTS SALES DEPARTMENT,
COIMBATORE

When answering our advertisers, please mention 'The Madras Agricultural Journal'

THE PRESIDENCY MANURE WORKS, LTD.,

RANIPET & FEROKE

Managing Agents :—

Messrs. PARRY & Co., Ltd, Madras.

**FOR EVERY FIELD AND GARDEN CROP
PARRY'S HAVE A COMPLETE FERTILISER**

composed of high-grade materials and containing all the plant foods in the right proportions suited to the crop and to the soil and based on their experience of over 30 years in the various districts of the Presidency.

PARRY'S COMPLETE FERTILISERS

not only give an increased yield from the crop for which they were used but also leave a residual effect on the next crop as they are composed of organic and inorganic fertiliser materials.

Complete Fertilisers suited to the particular district are stocked at the offices or depots of Messrs. Parry & Co., Ltd., in the various districts or by their distributors.

For details of application, prices and other information about manuring, please apply to the nearest office or depot of Messrs. Parry & Co., Ltd., or to their distributor in your district or apply direct to

Messrs. PARRY & Co., Ltd.,

RYOT SALES DEPOT.,

POST BOX 12,

MADRAS

When answering our advertisers, please mention 'The Madras Agricultural Journal'



Willingdon Soap :— Queen of Toilet soaps as supplied to Their Excellencies the Earl & Countess of Willingdon and graciously permitted to bear their name.

Sandalwood Soap :— Ideal for summer use.

Kerala Soap Institute, Calicut.

BY APPOINTMENT

TO HIS EXCELLENCY THE EARL OF WILLINGDON
VICEROY AND GOVERNOR GENERAL OF INDIA

FOR SALE

Unique mango grafts bearing fruits of extraordinary size of 300 tolas like **Tenneru, Tunikalu, Elephants thread**; with length 15" as **Council pasand, Pice pasand, Jerry potulu**; with excellent Colour like **Elivai large, Janardhana Prasad**; Emperor of mangoes in taste as **Jehangir and Himampasand, Sapotas, Guava, Pomaloes, Batavian, Oranges, Coconuts** and other fruit trees 500 varieties of excellent roses and other flower plants.

THE ANDHRA NURSERY,
GOLD MEDALISTS

Kadium P. O. East Godavary Dt.

PRACTICAL HINTS ON BEE KEEPING
By M. C. Cherian & S. Ramachandran.

REPRINTED FROM

The Madras Agricultural Journal Vol. XXV, No 5.
Price Annas Two only.

Apply with 3 as. stamps to :—

**The Secretary,
M. A. S. UNION,
LAWLEY ROAD P. O.**

When answering our advertisers, please mention 'The Madras Agricultural Journal'

The Indian Veterinary Journal.

(The Official Organ of the All-India Veterinary Association).

The Journal is the only English Veterinary Journal of its kind in India devoted to the cause of Veterinary Practice, containing standard articles on all branches of clinical Veterinary medicine, surgery and kindred subjects. It also contains a review of current Veterinary Literature, and is valuable alike to Veterinarians and Agriculturists.

AN EXCELLENT MEDIUM FOR ADVERTISEMENT

To members of the profession & students Rs. 4 per year.

To non-members & others Rs. 8 per year.

For rates of advertisement and other particulars apply to :

THE EDITOR,

36, Wallaja Road, Mount Road, P. O., MADRAS

Kerala Soap Institute, Calicut.

UNDERTAKES THE ANALYSIS OF OIL SEEDS

OILS, SOAPS AND SUCH PRODUCTS

FEES MODERATE

ENQUIRIES SOLICITED

'THE MADRAS CO-OPERATOR'

ISSUED EVERY MONTH IN TWO LANGUAGES

—:O:—

The only Journal pleading for the development of
various types of co-operative institutions

among Urban Population.

—:O:—

Annual Subscription Rs. 2.

Please apply to:—

THE EDITOR,

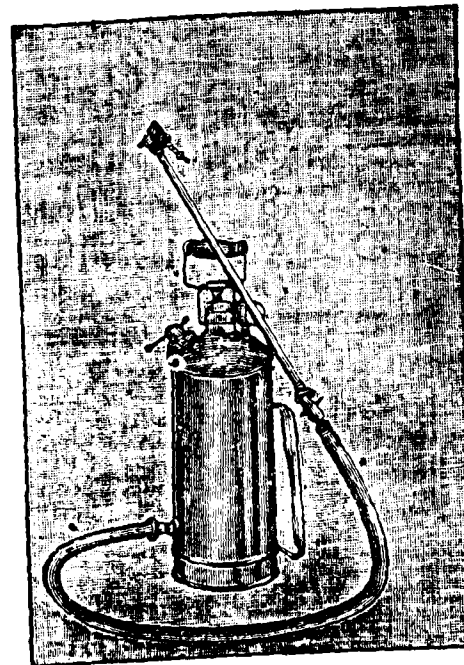
Office of The Madras Co-operator,

20, Second Line Beach,

G. T. MADRAS

When answering our advertisers, please mention 'The Madras Agricultural Journal'

Copper or Brass Tank Knapsack Sprayers.



Better than any imported. For Preventing agricultural pests and diseases. Very useful for Agriculturists, Arecanut Garden owners, Tea, Rubber & Coffee Estates. More than 1000 of our sprayers are already in use in the different parts of India. We keep spare parts of our sprayer. Excepting Pressure Gauge, all parts are made in our factory. We undertake repairs to Sprayers.

Trial order solicited.

Telegraphic address: "FURNITURE" Calicut.

THE STANDARD FURNITURE CO., LIMITED.
KALLAI, MALABAR



POCHA'S SEEDS

ASK FOR A FREE CATALOGUE:
VEGETABLE & FLOWER SEEDS, PLANTS, BULBS, ETC.

PESTONJI POCHA & SONS, POONA.

When answering our advertisers, please mention 'The Madras Agricultural Journal'

THE VILLAGERS' CALENDAR

Published Annually
BY
THE MADRAS
AGRICULTURAL DEPARTMENT
IN

English, Tamil, Telugu, Malayalam & Kanarese.
(Jan.) (April) (March) (Sept.) (March)

It contains instructive and interesting articles on Agriculture and Veterinary Science and exhaustively deals with the work of the department including agricultural research stations, Pumping and boring operations, state loans, etc.

Price 1 anna, Postage 2 annas.

Apply to the Deputy Director of Agriculture or the District Agricultural Officer or the Agricultural Demonstrator nearest to you with three annas stamps. Not sent by V. P. P.

THE JOURNAL OF THE Mysore Agricultural and Experimental Union, BANGALORE

Published Quarterly by an Expert Board of Editors.

Chief Editor : Dr. B. Narasimha Iyengar, B. A., Ph. D.

SUBSCRIPTION RS. 3 PER ANNUM

The Madras Journal of Co-operation

The Premier Monthly Co-operative Journal in India.
Voices forth the Co-operative Opinion of the Province.

ANNUAL SUBSCRIPTION

Inland (including Postage)	...	Rs. 4	0
Foreign	" "	...	" 4 12

Please apply to: The Madras Provincial Co-operative Union,
Royapetta, MADRAS

When answering our advertisers, please mention 'The Madras Agricultural Journal'

Copy of letter dated 19th June 1937 from the President,
The Karachi Pinjrapole Association, Karachi,
to the Principal, Agricultural College,
Coimbatore.

With a view to reduce unemployment and also afford practical training to Agricultural Graduates, preferably those who have passed with Animal Husbandry as one of the subjects, we have devised a scheme under which we propose to take about half a dozen Graduates in Agriculture for practical training on our stud farms and in our Model Dairy. Each graduate will be placed in charge of one of our out-stations about 10 miles from the City and given a salary at the rate of Rs. 40 per month together with free lodging while under training.

We shall be glad if you can direct any of your students wishing to take advantage of this scheme to communicate with us.

Madras Agricultural Journal

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

Vol. XXV]

JULY 1937

[No. 7.

CONFERENCE OF RESEARCH WORKERS ON COTTON IN INDIA

Cotton workers in India should be grateful to the Indian Central Cotton Committee for arranging a conference—the first of its kind in India—of all those engaged in problems connected with this crop. The conference came off on the 4th to 6th of March last and was presided over by Sir Bryce Burt, C.I.E., on the first day and by Dr. Burns on the two succeeding days. A fairly large number of workers from various cotton growing provinces as well as many professors from several scientific institutions at Bombay were present. Twenty-six papers dealing on different aspects of cotton growing and technology and three important subjects relating to the procedure to be adopted in future were placed before them for exchange of views and recording their considered opinion.

In opening the conference Sir Bryce Burt rightly stressed on the importance of such scientific gatherings which, to quote his own words “do much to defeat distance and to mitigate that intellectual isolation which fortunately is so often the lot of the scientific worker in India” and “broaden the outlook of every cotton research worker by bringing him in touch with those working in the other branches of science”.

The conference is reported to have been a great success which was no doubt due to the great care and untiring efforts of the Secretary, Indian Central Cotton Committee in arranging the details and the very able guidance of its presidents. It is hoped that the discussions at the conference would have the desired beneficial effect.

A noteworthy feature of the conference which had been responsible for the high level of the discussion was the circulation, beforehand among those who were expected to attend the conference, of full copies of all the papers presented.

In briefly summarising the papers and discussions of the conference, we are sure we will be supplying our readers with a topic of great interest and considerable importance.

Plant Breeding :—Mr. J. B. Hutchinson read a paper on “The distribution of *Gossypium* and the evolution of commercial cottons”. After considering the distribution and relationship of cotton species, he came to the conclusion that from perennial, highly monopodial, and bushy forms, early annual, and sympodial

types have been developed in recent times in response to the selective influences of short growing seasons and cold winters. He added that two lines of development in the case of Americans could be postulated. In the moist tropical regions the perennial types continued to thrive, but on the plateau the annual forms had the advantage and the modern demand for high cropping power accelerated their spread. He said that the same agency was at work even in the case of Asiatic cottons. Annual types arose in *arboreums* at four centers differing in environment. He opined that the South Indian *arboreums* were different from those developed in Northern India. The former was characterised by having low ginning percentage and fine fibres, whereas the latter had coarse fibres in abundance. The North Indian *arboreums* spread rapidly when great importance came to be attached to high ginning percentage. He further said that *G. herbaceum* was most probably a native of Africa and was introduced into India in fairly recent times. He concluded by saying that the line of meeting of 13 chromosome cottons of Asia with similar ones of America to form the 26 chromosome allo-polyploid groups should have been across the Pacific and not across the Atlantic ocean as formulated by Davy.

Mr. P. Abraham and V. Ramanatha Ayyar in a paper on "Floral Anatomy as an aid to classification of cottons" reported about the possibility of utilizing the vascular anatomy of the flower in the classification of cotton species. The wild types were found to differ from the cultivated in having a fewer number of vascular strands. As per this criteria, *G. religiosum* had to be deemed nearer to wild types than *G. hirsutum* and *G. barbadense*. The Old World cultivated forms would appear to fall under two distinct groups viz., the *herbaceum* and the *arboreum*. It was further found possible to divide each one of these two groups, into two distinct sub-groups. From the mode of grouping of the bundles it seemed probable that the *herbaceum* was the Asiatic parent for the New World 26-chromosome group of cottons. Anatomically the *arboreums* would appear to be nearer than the *herbaceums* to the Asiatic wild cottons.

Messrs J. B. Hutchinson, P. D. Gadkari and M. A. A. Ansari, contributed a paper on "The genetics of *Gossypium* and its application to cotton breeding". After surveying the contributions of theoretical genetics to the equipment of the cotton breeder, the authors drew the attention of workers to the need for conserving the genetic variance of the material until the mean value has been raised to the required degree. The usefulness of crop-surveys in ascertaining the survival values of crop constituents was pointed out by reference to the powerful effect of natural selection in maintaining the crop composition against the pressure of the introduction of *roseum* seed by human agencies in Malwa.

Mr. V. Ramanatha Ayyar while discussing "some aspects of cotton Breeding work in India" stated from his experience in Madras, that attempts at increasing the length of the staple of Asiatic cottons, generally resulted in a general decrease in the yield. In American cottons there was always a good combination of yield and quality, and he therefore suggested the introduction of fresh material directly from Central America, the natural home of American cottons. He attributed the failure of American cottons in India to the fact that only types which had been acclimatized in the United States of America, Egypt or South America were imported. He referred to the fact that countries like China, Russia and also Africa which were once growing Asiatic cottons are now replacing these with American cottons.

Mr. K. I. Thadani presented in his paper the history of cotton-breeding work, and the introduction of improved strains in Sind. Mr. D. N. Mahta gave an account of cotton-breeding work in Central Provinces and Berar. Mr. K. Sawhney referred to the problems connected with the production and introduction of improved strains to replace the existing mixtures in the Hyderabad state.

Mr. V. Ramanatha Ayyar while describing the effect of X-rays on *upham* and *karunganni* cottons mentioned the stimulating effect of treated pollen on succeeding generations and the occurrence of uneconomical and recessive mutants in the second generation of treated seed.

Agronomy: Mr. B. M. Dabral contributed "A note on factors in the acclimatisation of exotic varieties of cotton in Sind". Local or *Deshi* cottons gave the highest percentage of germination, and were least affected by white ant and by the fungus causing "damping-off." In April sowings, *deshi* plants suffered least from high temperature and strong winds. The long stapled *hirsutums* were subject to jassid attack and the Cambodia and Egyptian cottons preferred a lower range of temperature for their fruiting than the Americans or *Deshi*. The Sea Island cotton was reported to possess a staple of 1½ to 2 inches in its original home never produced in India a staple longer than 1¼ to 1½".

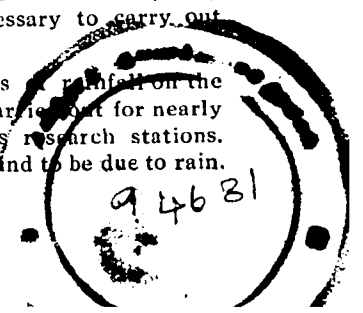
Mr. M. A. Shama Iyengar in a paper on "The saline soils of Sind and the cotton plant" referred to the tolerance of cotton to salinity. He suggested the possibility of utilizing cotton for removing sodium salts since cotton removed as much as 126 lb. of sodium chloride per acre and since cotton could be grown without rotation for a period of at least six years. He further pointed out the need for growing cotton instead of keeping the land fallow after the soil had been leached with water. In his opinion the *Deshi* selection 27 W. N. and the American selection 285—F₂ show comparatively greater tolerance to salt.

Mr. M. K. Barakzai in his paper on "cotton agronomy in Sind" referred to the introduction of drill sowing to facilitate interculture with bullock power, and to the need for irrigations at longer intervals during the earlier growth period and frequent waterings at shorter intervals during the reproductive phase of the plant.

Mr. M. Mohammad Afzal read a paper on "Watering experiments on cotton" in the Punjab. The ridge versus flat sowing gave indifferent results and the extra cost of ridging and hand sowing did not appear to be justified. Irrigations at intervals of every three weeks benefited the crop more than irrigations at longer intervals. In the years of average rainfall, first two irrigations should be given at an interval of three weeks and subsequent irrigations after every fortnight. The local practice of delaying the first irrigation for five or six weeks after sowing was definitely detrimental, it being essential to irrigate three weeks after sowing. On an average 24 to 28 acre inches of water were required for a good crop of 4 F in the Punjab. On the whole, frequent irrigations were found conducive to the production of long and mature fibres but it did not lead to neppiness or to an increase in the highest standard warp count.

Cotton Technology. Dr. Nazir Ahmad and V. Venkataraman read a paper describing the influence of twist on yarn strength. They said that the spinners would desire to keep the twist as low as possible because increase in the twist would reduce the output of yarn. Certain amount of twist was however necessary to furnish strength to the yarn. By altering both the count and the twist, evenness, breakage andlea strength of yarn from certain short medium and long stapled varieties were determined. It was found that even though it was possible to spin experimentally certain cottons upto very high counts, in the industry they were seldom spun upto that high limit. It is therefore necessary to carry out tests on new varieties under certain rigid conditions.

Mr. R. S. Koshal and Nazir Ahmed in a paper on "Effects of rainfall on the quality of Indian cottons" presented the results of tests carried out for nearly ten years on standard Indian cottons grown on the various research stations. About onethird to half of the total annual variations was found to be due to rain.



Rain during the picking period proved harmful. Additional rain above the normal was beneficial if received during the maturation period, and with it were generally associated high temperature and humidity which probably benefited the proper thickening of the fibres. While interpreting the effect of rainfall on spinning value it was observed that, the change in the spinning value occurred with the change in the fibre length as well as fibre weight.

Mr. A. N. Gulati reported, that micro-organisms aided by high temperature and humidity which prevail in Bombay, caused the deterioration of Broach Palij cotton during storage. The stained and matted parts of the lint were found to be heavily infected with micro-organisms. The middle of the bale appeared to be a more favoured site for infection than the top and that some of the fungi obtained were well known cellulose decomposers.

Pests. Khan Bahadur M. Afzal Husain while presenting a paper on "The cotton jassid" stated that number of eggs laid on some varieties of cotton were definitely less, indicating that although the nymphs might breed on various types of cotton, certain types might lack in certain nutritional substance with the result that the adults hatched out of such eggs would not be able to lay eggs. This indicated that hairiness and some other factor in the plant went together to produce a jassid resistant type.

Mr. B. P. Deshpande gave "A brief account of the investigations on spotted boll-worms in South Gujarat". He explained that the pest is a serious one and is carried over by stray living cotton plants; and it is effectively controlled by pulling out these stray plants.

Speaking on the question of "The control of pink boll-worm" Mr. P. B. Richards stated that carry-over in the United Provinces was almost entirely in the seed, and that treating the seed with heat killed the insect. Mr. Nangapal found that the pest was carried over in Marhatwada, Hyderabad State through soil where the larvae went for pupation. Mr. Richards suggested that perhaps the soil temperature in Hyderabad was not high enough to kill the pupae but in the United Provinces during summer, lethal temperatures were reached in the soil.

Wilt resistance. Dr. B. N. Uppal speaking on "Breeding for wilt resistance in cotton" pointed out the necessity for conducting rigorous tests for resistance in the greenhouse, since under field conditions, plants which escape disease may be mistaken for the resistant plants. The fungus which under ordinary conditions lay quiescent in the field emerged when environmental (chiefly soil temperature) conditions became favourable. The degree of soil infestation by the parasite also varied. It was therefore important to have a standard technique under which selection for wilt resistance should be done, so that the results could be compared at all times. He therefore suggested that after the plant breeder was satisfied with the performance of the strain, it should be passed on to the pathologist for tests in a series of soil temperatures and in glass houses under optimum conditions. If further selection was necessary, the pathologist would carry them out.

Mr. Hutchinson speaking on the subject, referred to the inter-dependence of wilt resistance and other commercial characters which facilitated the breeding of resistance and commercial characters in one and the same strain. He further suggested that provided the resistance was sufficient for commercial purposes (95 per cent.) and the strain proved homozygous for wilt-resistance, it was not necessary to aim at 100 per cent. resistance, because it was extremely difficult to successfully introduce all factors into one type by hybridization.

The conference after considerable discussion agreed that the breeding of strains immune to wilt under optimum conditions should be the ideal to aim at.

but for agricultural distribution, 95 per cent. resistance under heavily infected field conditions might be deemed satisfactory provided the strain had been shown to be practically homozygous for that degree of resistance to wilt. It was decided that the conditions under which field tests are carried out should be described and standardized as far as practicable; and the pathologist should also conduct tests for homozygosity and select from the material should it be heterozygous.

Statistics. Mr. V. Panse drew the attention of the conference to the necessity for conducting varietal trials in representative localities before undertaking the distribution of a new strain and suggested a scheme for conducting such trials.

Rao Bahadur Mr. Vaidyanathan invited the attention of workers to the need for evolving a suitable sampling technique for different types of observations on cotton, and outlined the general principles of sampling methods which should be kept in mind.

Mr. Ramanatha Ayyar initiated a discussion on the supply of standard Indian cottons for test to the Technological laboratory. The conference decided that plant breeders should observe the conditions specified by the Director, Technological Laboratory and supply the samples accordingly. The crop should be grown on normal fields and the best seed should be used. The samples must be taken from the various pickings individually as well as collectively from all the pickings.

J. S. P.

The attention of our readers is invited to the two advertisements published in this issue, calling forth applications from agricultural graduates.

GROWTH OF CANES AT THE PALUR AGRICULTURAL RESEARCH STATION

By C. S. KRISHNASWAMI & V. K. APPAJI,
Farm Managers, Agrl. Research Station, Palur.

Nine varieties of cane were raised at the above experimental station during 1936-37 for the testing of yields. Opportunity was taken to measure their relative growth rates during the different months.

These canes were planted in March in randomised blocks repeated six times on a total area of 1.5 acres. Their relative heights in the last week of every month were measured on twelve canes selected from each plot. The basal points were marked permanently by driving nails in bamboo stakes planted on a level with the buds of the setts. The measurements were taken in inches from these nails to the topmost collar.

The progressive growth of the varieties and their relative rates during every month are furnished in Table I. The weekly rainfall and the average maximum and minimum temperatures together with the humidities recorded during the week are given in Table II.

It will be seen from Table I that all the varieties put forth their first node by the end of April and were thirteen to twentyfour inches in height by the end of May. Varieties Co. 419 and Co. 421 were the tallest, while 247 B and P. O. J. 2878 were the shortest. In the next month P. O. J. 2878 manifested a better growth than 247 B. The rest were nearly equal. During July, August and September the growth rates continued to be alike in all of them, but in October a setback was noticed, varieties Co. 281 and Co. 407 being the least, and Co. 421 and 430 the most, affected. In the next month a similar slower rate was recorded by all except in the case of Co. 281 which showed a sudden fall. In December all varieties barring 247 B had a further retarded growth; the latter however failed to grow thence forward. By February the rest of the varieties practically ceased to add further to their heights. When their final heights were compared, varieties Co. 407, Co. 419, P. O. J. 2878 and Co. 421 were the tallest, while 247 B was definitely the shortest.

When the periodical growth rates were correlated with the meteorological conditions prevailing during the several months, it was seen that the general growth was similar in all the varieties and that the growth rate was at its height during the Southwest moonsoon period when the temperature was relatively high and when the rainfall was better distributed though lower in quantity. During October and November, the heavy rains of Northeast monsoon occurred and there

was also a fall in temperature which seemed to affect the growth rate adversely. January and February had the least rainfall. The temperatures were the lowest and the mornings were dewy. During this period the canes hardly put forth any growth.

These observations may be summarised as follows:—

1. It may be stated in general that when sugarcane was planted in March at Palur, all the nine varieties grown for yield tests produced their first node in April. They were nearly eighteen inches in height by the end of May.

2. The growth was uniform and at its highest during June to September when the temperature was high and the rainfall was well distributed.

3. In the early months of the Northeast moonsoon, the cane varieties exhibited retardation in growth. During the cold months of January and February they hardly made any growth.

The writers take this opportunity to record their thanks to Nawabzada Sadat-Ullah Khan Esq., Deputy Director of Agriculture, IV Circle for the encouragement and facilities afforded to conduct the measurements.

Table I

Statement showing the height measurements of cane varieties in the comparative trial plots during 1936-37.

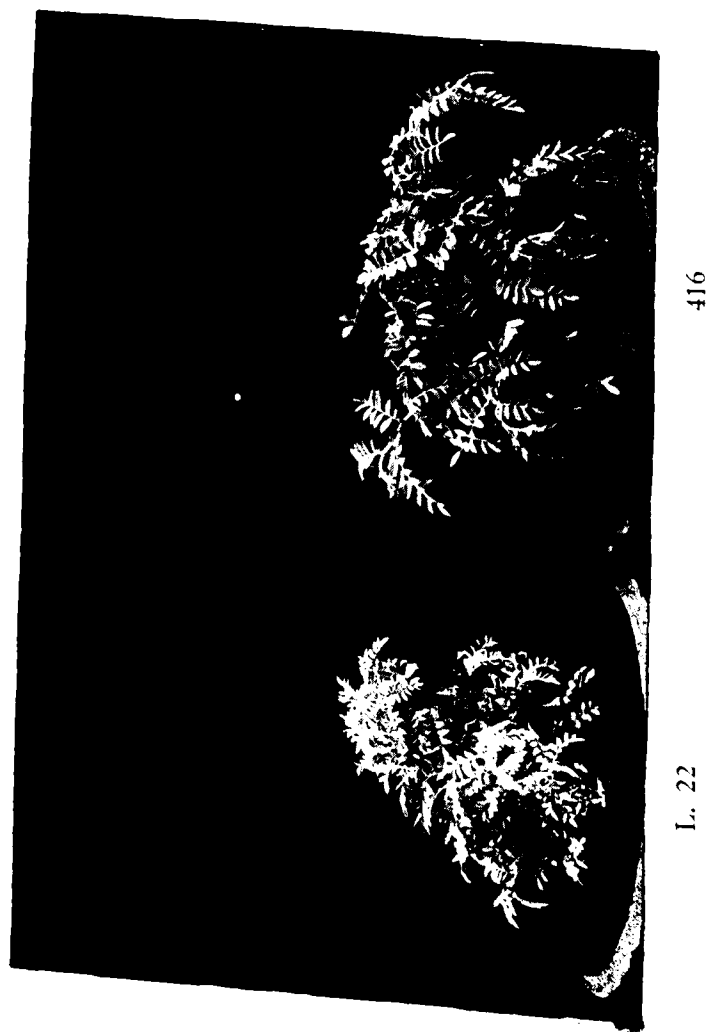
Serial No.	Name of the varieties	Progressive growth in inches during the month of										Actual growth in inches during the month of									
		May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.
1	247 B	13	25	47	68	88	99	114	126	127	128	13	12	22	21	20	11	15	12	1	1
2	Co. 281	20	40	60	80	101	117	126	131	135	135	20	20	20	20	21	16	9	5	4	-
3	Co. 407	19	39	65	90	109	125	135	145	148	150	19	20	26	25	19	16	10	10	3	2
4	Co. 408	20	39	65	84	107	119	132	138	142	144	20	19	26	19	23	12	13	6	4	2
5	Co. 413	20	39	62	83	101	113	129	135	137	138	20	19	23	21	18	12	16	6	2	1
6	Co. 419	24	49	61	81	101	116	129	139	147	148	24	16	21	20	20	15	13	10	8	1
7	Co. 421	24	42	67	92	114	124	135	143	146	147	24	18	25	25	22	10	11	8	3	1
8	Co. 430	20	41	65	87	108	118	132	141	144	145	20	21	24	22	21	10	14	9	2	1
9	P. O. J. 2878	15	34	57	83	104	117	133	141	145	148	15	19	23	26	21	13	16	8	5	2
Average		20	38	61	83	104	117	130	138	141	142	20	18	23	22	20	13	13	8	3	1

Table II.

Season.	Month.	Week.	Rainfall 1936-37.	Average maximum Temperature.	Average minimum Temperature.	Average Relative Humidity.
	March	36	1-7	99.1	72	86.4
			8-14	99.7	74	82.6
			15-21	100.7	75	83.4
			22-28	101.3	77	82.1
		Total	0.39	Av. 100.2	Av. 74.5	Av. 83.6

Table II (Contd.).

[illegible]



INHERITANCE OF CHARACTERS IN GRAM (*C. arietinum*)

Foliage colour and rough seed coat.

By R. BALASUBRAMANIA AYYAR,
Cotton Breeding Station, Coimbatore.

Foliage colour. Among the various exotic and extra provincial types of gram introduced and studied on the Cotton Breeding Station, Coimbatore, three types viz., L22 from Sirsa in the Punjab, T16 and T62 from Pusa in Bihar possessed pale yellowish chlorotic leaves. It was found to be a definite varietal character breeding true in L22, but in the other types observations were made only for one season and as such need further confirmation. It might however be stated that colour difference noticed in L22 is different from those described by Shaw and Khan (1931). These authors have recorded that the colour ranges from light yellowish green to dark bluish green. But in L22, the leaves assume a distinctly greenish yellow colour especially after a month after germination, which hue remains so, till harvest.

In order to find whether the character is Mendelian, this strain was crossed with a strain (No. 416) having normal green foliage. Their F_1 was dark green like the green parent 416 showing thereby its dominant feature. F_2 segregated into the two parental classes (Plate I) giving the following numbers.

Normal green.	Pale yellowish green.	Total	P value for 3:1 ratio
71	20	91	>0.5

The fit is good for a single pair of factors which may be designated by $Lg\ 1g$.

The two parents differed also in seed colour. Opportunity was taken to study if their progenies showed any linkage between seedcoat colour and foliage colour in F_2 . Unfortunately by the time they produced seeds, six plants from the green leaved type and twelve from the pale yellowish type died without giving any seed. This differential sterility resulted in the distortion of the normal dihybrid ratio (vide Table I)

Table I.

Actual number of plants in seed grade.			
C. S. 12.		C. S. 10.	
Green	Pale yellowish green.	Green	Pale yellowish green.
51	7	14	1

Within each of the foliage colour groups however, the fit was good for monohybrid ratio, indicating that the two genes T^1t^1 and $Lg\ 1g$ are independent.

Roughness of seed coat. The seed coat in gram may be either wrinkled, smooth to slightly granulated, or rough having a feel like sand paper. The inheritance of wrinkling in relation to smoothness has been worked out by V. Ramanatha Ayyar and R. Balasubramania Ayyar [1936], but the genetic behaviour of the rough surface has not yet been studied.

With a view to get information on the above point the rough seeded T 69 was crossed with two smooth surfaced types T 11 and T 43. The F_1 s had a rough seed surface and the F_2 showed a simple monohybrid segregation (vide Table II).

Table II.

Cross.	Actual number of plants with seeds.		Total.	P value for a 3:1 ratio.
	Rough.	Smooth.		
T11 $\times$ T 69	22	10	32	>0.31
T43 $\times$ T 69	236	85	321	>0.59

The pair of factors responsible for this phenomenon may be represented by the symbols R r.

The two smooth surfaced parents T11 and T43 differed also from the other, in factors P and T^2 respectively. When their segregation was studied with reference to seed roughness it was found that these two factors T^2 and P segregated independently of factor R (vide Table III).

Table III.

Cross	Actual number of plants in seed grade.						Total	Value of P
	C. S. 10		C. S. 8		C. S. 7			
	Rough	Smooth	Rough	Smooth	Rough	Smooth		
T11 $\times$ T69F ₂	18	8	...	...	...	...	32	0.80
T43 $\times$ T69F ₂	186	56	50	29	4	2	321	0.10

Acknowledgement. —

Acknowledgement. The author's thanks are due to the Indian Central Cotton Committee for permitting these studies during the off-season.

Summary. 1. Green and pale yellowish green colours of leaves in Bengal gram differ genetically from one another by a single pair of factors which are termed Lg lg. The factor Lg is found to be independent of factor T^1 .

2. Roughness and smoothness of seed coat are governed by a single pair of factors designated by letters Rr. They are independent of factors T^2 and P.

References.

1. V. Ramanatha Ayyar and R. Balasubramania Ayyar (1936) Proc. Indian Acad. Science, Bangalore Vol. 4 Section B, pp. 1-26.
2. Shaw F. J. F. and A. R. Khan (1931) Mem. Dep. Agriculture in India, Bot. Series Vol. 19.

THE AGRICULTURAL COLLEGE DAY AND CONFERENCE OF 1937.

The twenty-sixth College Day and Conference annually organised by the Madras Agricultural Students' Union was held at the Research Institute, Coimbatore on the 22nd and 23rd of this month under the presidency of Diwan Bahadur S. E. Ranganathan Avl., Vice Chancellor of the Madras University. The conference was attended by the Directors of Public instruction, and of Agriculture, Madras, several Deputy and Assistant Directors of Agriculture, District Educational Officer, Coimbatore and by a few members of the Legislative Assembly. Mr. R. C. Broadfoot, the Principal of the Agricultural College and the *ex officio* President of the Union, welcomed the guests in a neat little speech. After the reading of the messages from a number of members and well wishers of the Union, the secretary presented the report of the managing committee for the year 1936-37. The president after presenting medals and prizes to the winners, delivered an interesting speech in the course of which he dwelt on a few important aspects of 'Rural reconstruction' which formed the subject of the symposium arranged for discussion at the Conference. Twelve papers were presented by actual workers in the field as well as by persons who had bestowed some thoughts on this important topic of the day. An interesting and instructive discussion followed in which many took part. The Conference came to a close at 12-30 P. M. on the 23rd with a vote of thanks proposed by the Director of Agriculture, Madras and the Vice President of the Union.

On the night of the 22nd, the students of the College entertained the visitors by staging four dramas in English, Telugu, Malayalam and Tamil. On the 24th, the College day sports were held and the Union was 'at home' to the members and visitors. Mrs. A. C. Woodhouse kindly gave away the prizes to the winners in the sports. On the morning of the 25th the annual general body meeting of the Union was held with Mr. R. C. Broadfoot in the chair, when two important resolutions relating to the promotion of the interests of the unemployed members of the Union were passed. The accounts of the year and the budget for the next year were also passed. The office bearers for the next year were elected.

A conference of the departmental officers was also held on two days. The heads of sections in the Research Institute and the Principal of the College had kindly arranged for the benefit of the visitors as in last year, a comprehensive exhibition of the important lines of work pursued by them.

The Principal's Welcome Address.

Mr. R. C. BROADFOOT, *Principal*.

This is the sixth occasion on which it has been my privilege as President of the Madras Agricultural Students' Union to extend the Union's welcome to those attending its annual conference. Frequency does not however impair the sincerity of our welcome and I hope your visit will be pleasant and profitable and that you will carry away pleasant memories of our hospitality and friendship on this occasion.

2. It is a particularly pleasing privilege to introduce Diwan Bahadur S. E. Ranganathan, Vice Chancellor of the Madras University with which this College is affiliated and to thank him for accepting the Director of Agriculture's invitation on our behalf to preside over this year's College Day and Conference. Our association with the Madras University, now sixteen years old, grows with the years and will, I feel sure, continue to do so in the future. It is therefore particularly appropriate that Mr. Ranganathan should preside here on this occasion and present to the successful students of 1937 the prizes and medals gained by them in the session just finished.

3. We miss from our midst this year one of our oldest and most esteemed friends and well-wishers, Rao Bahadur K. S. Venkatarama Ayyar who has crossed the bourn and I offer on behalf of the Union our sympathy and condolence to his family and relations in their bereavement. Mr. Venkatarama Ayyar has been one of our benefactors on several occasions and the Goschen, Anstead and Venkatarama Ayyar medals to be awarded to-day bear testimony to his interests in this College and will serve to keep his memory green at such conferences as this, which he always took delight in attending. Rao Bahadur K. S. Venkatarama Ayyar was an Honorary Visitor to this College from 1930 till his death.

4. Last year our Conference took the form of a special celebration i. e. the Diamond Jubilee of Agricultural Education in Madras and the Silver Jubilee of the inauguration of the Madras Agricultural Students' Union. This year our celebrations are on a more restricted scale, but once again we have organised a working Exhibition in the Freeman Building where Departmental work will be demonstrated to all those interested in the scientific work of the Department. Owing to the absence of rains, the crops on the Central Farm are less prominent than is usual at this time of the year, but the Superintendent will be pleased to show visitors over the Botanic Garden, Garden lands and Orchard and some time can also be profitably spent in the Dairy, Farm Yard and Veterinary Hospital, all of which are active working units in our College organization.

5. So much for scientific work. The Union also entertains; and to-night the dramatic members will stage a series of dramas in English and the Vernaculars for the benefit of our guests. Our College Sports will be held on 24th when the Union will be 'At Home' to members and guests and will welcome a large attendance. It is unique that all these functions should be organized by a non-official body like the Madras Agricultural Students' Union whose object in doing so is to keep its members in close touch with its *alma mater*. The Secretary's report will indicate the varied activities of the Union and the amount of honorary work which the resident committee undertakes on its behalf.

It is the duty of all Officers of the Department to become members of the Union and I regret to note that a number of Departmental Officers still fail to realise it as such, although they attend our Conferences and enjoy our hospitality.

6. And now I come to the last item of my welcome address and that is to congratulate the winners on their successes and sympathise with those who just

failed to win. Prizes are an incentive to study but are not a guarantee of future success in life, where character and personality play a more important part.

To all who have taken their B. Sc. Ag. Degree and are now equipped for the battle of life I wish all success and I hope their future will lie along pleasant lines and that they will be able to add to the work of social advancement of the rural population. No work is more worthy than this.

To the Union's welcome I now extend my personal thanks for your presence here and for your assistance in making this conference a success.

List of Winners of Different Prizes for the year 1936-'37.

- | | |
|---|--|
| 1. The Robertson Prize. | T. N. Anantanarayanan |
| 2. The Clogstoun Prize. | H. Krishna Kumar. |
| 3. The Kees Prize. | T. N. Anantanarayanan. |
| 4. The Sampson Memorial Prize. | H. Krishna Kumar. |
| 5. The Diwan Bahadur R. Raguhnatha Rao Prize. | K. Venkatachalamayya Sastri. |
| 6. The D'Silva Memorial Prize. | K. V. Srinivasan. |
| 7. The Goschen Prize. | C. K. Seshadri. |
| 8. The Anstead Prize. | K. A. Seshu Ayyar. |
| 9. The Rao Bahadur K. S. Venkatarama Ayyar Prize. | Francis Samuel. |
| 10. The Certificate Course Cup. | P. Narayanan. |
| 11. The Old Cuddapah District Agricultural Association Prize. | T. M. Rama Ayyangar.
B. K. Mohan Rao.
Khader Razack. |
| 12. Sir T. Vijayaraghavachariar Prize. | S. V. Joseph Doss. |
| 13. The M. K. Nambiar Prize. | P. Narayanan. |
| 14. The L. D. Swamikannu Memorial Prize. | T. N. Ananthanarayanan. |

President's Address.

By Diwan Bahadur S. E. RANGANATHAN,
Vice-Chancellor of the Madras University.

I thank the Director of Agriculture, the Principal of the College and the organisers of the College Day and Conference for the honour they have done me in inviting me to be present on this important occasion. I have, as you are all aware, no special qualifications for occupying the presidential chair today as my knowledge of agriculture and of the problems connected with it as compared with that of the experts assembled before me is almost negligible. As the administrative head, however, of the University of Madras to which the Agricultural College is affiliated, I may claim to be somewhat closely connected with you, and I should like to take this opportunity of assuring you that I am deeply interested in the welfare and progress of this important institution. The College, since its affiliation to the University seventeen years ago, has made very steady progress, and has, I believe, produced nearly 400 graduates equipped with the most up-to-date knowledge of scientific agriculture. It is a matter for gratification that Madras has not only led the way in the matter of agricultural education in India, but has done probably more than many

other provinces for the improvement of agricultural methods and the social and economic betterment of the rural population. Apart from this College which has helped to disseminate modern knowledge regarding all aspects of agricultural activity and to train its students in scientific methods, the Agricultural Research Institute at Coimbatore has an impressive record of work to its credit and has earned a wide reputation for the results of its scientific research. Madras was again the first province to start Land Mortgage Banks for the benefit of the agriculturist. The establishment of Debt Conciliation Boards and District Economic Councils and the relief afforded to the ryot by the remission of a part of the land revenue and the recent stoppage of resettlement operations are other measures intended to deal with various aspects of the rural problem. While it is a matter for satisfaction that so much has been done, it has to be admitted that the measures adopted so far have not materially improved agricultural conditions, nor have they advanced the well-being of the rural population to any appreciable extent. The condition of the villages is so bad to-day that what we need is a comprehensive policy and manysided effort to deal effectively with the problem of village reconstruction. Happily public interest in this vital problem has been awakened in recent years, and besides Government, many voluntary organisations have been endeavouring to improve the conditions of rural life. It is a matter for gratification that the Congress Ministry is pledged to work for the amelioration of the lot of the rural masses, and it is significant that one of the new Ministers has been entrusted with the portfolio of agriculture and rural development. It is to be hoped that the new Government will make an exhaustive survey of the whole situation and devise suitable measures for the reconstruction of village life. It is appropriate, therefore, that at this time an expert organisation such as yours should have arranged for a symposium on the question of rural reconstruction. I am sure that the suggestions contained in the various papers to be read at this Conference and the discussions on them will prove to be of great benefit both to Government and to those engaged in rural uplift work. Whatever the proposals which may be made at this Conference—and I am sure there will be many, in connection with rural reconstruction—may I point out that education is one of the most important factors in the rehabilitation of village life and should occupy the foremost place in any scheme of reconstruction. We therefore need not only a well-equipped agricultural college and Research Institute, but a vast network of rural schools and demonstration farms through which knowledge in regard to agricultural and other related matters will reach the ryot living in his village.

The primary schools situated in rural areas—and they constitute more than 90% of such schools in the Presidency—should have an agricultural bias. One of the greatest defects of our present system of

education is that it is not rooted in the life of the people and is not relevant to their needs. At present, the rural schools are not very different from those situated in urban areas, and the results have been disastrous. While the instruction given in all primary schools may be the same, the village school should relate that instruction to the conditions of rural life. There should be a small farm attached to these schools where the boys could work under the guidance of the teacher. Improved methods of agriculture should be used in these farms, so that the parents of the children could witness the beneficial effects of such methods. Further, the general subject of Rural Science dealing with sanitation, health, village administration, cottage industries, gardening, cooperation and so on, would provide a suitable correlating agency, and the aims and ideals of rural reconstruction should be made to permeate the whole curriculum. The primary school should be made the centre of village life, the inspiration for adult education and the chief motive power of rural progress. If this is to be achieved, two things are essential. One is that the teachers employed in such schools should be men who have come from rural areas with the interests of the village at heart, and who have received a suitable training. Such training could be given by having a demonstration farm attached to some of the teachers' training schools, or by locating some of these schools near Government farms. There could be no real progress in rural education without a large body of teachers, capable of helping in practical farming and in subsidiary industries. And secondly there should be a proper co-ordination of the various departments of Government and other non-official agencies working in rural areas, such as those of Agriculture, Public Health, Education, Forestry and Co-operative Credit Societies. I believe that this co-ordination has been established in the Punjab in the form of a Central Rural Community Board and of District Community Councils.

Another problem is to sustain the interest of the boys after they leave school. This is admirably done in America and in England by means of extension work organised by the Government. In America the State Agricultural Colleges not only impart instruction but also maintain county agents for propaganda purposes. These men are usually College graduates, specially trained in demonstration work and possessing intimate knowledge of local conditions. They organise boys' and girls' clubs in rural areas, and through the Press and the Radio, they keep the farmers in touch with the latest developments in marketing and agricultural methods. In England, much progress has lately been made in the same direction. Young farmers' clubs have spread throughout the country, and they provide most valuable lessons not only in the proper management of crops and live-stock and in the business of keeping accounts and acquiring the habit of co-operation, but serve as a means of calling out the spirit of

self-government and the capacity to manage affairs. Similar work could be done in our country by the agricultural demonstrators scattered all over the Presidency. They could organise agricultural societies and impart to the ryots in their area the latest information regarding crops and markets. If rural reconstruction is to be really effective, a great concentration of effort is necessary for developing this field of our educational life. The problem of rural uplift is of such magnitude in our land that for its adequate solution careful planning, organisation, money and men are required, but men above all. While we may legitimately look to Government to formulate its plan with the aid of experts and to provide the necessary organisation and funds, we need a vast army of men and women, animated by a spirit of service, who will devote themselves to the work of rural uplift. As personal example is one of the most effective instruments of progress, we expect the well-to-do landed classes to live on their lands and demonstrate to the ryots round about them the advantages of adopting improved agricultural methods and of engaging in subsidiary industries. And we need a large body of educated young men and women who will go and settle and work in the villages, for the benefit of the agriculturist, regarding the amelioration of the condition of these people as the greatest service they could render to the country. For the rural problem is above all essentially a human problem. More important than roads and wells and the improvement of the amenities of the village is the peasant himself. Sunk in despair, much of his manhood has been crushed out of him. What he needs most is that the spirit of hope should be breathed into him, and the hand of fellowship stretched out to him so that he may recover his self-respect as a man and regain his hold on life.

Let me congratulate the Madras Agricultural Students' Union on its splendid record of work during the past year. It has done admirable work for over quarter of a century by organising these annual Conferences and by conducting the Madras Agricultural Journal, which has been the means of disseminating useful information on agricultural matters among a large body of readers. The value of such a voluntary organisation cannot be overestimated. We have seen how closely agricultural education is connected with the work of rural reconstruction. The Union will, I am sure, be called upon to play an increasingly important part in the coming years, when questions relating to agriculture will be in the forefront.

I wish both the outgoing students and those who will remain in the College all success. I hope they will realise the special responsibilities which rest upon them because of the scientific training which they have received in this College, and will make it their constant endeavour to use their knowledge to promote the well-being and happiness of the peasant for the benefit of the country as a whole.

Report of the Managing Committee for the year 1936-'37.

The Managing Committee of the Madras Agricultural Students' Union has great pleasure in presenting their report for the year 1936-'37.

With the warm interest evinced by His Excellency the Lord Linlithgow, the Viceroy of India, the welfare of the Agriculturist has received considerable attention. Livestock improvement has received a great impetus. Ameliorative measures like the reduction in the freight on dry cows and the abolition of the terminal tax on imported cows are but symptoms in this direction. District Economic Councils have started to function in the cause of the agriculturist. The special Tariff Board to examine the question of sugar production and trade, is another useful activity full of promise in the stabilization of the sugar industry. At the College, the institution of training for farmers' sons in practical agriculture is a measure of great usefulness. There has thus been a general alertness on the part of all concerned in the cause of rural uplift. On the inauguration of great constitutional changes, it may be permissible to note that such political advances in whatever direction they may be, will be deemed a success only in so far as they advance the cause and well-being of the large mass of cultivators who form the economic back-bone of the commonwealth.

The Union was founded in the year 1911 in which year the first conference under its auspices was held. Last year, the Silver Jubilee of the Union and the Diamond Jubilee of the agricultural education in the Madras Presidency was celebrated. These celebrations were inaugurated on the 29th July 1936, by His Excellency Sir K. V. Reddy Naidu, the Governor of Madras. The Conference continued on the 30th and 31st with the Hon'ble Mr. P. T. Rajan, the Minister for Agriculture, in the chair. Papers dealing with various subjects pertaining to agriculture were read and discussed. On the night of the 30th, the students of the college staged short scenes from English, Malayalam, Tamil and Telugu dramas. On the 31st the agricultural demonstrators of the VI Circle staged the drama written by Mr. C. S. Rajaratna Mudaliar of the mycology section. This drama is the one which secured the prize awarded by the agricultural department. On the fourth day, the 1st of August, the annual general body meeting of the members of the union was held in the forenoon. The College Day sports were held in the afternoon and the union was at home to the visitors. A comprehensive exhibition demonstrating the various activities of the department and the results achieved therefrom was held in the Freeman Building. The exhibition was opened by H. E. the Governor on the 29th July and was kept open to the public till the 2nd of August. A detailed account of the proceedings of the Jubilee celebrations and the agricultural conference has already appeared in the August 1936 number of the Madras Agricultural Journal.

The Madras Agricultural Journal. Besides celebrating the annual College day and Conference the all-the-year activity of the Union is the publication of the Madras Agricultural Journal. The committee is glad to report that the journal continued to maintain the high standard associated with it. The journal has secured a place among the agricultural journals of the world and has on its exchange list a wide range of publications from many foreign countries.

Our New Patron. Mr. G. R. Hilson, who held various responsible posts in the Madras Agricultural Department and who retired as Director of Agriculture, has very generously become a patron of the Union. We place on record our grateful thanks to him for this tangible proof of the interest in the Union of which, he was a former President.

Honours. Two of our members were the recipients of honours during the year. M. R. Ry. Rao Bahadur T. S. Venkatraman Avl., Government Sugarcane

Expert was made a Companion of the Indian Empire; and the title of Rao Sahib was conferred on M. R. Ry. G. Jogi Raju Garu, Assistant Director of Agriculture. We are glad to note that the title of Rao Bahadur was conferred on M. R. Ry. Rao Sahib N. S. Kulandaswami Pillai, Avl., Deputy Director of Agriculture. We offer our hearty congratulations to these gentlemen on the well merited honours conferred on them for their services in the betterment of the agriculturist.

Unemployment. It is gratifying to record that considerable relief in unemployment has been obtained by the recent absorption of a large number of our old boys into the service of the agricultural department. It is our hope that measures will be devised by which the demand for the agricultural graduates will be insistent and that there will be many calls for service on these usefully trained young men in the coming expansion in rural reconstruction.

Our Friends abroad. Four of our members, Messrs. N. Parthasarathi, V. Panduranga Rao, N. Krishnaswami and N. Kesava Ayyangar have gone abroad for advanced studies. The Union wishes them every success. It gives us pleasure to learn that Mr. V. Panduranga Rao has been elected as an active member of the honorary scientific fraternity Sigma Xi, and that Mr. S. Ramanujan has been awarded the Ph. D. degree of the London University. One of our enthusiastic members, Mr. K. M. Thomas returned after advanced studies with the Diploma of the Imperial College, London, and has been appointed as Mycologist. We take this opportunity to congratulate all these members on the distinctions attained.

We record with pleasure that another of our enthusiastic members Mr. K. Ramaiah was appointed Geneticist at Indore. We wish him all success in his new sphere of activity.

Retirement. Since the last College Day and Conference, M. R. Ry. Rao Bahadur S. Sundararama Ayyar Avl., and M. R. Ry. Rao Sahib C. Narayana Ayyar Avl., retired from service. Both of them have been connected intimately with the activities of the Union. The following members of the Department also retired during the year: Messrs. C. V. Seshacharya, G. Venkatachalapathi Raju, and D. Srinivasa Rao. Our old members may remember that Mr. D. Srinivasa Rao was for some time the treasurer of the Union. We wish them all long life, health and happiness.

Obituary. We have to record with regret the demise of Mr. Allan Carruth, formerly Deputy Director of Agriculture, Livestock, and one of the patrons and a constant well-wisher of the Union. Another loss is the passing away of M. R. Ry. Rao Bahadur K. S. Venkatarama Iyer Avl., of Negapatam, a regular subscriber and contributor to the Journal and an active participant in our annual conferences. He has very generously instituted three prizes for the students of the college, namely, the Goschen Prize for Agricultural Zoology, the Anstead prize for Plot Cultivation and the Rao Bahadur K. S. Venkatarama Iyer Prize for the best student in the First Examination. The Union deeply mourns his loss. We are sorry to record the passing away of the following members of the Agricultural Department namely Messrs. C. S. Madiiah, M. Eggiaswami Iyer and A. Ramalinga Ayyar.

Acknowledgments. It is now our pleasant duty to record our thanks to all who have helped the Union during the year. To Sir K. V. Reddy Naidu, the Union owes a deep debt of gratitude for presiding over the Jubilee celebrations last year. To Mr. P. T. Rajan who presided over the Conference and to Mrs. R. W. Littlewood who distributed the prizes on the sports day, we record our grateful thanks. To M. R. Ry. Rao Bahadur D. Ananda Rao Garu, the Director, the Committee tenders its heartfelt thanks for his keen interest in the Union and the invaluable help rendered by him in arranging for the Jubilee celebrations.

To Messrs. R. W. Littlewood and R. C. Broadfoot, who as Presidents have been actively helping the Union in its various activities, we tender our grateful thanks. We are specially indebted to Mr. and Mrs. M. C. Cherian for helping us in the arrangements for the tea on the sports day. To all other ladies and gentlemen who in various capacities have helped the Union in the jubilee celebrations, as well as in its everyday activities during the year, we record our grateful thanks.

Conclusion. We conclude this report with a fervent appeal to all gentlemen who are not yet members of the Union to join it and become subscribers to the Journal. By doing so they profit themselves and enhance the reputation and usefulness of the Union.

Agricultural Jottings.

(From the Department of Agriculture, Madras.)

THE MAHALI DISEASE OF ARECANUTS. A WARNING TO ARECA GROWERS

Mahali or *Koleraga* is the most destructive disease of arecanuts in South India. It is caused by a parasitic fungus (*Pythophthora arecae*) which flourishes in very wet weather. Hence it occurs in areca-growing tracts where the monsoon rains are very heavy. In South India, the disease is known to appear every year in the districts of Malabar and South Kanara, in the *malnad* districts of Mysore province and in the states of Cochin and Travancore. The disease usually attacks growing nuts causing rotting and shedding. Under favourable monsoon conditions, the disease may appear with such intensity as to destroy the whole crop. Occasionally, the disease attacks the crown of the areca palm and causes the death of the tree.

Control. A very efficient method of controlling the disease is now known. It consists in spraying on the areca bunches a mixture (called Bordeaux mixture) which on drying serves as a protective coating. Several garden owners are adopting this method of control year after year with conspicuous success. During the last monsoon, the disease broke out in epidemic form in South Kanara and those who carried out timely spraying were able to save their crops, while others who did not do the spraying lost heavily. In particular tracts the whole crop was lost and those garden owners to whom their areca garden was the sole means of livelihood found themselves in an utterly helpless position. To obtain the maximum benefit, the areca bunches should be sprayed twice—one just before the outbreak of the monsoon when the nuts are small, and again some weeks (about six weeks) later when the nuts have grown bigger. The spray mixture can be prepared by garden owners from ingredients which are obtainable in village bazars in areca growing areas. English and vernacular leaflets issued by the Madras Department of Agriculture and giving particulars of the methods of preparation of the mixture and the use of the spraying machine can be obtained free from the agricultural demonstrators in the districts of Malabar and South Kanara or from the Deputy Director of Agriculture, Tellicherry, who will be glad to furnish any further information to areca growers.

A Superior Cotton for the Tinnevely Tract. The Tinnevely tract comprising the three districts of Madura, Ramaad and Tinnevely grows cotton annually on an extensive area of over 500,000 to 600,000 acres. The type of cotton under cultivation has a good reputation for its quality. Work on the improvement of cotton at the Koilpatti farm was started as early as 1902. But after repeated trials of many varieties it was found that Karunganni cotton was the most

suitable and work was concentrated on this variety from 1937 onwards. Several types were evolved in 1913 and distributed for cultivation. Further selections were continued and as a result, C-7 and A-10, two superior types were isolated. These were made available for general cultivation in 1925 and found suitable for several tracts and the area under C-7 alone was by 1935 increased to over 90,000 acres extending into the Coimbatore and Trichinopoly Districts.

Although C-7 is a good yielder with a good ginning outturn and capable of spinning up to 28's standard warp counts, it suffers from a serious defect, like other Karunganni cottons grown in this tract, in being susceptible to heavy boll shedding if a rain is received in February. As a result of further work, a type has now been evolved which on account of its earliness and vigour escapes the untimely rains and produces a good crop. It gives a better yield than C-7; the ginning outturn is as good and the spinning performance is also slightly better. This cotton is named K. P. T. I. and the seed was ready for distribution in 1934. The cotton did so well in the different localities where it was tried, that the area is rapidly extending and the demand for the seed increasing. In the course of a few years this strain is expected to completely replace C-7 in the Tinnevely area.

Compost making in Municipalities. It is common knowledge that a well nourished mother means a well nourished child. The same is the case with Mother Earth. Well nourished or well manured land produces a well-fed plant, which contributes to the health of both man and beast. The health of man is therefore intimately bound up with the proper nutrition of the soil.

Good manure both rich in quality and quantity is becoming more and more scarce, owing partly to faulty methods of making and preservation of manure adopted by the ryots. It is well known that a good proportion of cattle dung is burnt as fuel and insufficient attention is given to the conservation of the urine of farm-stock. The department has been teaching the ryots better methods of preservation of Farm Yard Manure. But this is not enough. Efforts must be made to utilise as manure all the voids (both solid and liquid) of man and beast. The ryot should try to return as much plant-food to the soil as is taken away by the crops raised thereon; but sentiment seems to be against the use of the voids of human beings due mainly to its offensive smell.

The following is a short account of attempts to make compost at Proddatur.

All municipal waste material that was available was made use of in composting and which amounted to 60 cubic feet of rubbish and 15 cubic feet of night soil per day on an average. Trenches of 45' x 15' x 2' 8" were dug to hold the material. A cartload of rubbish was first put in and a cart-load of night soil tipped over it and then a cart-load of rubbish on the top. This was mixed and drawn to form a layer of four inches. The process was repeated till layers of four inches depth were formed one over the other and until a height of 2' 8" was reached. The heaps formed in the trench measured 12' x 3' x 2' 8". The next day's material was similarly treated and built up adjoining that of the previous day. The process was thus repeated daily disposing of all the rubbish and night soil that was coming to the dumping ground.

The compost manufactured during a period of two months from 23rd December 1936 to 23rd February 1937 was auctioned in the middle of March 1937 and it brought in an income of Rs. 189. Nine months' material of the old process was auctioned for only Rs. 500 the night soil being left unsold, because the bid was only Rs. 25. It is thus seen that the extra annual income obtained by making compost is Rs. 455 as compared to the old process. The extra expenditure involved per annum worked out to Rs. 132 for scavenger's wages and Rs. 35 for water supply. Thus a net gain of Rs. 289 was obtained by this process. From

the demand for a month's material on hand it is observed that this manure will be used widely.

Sindwahe Furnace for Turmeric Boiling. This furnace has become well known to all sugarcane growers of this presidency for the manufacture of jaggery using megasse and cane trash as fuel. The saving in fuel and other items of expenditure by the use of this furnace is on an average Rs. 25 to Rs. 35 per acre in Kurnool and Cuddapah districts. The furnace which was introduced for the first time at Kodur to demonstrate the economy of fuel in the manufacture of jaggery was utilised for boiling turmeric using only the dried leaves of the turmeric plant which were hitherto going to waste. The cost for boiling by the local furnace using fire-wood and date leaves worked out to Re.1 whereas by the new method it came to only four annas. There was thus a saving of Rs. 0-12-0 per charge or Rs. 9 per acre. In view of the fall in prices of turmeric any saving in the cost of production must be welcome to all turmeric growers.

Persian Wheel Water Lifts. Where there is a will there is a way. A local resident of Kodur was advised to fit up a Persian wheel water-lift to his well to irrigate an Orange garden. The depth from ground level to the water-level was 30 ft. Fifty two buckets were used and two pairs of cattle were employed to work the lift. By means of the lift 3 acres per day was irrigated. The land-lord was hitherto using four pairs to work two mholes for the same area. There was thus a saving of two pairs of cattle and two men per day which may be valued at Rs. 5. It seems certain therefore that this lift can be used for depths beyond 27 feet the maximum specified by the manufacturers.

EXTRACTS

"The prodigious activities of a hen belonging to Signor Vincenzo Massa, of Cerignola, in the province of Bari, are reported by a Florence newspaper. This hen, presented to Signor Massa by a poor woman on January 28th has laid 122 eggs in 40 days with a maximum of twelve eggs in a single day. The meritorious fowl is of native breed and normal size, and the eggs for size, content, and hardness of shell are all equally normal". (*The Veterinary Record*, Volume 49, No. 13, dated March 27, 1937.)

K. U. M.

Gleanings.

Biochemistry in relation to Agriculture by Sir John Russell *Curr. Sci.* Feb. 1937.

In view of the opinions regarding the diet of the Madrasi expressed from time to time by authorities, the opinion of Sir John Russell would prove of more than ordinary interest. In his view, the average consumption of grain by the Indian ryot works out to be about one pound per head per day; the normal food of the Punjabi consists of 50% wheat, 30% gram and the rest of cereals which should furnish a diet very rich in proteins. In Bengal, the diet was very poor in protein and was almost wholly composed of rice. In Madras they had an intermediate sort of diet, rice accounting for 70% and the rest being made up of protein foods.

S. K.

College News and Notes.

We gather from "The Lincoln Star" that one of our members, Mr. V. Panduranga Rao, has been voted as one of the 19 active members of the Honorary Scientific Fraternity, Sigma XI. We congratulate Mr. Rao on this distinction.

The College re-opened on the 15th June after the Summer vacation and freshers arrived on the 2nd of July.

The following members were elected as office bearers on the Students' Club for the year.

Club Secretary: C. K. Seshadri.

Games „ : M. Mukundan.

Captains for the games :—

Cricket: K. Dinker Rao

Hockey: V. Brahmanandham.

Foot-ball: Md. Zainullabudin.

Tennis: V. Ramana.

Representatives of the classes :—

Class III T. M. Kini.

„ II K. Mahabala Shetty.

„ I Kesava Reddi.

All the games are in full swing.

Two matches were played; one a cricket match against the Stanes High School which the college creditably won; the other was a hockey match played against the Recruits which ended in a draw.

We record with much regret the demise of Rao Bahadur K. S. Venkatarama Ayyar of Negapatam, one of our ardent well-wishers, and a regular subscriber of the Madras Agricultural Journal. He was one of the few educated mirasdars who took a keen interest in the Agricultural Department and its activities, and contributed not a little to the liveliness and usefulness of the discussions at the annual Conferences of the Union. He was a liberal donor to the Union and had instituted three prizes for the students of the Agricultural College. The Union deeply mourns his loss.

WANTED AGRICULTURAL GRADUATES

I

A Mirasdar in Srirangam wishes to have the services of an Agricultural Graduate to help him in the management of 1000 acres of wet land, 300 acres of dry land including fruit gardens situated in Tanjore and Trichinopoly districts.

Qualified persons desirous of undertaking this management may apply to the Secretary, Madras Agricultural Students' Union, Lawley Road P. O., for further particulars.

II

The Manager, The India Sugars and Refineries, Limited, Hospet, Bellary district, wishes to employ a few agricultural supervisors to supervise the cultivation of sugarcane and other economic crops and also to advise and look after the ryots supplying cane to the factory. Persons selected for the purpose will be on probation for a period of six months during which time they will be paid Rs. 40/- per month. If during the probationary period their conduct proves unsatisfactory, their services will be terminated without notice. No travelling allowance will be paid for the journey to join duty. When the probationary period is completed satisfactorily, they will be started on a graded scale to be fixed later on. Intending candidates may apply to the above address for further particulars.

Weather Review (MAY 1937).

A temporary advance of the monsoon occurred on 17th in the neighbourhood of Ceylon. The monsoon became active on 19th and later weakened after making a feeble advance along the Malabar Coast. In the beginning of the last week, it became strong from Comorin to Arakan and caused thunder rain in Mysore, South-east Madras and Malabar. Throughout the last week the monsoon was strong and active to the west of Ceylon and in the Bay of Bengal.

Thunder showers were general with local rains all over the Peninsula.

Rainfall was in large defect throughout the peninsula and markedly so in the West Coast.

RAINFALL DATA

Division	Station	Actual for month	Departure from normal @	Total since January 1st	Division	Station	Actual for month	Departure from normal @	Total since January 1st
Circars	Gopalpore	2.7	0.7	12.1	South	Negapatam	...	-1.6	8.9
	Calingapatam	1.5	1.1	7.0		Aduthurai *	1.1	0.9	4.2
	Vizagapatam	2.1	0.1	7.9		Madura	0.8	-2.1	2.3
	Anakapalli *	...	...	...		Pamban	0.6	-0.2	10.8
	Samitkoti *	0.8	0.5	9.4		Koilpatti *	1.4	-0.6	7.7
	Maruteru *	1.3	0.5	4.4		Palankottah	0.5	-1.1	6.8
	Cocanada	0.8	1.2	7.2	West Coast	Trivandrum	2.9	5.5	16.7
	Masulipatam	0.1	1.2	5.1		Cochin	4.3	7.4	15.4
	Guntur *	0.7	1.6	3.8		Calicut	4.8	3.7	10.7
Ceded Dists.	Kurnool	...	1.0	4.4		Pattambi *	3.4	5.9	7.4
	Nandyal *	...	1.5	7.1		Paliparamba *	...	...	...
	Hagari *	0.6	1.4	4.3		Kasaragode *	4.2	3.9	11.3
	Bellary	0.7	1.3	5.8		Nileshwar *	3.2	6.3	7.6
	Anantapur	1.7	0.4	6.3		Mangalore	2.9	-3.3	7.4
	Rentachintla	1.0	...	...	Mysore and Coorg	Chitaldrug	1.7	2.4	2.8
	Cuddipah	0.1	1.5	5.3		Bangalore	4.5	1.4	13.5
	Ananthurajpet *	1.2	0.7	5.4		Mysore	9.4	1.8	15.3
Carnatic	Nellore	0.1	0.7	29.9		Mercara	2.2	3.5	11.6
	Madras	...	1.1	2.7	Hills	Kodaikanal	6.9	0.9	18.8
	Palur *	...	1.9	4.1		Coonoor *	2.7	...	24.8
	Pindivanam *	0.7	0.8	3.4		Ootacamund *	2.6	4.7	16.2
	Cuddalore	...	0.7	3.7		Nanjanad *	1.9	4.2	11.9
	Vellore	0.7	1.6	5.1					
Central	Salem	3.1	1.6	5.5					
	Coimbatore	2.7	1.3	6.8					
	Coimbatore								
	A. C. & R. I. *	3.9	10.7	9.8					
	Trichinopoly	1.2	1.8	9.8					

* Meteorological Stations of the Madras Agricultural Department.

@ From average rainfall for the month calculated upto 1935 published in Fort St. George Gazette.

Weather Report for Research Institute Observatory.

May 1937.

Absolute maximum ... 96.5 F.
 Absolute minimum ... 70.5 F.
 Mean maximum ... 93.7 F.

Departure from normal	...	- 0.6.
Mean minimum	...	73.7.
Departure from normal	...	0.2.
Total rainfall	...	3.93".
Departure from normal	...	0.72".
Heaviest rainfall in 24 hours	...	1.21" recorded on 26th.
No. of rainy days	...	7.
Mean daily wind velocity	...	1.8 M. P. H.
Mean Humidity at 8 hours	...	72.7%.
Departure from normal	...	- 2.0%.

Summary. The mean maximum and the mean minimum were about the normal. The mean humidity was in defect by 2%. The rainfall was in excess by 0.72" and the heaviest rainfall was 1.21", recorded on 26th of this month. The skies were moderately to heavily clouded during this month. P. V. R. & P. G.

Departmental Notifications.

1. Promotions.

M. R. Ry. K. Hanumantha Rao Avl., Assistant Agricultural Demonstrator, Nandalur from IV to III grade to take effect from 1st July 1937.

M. R. Ry. S. Bhima Raju Avl., Agricultural Demonstrator from V to IV grade to take effect from 1st July 37.

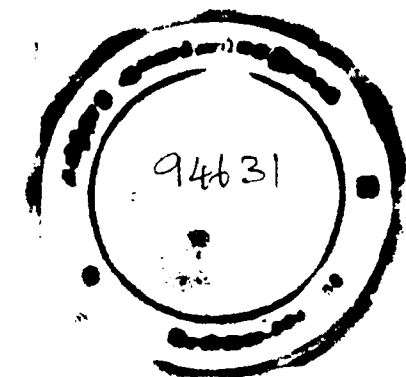
M. R. Ry. M. A. Sankara Ayyar, Avl., Assistant, Millets Section, Coimbatore from V to IV grade to take effect from 26th February 36.

2. Transfers.

Name of officers.	Transferred	
	From	To
Mr. S. Viravaratha Raju	A. D. Avanashi	A. D. Chittoor.
" K. Virabhadra Rao	A. D. Vizagapatam	A. R. S. Samalkota.
" Uchil Ananda	F. M. Kasargod	F. M. Pilicode.
" B. G. Narayana Menon	A. D. Coimbatore	VIII Circle.
" K. M. Narayanan	A. R. S. Taliparamba	A. R. S. Kasargod.
" V. M. Ramunni Kuduva	A. D. on leave	A. R. S. Taliparamba.
" P. S. H. Narayanaswami Naidu	F. M. Anakapalli	F. M. Gudiyatam.
" K. Krishna Murthi	A. D.	F. M. Anakapalli.
" R. Vasudeva Rao Naidu	F. M. Gudiyatam	F. M. Samalkota.
" V. Achyutha Ramiah	A. D. II Circle	A. D. I Circle.
" T. Paramanandam	A. D. Nandigama	A. D. Madanapalli.
" S. Kanakaraj David	Paddy Section	Chemistry Section.
" S. Ramanujam	"	Fruit Research Station, Kodur.
" V. G. Dhanakoti Raju	A. D. Usilampatti	A. D. Melur.
" C. S. Namasivayam Pillai	A. D. Melur	A. D. Tenkasi.
" P. R. Subramanya Iyer	A. D. Usilampatti	A. D. Sivaganga.
" M. Edwin Amirtha Raj	A. D. Sivaganga	A. D. Kodaikanal.
" J. S. C. Antony	A. D. Nanguneri	A. D. Mudukulattur.
" S. Muthuswami	F. M. Koilpati	A. D. Thirumangalam.
" A. K. Ganesa Iyer	A. D. Thirumangalam	A. D. Paramakudy.
" Joshua Moses	A. D. Ramnad	for training at Madura.

3. Leave.

Name of officers.	Period on leave.
Mr. K. H. Subramanya Iyer, A. D., Erode.	1. a. p. for 2 months from 2 July 1937.
" M. V. Kondal Rao, A. D., Vinukonda	1. a. p. for 3 months from 10 July 1937.
" S. Kuppuswami Iyengar, A. D., Sriperumbudur	1. a. p. on m. c. for one month from 28-6-37.
" R. Narasimha Iyer, A. D., Mycology	1. a. p. for 27 days from 5th July 37.
" P. Kannappa Pillai, F. M., Tinnevelly	Extension of 1. a. p. on m. c. for 3 months from 4th May 37.
" T. K. Balaji Rao	Extension of 1. a. p. for one month and 22 days from 21st June 37.
Mr. S. P. Fernando, A. D., Bhavani	1. a. p. for 15 days from 8-7-37.
" P. Nagadhara Naidu, A. D.	1. a. p. for 2 months from 10 July 37.
" M. Ratnavelu, A. D., Gingee	1. a. p. for 3 months from 12 July 37.
" P. K. Parameswara Menon, A. D., Namakkal	1. a. p. for 3 months 23rd August 37.
" N. Srinivasa Rao, A. D., Hosur	1. a. p. for 15 days from the date of relief.
" A. K. Ganesha Iyer, A. D., Thirumangalam.	1. a. p. for 2 months from 15th July 37.
" K. Ramanujachari, A. D.	1. a. p. for 2 months on m. c. 5th June 37.
" K. Saptharishi, Chemist, Pampheres Physiological Scheme	1. a. p. for 2 months from 4-8-37.
" V. Ramaswamy Mudaliar, Madras Herbaceum Scheme.	1. a. p. for one month and a half from 26th July 37.



The Madras Agricultural Students' Union.

PATRONS

V. Arumugam Pillai, Sundaikamuthur, Coimbatore District.
 Dewan Bahadur C. Arunachala Mudaliar, Zamindar of Chunampet, Chingleput
 Lodd Govindoss, Madras. [District.
 A. M. Kalinga Rayar Zamindar of Uttukuli, Coimbatore District.
 Raja Sree Krishnachandra Gajapati Narayana Deo Garu, Rajah of Parlakimidi,
 Ganjam District.
 V. Madhava Rajah, Kollengode, Malabar District.
 Sir A. P. Patro, Berhampur.
 T. A. Ramalingam Chettiar, Coimbatore.
 Sir C. P. Ramaswami Ayyar, Madras.
 Dewan Bahadur C. S. Ratnasabapathi Mudaliar, Coimbatore.
 M. Sambandam Mudaliar, Coimbatore.
 Veerarayan Thirumalpad, Nilambur, Malabar District.
 Hon. V. C. Vellingiri Gounder, Coimbatore.
 Raja Sir Venganad Vasudeva Rajah, Kollengode, Malabar District.
 C. V. Venkataramana Ayyangar, Coimbatore.
 R. Jeevandas, Varnasi, Parlakimidi.
 G. R. Hilson Esq., England.

OFFICE BEARERS FOR 1936—37

1. Mr. R. C. Broadfoot, Principal, President, Ex-Officio.
2. Rao Bahadur G. N. Rangaswamy Iyengar, Vice President.
3. Mr. V. Ramanatha Ayyar, Editor, Madras Agricultural Journal.
4. Mr. M. A. Sankara Ayyar, Secretary.

COUNCILS (15)

President
 Resident Vice President
 Editor
 Secretary
Mofussil Vice Presidents.
 Mr. K. Gopalakrishnaraju.
 Mr. K. Unnikrishna Menon.
 Rao Sahib G. Jogiraju.
Mofussil Members.
 Mr. K. T. Alwa.
 Mr. C. V. Saravayya.
 Mr. C. Ramaswami.
 Mr. K. S. Ramanna Rai.
Resident Members
 Rao Sahib Dr. T. V. Ramakrishna Iyer.
 " V. Muthuswami Iyer.
 " T. V. Rajagopalachari.
 Mr. D. Krishnaswami Naidu (Student).

MANAGING COMMITTEE (9)

Vice President.
 Editor.
 Mr. M. A. Sankara Ayyar, Secretary.
 Mr. R. Balasubramanian, Manager.
 Mr. T. S. Lakshmanan, Treasurer.
 Mr. C. S. Krishnaswami, Member.
 Mr. S. Ramachandran "
 Mr. K. Ramaswami "
 Mr. B. M. Pinto (Student) "

EDITORIAL BOARD (7)

Editor.
 Secretary.
 Manager.
 Dr. J. S. Patel.
 Mr. K. Ramiah.
 " M. U. Vellodi.
 " P. K. Subrahmanian (Student).

P. S. G. & SONS' CHARITY INDUSTRIAL INSTITUTE

Peelamedu, COIMBATORE (S. I. Ry.)

P. S. G. & Sons' Charity Industrial Institute is an Institute recognised by Government to impart instruction in Mechanical Engineering, Carpentry, Textiles, Electric Wiring & Printing. There are ample facilities for theoretical and practical training of pupils and also for Boarding & Lodging.

WE MANUFACTURE :

REELING MACHINES,
SUGAR CENTRIFUGALS
CENTRIFUGALS PUMPS
DECORTICATORS,
COTTON GINS
SUGARCANE BELT POWER
ROLLER MILLS
OIL FILTER PRESSES
OIL FILTER PRESS PUMPS
DISINTEGRATORS
CAST IRON ROPE AND BELT
PULLEYS,
GEAR WHEELS
ORNAMENTAL RAILINGS

REPAIRERS OF :

OIL ENGINES,
GAS ENGINES
STEAM BOILERS
STEAM ENGINES
ALL KINDS OF OTHER
MACHINERY
ALL KINDS OF WOODEN
FURNITURE
SCIENCE APPARATUS AND
FITTING

AGRICULTURAL IMPLEMENTS

ELECTRIC WELDING,

AND WE UNDERTAKE ERECTION OF ALL KINDS OF
MACHINES AND STRUCTURAL WORKS

We also manufacture Ball Bearing Mhote Wheels of the improved type, Bund Formers, Buck-scrapers, Triangular Harrows, Seed Drill, Ridge Plough and ploughs of various kinds and other implements useful to the ryots and offer them to the public at comparatively low price.

We solicit a trial

Rao Bahadur P. S. G. RANGASWAMI NAIDU,

Managing Trustee.

When answering our advertisers, please mention 'THE MADRAS AGRICULTURAL JOURNAL'

Editor : V. Ramanatha Ayyar.

Printed at The Scholar Press, Palghat.