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

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THE THIRTIETH COLLEGE DAY AND AGRICULTURAL CONFERENCE, 1941.

The thirtieth College Day and Agricultural Conference organized by the Madras Agricultural Students' Union, Coimbatore, was held between 10th and 13th July. In spite of the economies that have to be enforced during the period of war, it is a matter of great satisfaction to us to note, that the Union found it possible to celebrate, this year also, quite successfully the College Day and the Conference. But for the wonted kindness of the Director of Agriculture, this would not have become an accomplished fact. The Director of Agriculture not only expressed great regret at the absence of the bulk of those who had contributed papers which made the discussions on these papers very weak, but went even so far as to say that in future he would depute all those who contributed papers for this conference which is indeed very gracious on his part. We expect therefore the future conferences to be very lively and thought-provoking.

The Madras Agricultural Students' Union was lucky in getting Dr. C. R. Reddy, the Vice-chancellor of the Andhra University, to preside over the College Day and Conference. At 12 noon on Thursday the 10th July, Dr. C. R. Reddy the president-elect was received at the entrance to the conference hall by Messrs P. H. Rama Reddy, the Director of Agriculture, Madras, R. C. Broadfoot, President of the Union and C. R. Srinivasa Ayyangar, Vice-President.

Mr. R. C. Broadfoot, welcomed the large and enlightened gathering with a welcome speech. The Secretary then read several messages received from the patrons, members, friends and well wishers of the Union who regretted their inability to be present but accorded their best wishes to the success of the conference. The Annual Report of the Union was then read by the secretary.

The chairman then delivered his presidential address (reproduced elsewhere) which was as inspiring as it was learned and was listened to by the gathering with rapt attention. He complimented the Coimbatore Agricultural College on the high standard of training given, and said that its researches had become world famous. It was really unfortunate Dr. C. R. Reddy was not keeping good health and as such, soon after he concluded

his presidential address, he had to leave the conference. Mr. P. H. Rama Reddy, the Director of Agriculture, took his place and conducted the rest of the proceedings. This year the papers read formed a Symposium on Fruit Culture in South India and they were ten in all. Interesting discussions followed as usual and the only feature to be regretted was the authors of the papers in many cases were absent.

The chairman of the Conference Dr. C. R. Reddy gave away the prizes and medals won by the students of the college during the academic year 1940—41 and the Ramasastrulu—Munagala prize to Sri. A. Sankaram, B. Sc. (Ag.), at the end of which he humourously remarked, "usually a lady is chosen for giving away the prizes. I do not know why I have been asked to do this".

On the 11th, the second session of the Conference was held from 9 A. M. to 12 noon, when the second batch of five papers were read. The president wound up the proceedings by a summing up of the papers and the discussions which followed, and expressed sorrow at the absence of the authors of the papers, and ended by appealing to the members of his staff in the department to make strenuous efforts to help the cause of the ryot.

Mr. C. R. Srinivasa Ayyangar, the Vice-President of the Union, proposed a vote of thanks to Mr. Rama Reddy for having kindly presided over the function in the unavoidable and very much regretted absence of Dr. C. R. Reddy. He also thanked the several members of the Union and friends who contributed to make the conference and other functions a success.

On the 10th night the members of the Union entertained the visitors, when short pieces in English, Telugu and Tamil were staged. A noteworthy feature connected with the entertainment of this year is that the best actor in each play was awarded a medal.

Saturday, the 12th July witnessed the College Athletic Sports. The members of the Union and other guests from the town were entertained while the sports was going on, with fine music by means of a radio with loudspeakers connected to it. The Union was "At home" to the large gathering of members and guests who had congregated to witness the contests. At the end of the sports Mrs. Imamuddin kindly gave away the trophies and prizes to the successful competitors. On the 13th morning the members of the Union met in the Freeman Hall where the Union was "At home" to its members. After *chota hazri* they adjourned to the conference hall where the annual general body meeting of the Union was held under the chairmanship of Mr. R. C. Broadfoot, President of the Union. The annual report and statement of accounts were adopted and the office bearers for the year 1941—42 were elected.

The afternoon was spent in visits to the Research Institute, Central Farm and Crop Breeding Stations where the visitors were shown round the work in progress and the results achieved in the immediate past. There was also a friendly cricket match between the Old Boys and the Rest.

Welcome Address.

(By R. C. Broadfoot, Principal and President of the M. A. S. Union).

Mr. President, Ladies and Gentlemen,

Once again it is my privilege to extend to all present, the Madras Agricultural Students' Union's welcome to this the 30th College Day and Conference—a function organized by the Union to revive college associations among its members.

To you, Sir, I would express the Union's grateful thanks for accepting its invitation to preside on this occasion. As Vice-Chancellor of the Andhra University you are known for your high literary attainments, as a member of the Legislature for your robust political experience and views, and now as President of this gathering for your interest in agriculture—a worthy addition to your other attainments. We regret your engagements curtail the duration of your present visit, but we hope that some day in the near future you will return and view the Agricultural College and Research Institute in its working garb. I can assure you there is much of interest to show the scientifically trained visitor.

We are pleased to welcome also Mr. P. H. Rama Reddy, Director of Agriculture, whose interest in the Union extends over two decades. We regret the recent retirement of two of our most active members, Messrs. K. T. Alwa and K. Unnikrishna Menon. We wish them peace and joy in retirement and hope they will continue their valuable assistance to the Union.

Once again we meet under the heavy shadow of the war cloud—a cloud which has grown bigger and more ominous within recent months. In the face of war it is difficult to talk of peace, but we hope the day is not far distant when peace of a lasting type will replace the present unsettled state of the World and will permit people to pursue their peaceful vocations.

To-day's symposium deals with fruit culture in the Madras Presidency—a branch of horticulture which has only recently received scientific attention. It is hoped that all who can, will take part in the discussions on the paper read and by so doing add to our knowledge of the subject. As usual visitors will be shown round the respective Research Sections, Breeding Stations, and Central Farm. Previous advice to the Heads of the Sections concerned is desirable in order that arrangements can be made for a suitable guide or demonstrator.

Last year's examination results while not up to the previous years, were not unsatisfactory, and 41 candidates have qualified for the degree and now seek suitable employments. Their future prospects are a matter of some concern to this College as they are likely to affect future applications for admission. There has been a considerable drop in the number of applications for admission to the current session and the class is not yet up to its full strength. Prizes will be presented to the prize-winners of 1940-41 session at the close of the Presidential Address and I wish to congratulate all winners on their successes resulting from hard and diligent work. I would here remind all graduates that there are still prizes to be won in all careers, and hard work and diligence are factors which will always contribute to success.

I have little more to add except to require that students leaving the College keep in touch with the Union and by becoming members, help to expand the work which has been so well done during its 30 years' existence.

Besides welcoming you on behalf of the Union I express the pleasure it gives me to welcome you all on this occasion.

Messages.

Messages wishing the College Day and Conference success were received from the following:—H. M. Hood, Adviser to H. E. the Governor of Madras; Dr. Gilbert Fowler, Madras; Dewan Bahadur D. Ananda Rao, Madras; Principal Alexander Gnanamuthu, Tinnevely; Rai Bahadur Nallathambi Sarkarai Manra-diyar, Pattagar of Palayakottai; Rao Bahadur B. Viswanath, New Delhi; Rao Bahadur K. T. Alwa, Mangalore; Rao Sahib M. Ananta Narayana Rao, Madras; Mr. Nizamuddeen Hyder, Hyderabad; Mr. A. K. Menon, Calicut; Rao Bahadur M. R. Ramaswami Sivan, Anand; Mr. P. V. Hanumantha Rao, Panyam; Mr. Ghulam Dastagir Sahib Bahadur, Coimbatore; Mr. Sitarama Patrudu, Samalkot; Director of Agriculture, Poona; and Messrs R. G. Nallkuttalam Pillai, Srivilliputhur; K. R. Sanker, Pudukotah, and G. Satyanarayana, Ramachandrapuram.

Report of the Managing Committee for the Year 1940—41.

(Presented before the open session, July 10, 1941)

Mr. President, Ladies and Gentlemen,

The Managing Committee of the Madras Agricultural Students' Union have great pleasure in presenting their report for the year 1940—41.

The War. The period under report has been none too bright for us. The European war that commenced in 1939 has developed into a world war. Hitler and his associates by threat, by force or by both, have not only annihilated many independent states in Europe, but have extended their menace to Atlantic in the West and Asia in the East. The enemy is almost at our door and it is only an all-out effort that can save us from the most ruthless brutality in history.

Effect of War on Agriculture. The European war has surely rebounded on the agricultural economy of India as of other countries. Under the stress of war conditions all industries are bound to suffer except those concerned with war. Due to want of shipping space, exportable commodities have received a serious set back. With the closure of the continental markets for groundnut, the most important money crop next to cotton for the poor ryot in precarious tracts, the export trade in this commodity suffered and created a situation unprecedented in the annals of the industry. Faced with the prospect of a large surplus and the consequent slump in prices to uneconomic levels, it was thought prudent to restrict the area of cultivation. Apart from this proposal, Government is bestowing its attention on storage of surplus by some agency, increased internal consumption and alternative uses for nut and oil. Increased crushing of the oil seed in our own country and utilising the oil and oilcake is an urgent problem. Oil could be utilised for various industrial products now being imported from outside such as vegetable ghee, lubricating oils, etc. The cake is a valuable and cheap organic nitrogenous manure well recognised in S. India as manure for such crops as Paddy and Sugarcane. As a cattle feed groundnut-cake is excellent for our impoverished work and milk stock as well. Intensive propaganda on all these aspects of utilising the produce in the country is now being done. Other agricultural products that suffer from surplus stocks are sugar, coffee and jute. The Coffee Market Ordinance passed recently with provisions for the control of production and pooling of surplus, may relieve the situation.

Madras Debt Relief Act Upheld: The Madras Debt Relief Act whose validity was questioned before the Federal Court in the form of an appeal, was upheld by

the learned Judges much to the relief of the small agriculturists of the province who are suffering from chronic indebtedness.

Imperial Council of Agricultural Research: It is a matter for great satisfaction that the finances of the Imperial Council of Agricultural Research have been placed on a sure foundation by the imposition of a cess on exported agricultural produce which in future will finance the Council. This is believed to relieve the anxiety of the council regarding its finance, and with better stability it will be able to function in a wider and better sphere to the great benefit of the provinces than hitherto. We are glad that the research schemes in oil seeds and animal nutrition in our province have been extended.

Report of the Committee on Co-operation:—The report of the Vijayaraghavachari Committee has been issued during the year. It is compendious and comprehensive and its recommendations are far reaching. It tackles the agricultural marketing aspect and one of its recommendations is to transfer the marketing section from the Agricultural Department to the Co-operative. In this connection we beg to point out that agricultural production and marketing go together. Agricultural officers who are well versed with production and produce will be able to function better in marketing than others. This is in conformity with the suggestion of the Agricultural Marketing Adviser to the Government of India not to circumscribe the activities of the marketing section within the limited sphere of the Co-operative Department.

Reorganization of the Agricultural Department. It is a matter of great satisfaction that the Government have sanctioned one District Agricultural Officer for each district for efficient guidance and control of the propaganda. But it is regrettable that this development was carried out by retrenching some posts of Deputy Directors and Demonstrators. We hope ere long all the retrenched posts will be restored.

Co-ordination between the Activities of the Revenue and Agricultural Departments. The proposal for co-ordination between the several departments concerned with the ryots has been before the Government of Madras for a long time and we are glad that orders have been issued recently indicating the lines of co-operation between the Revenue and the Agricultural Officers. We hope the order will be implemented by both the departments in a true spirit of co-operation to the ultimate benefit of the agriculturists of this province.

Refresher Course for Propaganda Officers. The Government of Madras have accepted the proposal of the Director of Agriculture for holding a refresher course for Agricultural Demonstrators lasting for a month at the Agricultural College and Research Institute, Coimbatore. Several improvements in scientific agriculture are developing from time to time and the propaganda officers in the districts have little chance to get acquainted with these. The refresher course with a well arranged and comprehensive programme will no doubt keep them abreast of the times.

Fruits. The Punjab with only about 62,008 acres under fruit has a well established fruit section attached to the Agricultural Department, while Madras with 420,000 acres (nearly seven times that of the Punjab) has commenced its work on fruits only in 1935. In both quality and quantity there is much lee way to be made in fruit production and we hope this conference which is going to discuss the subject of "Fruit Culture" in a symposium will give the lead and draw the attention of the public and the Government to this important problem.

College Day and Conference 1940. The celebration of the College Day and the organisation of an Agricultural Conference is one of the main activities of

the Union. The Twenty-ninth College Day and Conference was celebrated last year from the 13th to 17th July. Mr. S. V. Ramamurthi, M. A., I. C. S., then Member of the Board of Revenue, Madras, presided over the Conference. A symposium on soil erosion was organised for the conference, in which many prominent workers in the field, official and non-official, participated. Besides contributions from the departmental officers, contributions were also received from the representatives of the Forest Department, Co-operative Department and the S. Indian Tea and Coffee industries. Papers covering a wide range of agricultural subjects were presented for the second session of the conference. Though devoid of the usual side-shows associated with the conference, such as an agricultural exhibition and a Departmental Conference of Gazetted Officers, the conference concluded very successfully. Details of the conference proceedings have appeared in the 1940 July number of the Madras Agricultural Journal.

The Madras Agricultural Journal. Besides celebrating the College Day and conducting the Agricultural Conference, the all-the-year round activity of the Union is the publication of the Madras Agricultural Journal. We are glad to record that the Journal continued to maintain the high standard associated with it.

We are also proud to note that research workers in departments and institutions outside our presidency have come to feel that our journal has a place among the scientific journals of the world and are seeking its aid for the publications of the results of research. It has on its exchange list a wide range of publications from several foreign countries both in the East and West. The importance of the journal can be easily realised when we say that the Department of Agriculture, California, requested our journals to be reserved for them till the times return to normal, lest they should be lost in transit.

Our New Patrons. Sri Rao Bahadur K. T. Alwa, retired Headquarters Deputy Director of Agriculture, who has been a member of the Union since its inception, has graciously become a patron of our Union during the year. We take this opportunity to convey to him our grate-fulness for this tangible proof of his interest in the welfare of the Union.

Honours. We are glad to note that Sir C. P. Ramaswami Ayyar, Dewan of Travancore and a patron of the Madras Agricultural Students' Union was awarded the K. C. S. I. and that the title of Rao Bahadur was conferred on Sri. K. T. Alwa, before his retirement as Head-quarters Deputy Director of Agriculture. We offer our congratulations to these gentlemen on their well merited distinctions.

Our Members. It gives us great pleasure to know that the Andhra University has conferred the honorary degree of Doctor of Science on Rao Bahadur T. S. Venkataraman, C. I. E., Sugarcane expert and a member of the Union, in recognition of his epoch making researches in Sugarcane. We offer our congratulations to the Doctor on his well merited honour. We are glad to learn that Rao Bahadur M. R. Ramaswami Sivan, retired Principal of the Agricultural College, Coimbatore, was appointed as the Director of the Agricultural Institute, Anand (Gujarat). It is a fitting choice and we offer our felicitations to the Rao Bahadur and wish him a long and useful career at Anand. Dr. T. V. Ramakrishna Ayyar, retired Government Entomologist, Coimbatore, has been appointed Entomologist, Hyderabad State. We hope that Dr. Ayyar with his long and versatile experience in the Madras Agricultural Department will be an asset to the State. We wish him all success in his new sphere of activity. Mr. M. B. V. Narasinga Rao, Assistant in the Paddy Section has been appointed as Temporary Assistant for a period of 18 months under the Imperial Council of

Agricultural Research in connection with the scheme for the preparation of a monograph on "Rice breeding and genetics in India". Mr. P. Abraham, Assistant in the Cotton Section, has been permitted to enter foreign service as Scientific Officer to Bombay-Burma Plantations Ltd. We are also glad to know that C. Jagannatha Rao, Gazetted Assistant, Mungari Cotton Scheme, has been selected for appointment as Agricultural Officer in Coorg. We offer these gentlemen our congratulations.

Agricultural Graduates. It is with deep concern we view the increasing number of the unemployed graduates of the Agricultural College. In spite of the reorganisation more posts could not be created for absorption. The graduates are not wanted by other departments of the Government even though they are eminently fit for many services in the Revenue, Co-operative, Registration, Panchayat and Education Departments. We hope the Director of Agriculture will press their case.

Retirement. Since our last report Sri. Rao Bahadur K. T. Alwa, Headquarters Deputy Director of Agriculture retired from service. He was one of the founder members of the Madras Agricultural Students' Union inaugurated in 1911, and has ever been a devoted member. Besides being a joint Secretary in the first year of its inception, he held office in the Union as executive committee member, Sub-Editor of the Journal and Moffusil Vice-President. We are grateful to Rao Bahadur K. T. Alwa for perpetuating his connection with the union by becoming one of its Patrons. Mr. K. Unnikrishna Menon, Deputy Director of Agriculture and Senior Lecturer in Agriculture and Superintendent, Central Farm, has proceeded on leave preparatory to retirement from service. He was also associated with the Union for a long time. He was resident Vice-President, Moffusil Vice-President and also the Sub-Editor of the Journal. We wish them both long and peaceful life.

Obituary. We record with regret the passing away of Sri. M. Sambanda Mudaliar, B. A., B. L., Advocate, Coimbatore and a Patron of the Madras Agricultural Students' Union. Sri. T. V. Narayana Rao, Retired Farm Office Manager, passed away during the year at the ripe age of seventy-one. Sri. T. A. Rangaswami Iyyengar, K. Rajabapanniah, P. Parthasarathy and V. Panduranga Rao, all members of the Union, prematurely passed away during the year. We take this opportunity to convey our condolences to the members of the bereaved families.

Acknowledgements. It is now our pleasant duty to record our thanks to all those who have helped the Union during the year. To Sri. S. V. Ramamurthi, M. A., I. C. S., the Union owes a deep debt of gratitude for presiding over the College Day and Conference last year. To the various contributors of papers who participated in the symposium on soil erosion last year, we tender our sincere thanks. To Mrs. K. M. Unnithan, who distributed the prizes for the sports, we record our grateful thanks. To Mr. Westlake, I. C. S., the then Director of Agriculture, who took keen interest in the affairs of the Union, for the invaluable help rendered in arranging for the conference last year and for the special interest he took in the Madras Agricultural Journal, the committee tender their heartfelt thanks. We are also very grateful to Mr. P. H. Rama Reddy, our present Director of Agriculture, for his continued interest in the affairs of the Union. To Mr. R. C. Broadfoot who, as president, has always actively helped the Union in its various activities we tender our grateful thanks. Our grateful thanks are also due to all other ladies and gentlemen who in various capacities have helped the Union in the celebration of the College Day and Conference last year as well as in its day to day activities during the year.

Presidential Address

By Dr. C. R. REDDY, M. A., (Cantab), D. Litt., M. L. C.,
Vice-Chancellor, Andhra University, Waltair.

Ladies and Gentlemen,

It gives me no small amount of pleasure to have accepted the invitation of the Madras Agricultural Students' Union and to be present here to preside over the College Day and Conference this afternoon. Let me first congratulate the Agricultural College which has been functioning so well and has become world famous by its researches. I have to congratulate in special Mr. T. S. Venkataraman who by his experiments has been able to make the world sweeter by lowering the cost of production of sugarcane many times below what it used to be 25 years ago. I am glad that all of you in the college have approved the action of the Andhra University in having passed a resolution to confer the highest honorary degree in science on Mr. Venkataraman. The Andhra University had from the beginning followed the principle and policy of recognising Indian merit. I feel that it is a duty cast on our universities to recognise wherever it is, knowing that we have not so far suffered from over-generosity in the conferment of degrees. If we do not honour our own men who else would ?

Mr. S. V. Ramamurthi, Chief Secretary to Government, who presided over the College Day and Conference last year gave a very learned discourse on problems relating to agriculture which was full of mathematical ratios. I, for my part wish to view from the layman's point the subject of agriculture in the economy of India. I agree with Mr. Ramamurthi in thinking that agro-industry should solve the problem of poverty in our country. Our country is terribly poor. Most of the people do not live, they simply exist. Philosophers used to tell that we are creatures between life and death, but the fact is we are nearer death. There are two things which I wish to suggest as a remedy. The first is an economico-political situation namely the establishment of colonies. European nations under pressure of population expanded over Canada, the Western Hemisphere, Australia, Africa and other countries. This resource is not open to Indians for various reasons. Of course our people have gone to Burma, Ceylon, South Africa and Guiana, but not as colonists in the full sense of the term. At best they are labourers, not even settlers. They do not enjoy the rights of the colonists or the right to hold real property. Restrictions are placed on their right to trade, to dwell in municipalities and on their freedom, economic and civic. After the great war hopes were held out that, in recognition of the part played by India in support of the allies, they would be allowed not a monopoly but at any rate an unfettered right to migrate on terms of full citizenship to places in Africa, like Kenya. You know what happened. The cool heights and plains of Kenya were reserved for Europeans and Indians were excluded there from. It strikes me that while we declaim the horrid bitter racialism for which Nazi Germany stands, it cannot by any means be

said that racialism is altogether absent from the other dominating peoples of the world. I would like to see the British Commonwealth of Nations a real Commonwealth with no white Australian Policy or white South African Policy to vitiate the conception of equal rights and equal sacrifices which must always go together. But I know as a student of history these ethical reforms instilling human equality and human oneness cannot be achieved for the asking or realised. We must have patience. As things are, we have not been able to secure a satisfactory solution of the Indian problem in Burma and in Ceylon. We, Hindus, cannot afford to throw stones while we ourselves have lived in glass houses for generations. In spite of the Vedantic doctrine that all souls are equal and that they have emanated from one God inequality is there, invidious and deplorable, and not merely accidental but the essence of our social order. We should set an example of the equality which we ask for, and recognise that it would require time and moral evolution to bring about the desired result.

The second remedy I wish to put forth before you is intensive cultivation. Before I deal with it, I wish to refer to the proposition once advanced that India should remain a raw material producing country and need not get industrialised. Mr. J. M. Keynes, the distinguished economist, held that all raw material producing concerns worked under the law of diminishing returns. Arguing so, Mr. Keynes was of opinion that India being an agricultural country, the value of her products would go up, that it would ultimately benefit India were she to remain a raw material producing country and allow European countries to manufacture goods, maintaining thus a division of labour between Europe and India. But like most economists he assumed several conditions, such as, peace in the world, free trade and free exchange. But you know that none of these conditions are fulfilled. It is now clear that peace with European nations meant a period of preparation for war. The situation today belies the theory of the economists. The idea that we could export our raw surplus has to be abandoned. The value of the produce which depends on the foreign market has fallen. Further more, there are no ships to export. And if there are ships to export there is no guarantee that they would reach the other end. Government are trying to regulate the supplies. The other remedy is the development of manufactures. Had the Government the prudence to have done so before, we would be not only helping ourselves but also the Empire at this moment in a greater measure. This appears to work in a vicious circle. We could not get the machines or tools. At best these would be had only on a small scale. On the whole, it is sad to contemplate that the Government's policy had been in peace time no need, and in war time not possible.

Intensive agriculture is a thing with which the College has been closely associated from its inception. I am very glad to see the exceedingly good work that the College has been doing. It is not merely in sugar, but in respect of paddy, of groundnuts and in many other ways it has helped agriculture a great deal. A distinguished friend of mine felt rather

dis-appointed that the scientific methods of agriculture taught here were not so widely known as to be adopted by the ryots. I am not able to say who is responsible for this defect. If the Director of Agriculture could remedy this defect I am perfectly sure he would do so. But there are other factors. The ryots are too poor to adopt new methods even though these meant more profit to them. The initial expenditure stands in the way. And this defect is greater under the Hindu law, which led to fragmentation of holdings. In Japan, fragmentation was once prevalent to such an extent that bunds covered a good portion of the fields. But it was remedied by a law for consolidation. Some such remedy is needed in India. The Government and the people must move quickly. During war time there may be difficulties, but an attempt has to be made. Meanwhile there is an awakening and the silver lining of the war is seen in its effect in promoting industries and agricultural production. Government and people must work together and whole-heartedly to achieve the desired end.

I now come to the problem of unemployment among agricultural graduates, and let me urge that agricultural graduates should set an example in self-reliance. In America and Canada a system of rural education has been evolved which imbued the young men and women with a spirit of learning agricultural and domestic science. Perhaps, an adaptation of some such method, I believe, might be more expedient here than trying to produce all the teachers necessary for the elementary schools from an institution like this College. The primary function of the College should be to keep up its research work. Coimbatore is an ideal centre for starting paying industrial enterprises in co-ordination with agriculture.

Whatever be our quarrels, let us remember our tie with the British people for the past 250 years and during this period of war, it is our duty to support them. It is certainly better to build up on existing conditions than to invite a complete smash up with all its horrors. Even before the outbreak of the war, I had felt that the country was not in a fit condition for transference of power. Communalism had grown to such dimensions that it threatened the very integrity of India. There is a division and we could not come to an agreement even during the present moment. Our duty is very clear, especially after Hitler's invasion of Russia. It is impossible for any power to come to an agreement with Hitler as he would not keep his word if anything lay within his mailed fist. In the glare of that venomous animal all things nearby got frozen into inactivity, waiting to be devoured by him. We are not fortunately near it, nor are we so far away as to feel safe. Some think that the war is threatening India now, but the deeper view according to me is, the war is already over the entire world. India is already in it. I felt so even when the war broke out. The real purpose of Hitler is to establish a new order, and it has nothing to do with the Treaty of Versailles or anything of that kind. The central conception of his new order is that all the world should be under the domination of Nazi Germany and dependent on her.

For the first time, I shall reveal now one thing which I did in 1939. I wrote to the authorities that when they won the war, at least the Italian portion of Africa should be given over to India. War means always waste and it should speedily be replaced. Production should be therefore raised to the maximum. We could thus help Britain in the war so that the legitimate freedom of the people in the world and national rights might be established. We should help Britain to strike back with such force that Nazi Germany would not resist.

List of Prize Winners.

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| 1. The Robertson Prize (the premier prize of the college, for Agriculture in the Final Examination) | V. R. Rajagopalan |
| 2. The Clogstoun Prize (for general proficiency in the college terminal examination) | N. Srinivasulu. |
| 3. The Kees Prize (for Agricultural Chemistry) | B. Narasimham. |
| 4. The Sampson Memorial Prize (for Agricultural Botany) | G. Rama Rao. |
| 5. The Dewan Bahadur R. Raghunatha Rao Prize (for Practical Agriculture, final examination) | P. Venkateswara Rao |
| 6. The D'Silva Memorial Prize (for Animal Hygiene) | C. Sankara Rao. |
| 7. The Goschen Prize (for Agricultural Zoology) | K. Rammohan Rao. |
| 8. The Anstead Prize (for plot cultivation) | V. Mahimai Doss. |
| 9. The Rao Bahadur K. S. Venkatarama Ayyar Prize (for best student in the first examination) | C. Krishnamurthi. |
| 10. The L. D. Swamikannu Memorial Prize (for the highest total marks in all the three University examinations) | G. Rama Rao. |
| 11. The Certificate Course Cup (for Agriculture in second examination) | A. Adivi Reddy. |
| 12. The Old Cuddapah District Agricultural Association prize (best student from the Ceded Districts) | } Mirza Anser Baig, I year.
} C. Sankara Rao, II year.
} N. Bhaskara Reddy, III year. |
| 13. The Gupta Prize (for Agricultural Engineering) | K. Rammohan Rao. |
| 14. The M. K. Nambiar Memorial Prize (for the highest total marks in the second examination) | } A. Adivi Reddy and
} C. Sankara Rao. |

Papers.

Symposium on Fruit Culture.

1. Some noteworthy features of fruit industry in the Rajampet Taluq—
T. K. Viswanathan.
2. Culture of Kodur oranges—*M. Mohan Rao.*
3. Cropping behaviour in mangoes—*K. C. Naick & M. Mohan Rao.*
4. A few observations on polyembryonic mangoes in the West Coast—
E. K. G. Nambiar.

5. Our present position with regard to the control of fruit pests—
M. C. Cherian,
6. Fruit nursery practices—*V. Venkatadri Reddi and R. S. Sundaram.*
7. Nagari oranges, their past and present—*A. Muhamad Ali.*
8. Fruits as food—*Rao Sahib G. Jogi Raju.*
9. Some fruit diseases in relation to horticultural practices
and mineral deficiencies—*D. Narayana Rao.*
10. Some promising fruit products of South India—
R. S. Sundaram and D. Krishnaswami Naidu.

Chairman's Concluding Remarks.

Gentlemen,

I am sure you will all agree that we had a very successful conference. It is really unfortunate that Dr. C. R. Reddi could not stay for the entire proceedings. It is a great thing that in spite of his indifferent health he was able to go over here to give us his very valuable presidential address. The Madras Agricultural Students' Union has to be congratulated on the selection of a very important subject like Fruit Culture, which is of tremendous importance to the country. The fruit industry is not a new thing to us. It is one of the oldest in India, but unfortunately most of the orchards are in a neglected condition. The Government is alert to the situation and a Fruit Specialist is to be appointed in the very near future. What is more, Demonstrators are already being trained in Horticulture at the Fruit Research Station, Koduru, and they have to give the fruit growers all adequate help in promoting this industry. There is no danger of over-production of fruits in such a vast country as ours. In the past it might be, garden owners were getting very high income, and it is just possible due to increase of orchards income is going down; but I am sure the income will never reach an un-economic level. From the consumers' point of view reduction of the price of fruits is certainly necessary, especially when we know that fruits are desirable for invalids, children and old people. Cold storage, which is an essential factor, has to be developed. In connection with insecticides which form an important feature of this industry, I am glad the Entomologist is carrying on research work on indigenous insecticides. For, you know we are importing a great deal, and it is always best we stand on our own legs. Before I finish, I appeal to the Departmental Officers to carry on the work of demonstration and propaganda in co-operation with the Revenue Department to the great benefit of the ryots of the Province. It is my wish that this work must be carried on with all the zeal and sincerity of a missionary.

College Day Entertainment.

The College Day entertainment which came off on the 10th instant was of the usual standard of excellence. The Students put on boards a piece in English, a small farce in Telugu and a romantic play in Tamil intercepted with comic interludes, in which Mr. C. S. R. Jaratnam took a prominent part. The scenic arrangements were good and all the actors acquitted themselves very well

indeed ; but special mention must be made of the contribution of Mr. T. Chellappa (English), Mr. C. Ramakanta Reddy (Telugu), and Mr. V. Mahimai Doss (Tamil). These three deservedly in our opinion won the medals instituted by the entertainment committee for the best actor in each piece. Mr. P. H. Rama Reddi, Mr. R. C. Broadfoot and Mrs. W. V. Ramiah acted as judges.

College Day Athletic Sports 1941.

The annual athletic sports in connection with the College Day and Conference this year was as usual conducted by the Madras Agricultural Students' Union at 3 P. M. on Saturday, 12-7-41. The S. W. monsoon, which year after year threatens but never mars the successful conduct of this much looked for function, was true to its tradition this year also, and cleared up in time on the 12th afternoon, though it had been raining incessantly since the 7th of July, and had even registered a fall of 8 cents on the forenoon of the sports day. Our thanks are due to Mr. H. Shiva Rao, the indefatigable Vice-President of the Students' Club, and his band of voluntary workers who in spite of the weather had had the ground marked and ready for the sports meet.

As a result of the change-over last year to the metric system in the track events all previous records of the college got effaced and the performances last year stood as records for this year. Of these four items in the track events have been bettered this year and in four field events, viz. Pole vault, Hop, step and jump, Javelin throw and Shot put, new records have been set up this year. The championship cup for the year was won by C. V. Govindaswami. An interesting feature of this year's sports meet was the mike and amplifier arrangement hired out from the local Municipality, which enabled announcement to the spectators every detail of the sports events as they were proceeded with, while providing enchanting music in between.

The members of the Madras Agricultural Students' Union were "at home" to the guests assembled at the sports meet. The tea arrangements were ably and well conducted by Mrs. C. M. John and members of the tea committee, to whom the thanks of the Union are immeasurably due.

At 6 P. M. sharp, as per schedule, the sports came to an end. Mr. R. C. Broadfoot, the Principal of the College, congratulated the prize winners, and requested Mrs. Imamuddin, wife of the local District Munsiff, to give away the prizes, who very kindly did so. The president of the sports committee, Mr. A. M. Kulandai then proposed a vote of thanks and the function came to a close. We are very much indebted to the gentlemen, both official and non-official, who very kindly helped us on the sports day as judges, referees and in other capacities. To them in no small measure is due the successful termination of the day's function.

List of Prize Winners.

Cross Country Race (5 miles). (The Norris Cup.) 1. R. M. Sastry. 2. V. Mahimai Doss 3. B. S. Krishnan. Time 43 min. 27 $\frac{2}{5}$ secs.

Pole Vault. 1. T. Chellappa. 2. C. R. Tiruvengadam. New Record—8 ft.

110 Metres Hurdles. (The Ramaswami Sivan Cup.) 1. I. L. Narasimha Rao. 2. C. V. Govindaswami. 3. S. Krishnaswami. New Record—19 $\frac{2}{5}$ secs.

Shot Put. (16 lbs.) 1. V. D. Kamath. 2. J. P. Nageswara Rao. 3. B. S. Krishnan. New Record—30 ft.

100 Metres Dash. (The Saidapet Old Boys' Cup.) 1. I. L. Narasimha Rao 2. C. V. Govindaswami. 3. R. M. Sastri, New Record—12 $\frac{1}{5}$ sec.

Long Jump. 1. C. V. Govindaswami. 2. J. Subramaniam. 3. I. L. Narasimha Rao. Distance;— 17 ft. 1½ in.

Cricket Ball Throw. 1. M. Ch. Kavulatlayya. 2. A. Radhakrishnan. 3. T. Chellappa. Distance—228 ft. 11 5/8 in.

200 Metres Hurdles. 1. C. V. Govindaswami. 2. I. L. Narasimha Rao. New Record—32 1/5 sec.

High Jump. (The Tadulingam Cup). 1. S. Krishnamurthi Rao. 2. C. Ramakantha Reddy. 3. I. L. Narasimha Rao. Height—4' 8".

Invitation Race. (800 Metres). 1. L. Veranān, Central Recruit School. R. D. 1006. 2. A. Ramaswami, Union High School. Time. 2 min. 16 1/5 sec.

Hop, Step & Jump. 1. I. L. Narasimha Rao. 2. C. V. Govindaswami. 3. S. Krishnaswami. Distance—36 ft. 5½ in.

400 Metres Race. 1. C. V. Govindaswami. 2. I. L. Narasimha Rao. 3. Ganeshan. Time—60 3/5 sec.

Javelin Throw. 1. V. D. Kamath. 2. B. S. Krishnan. 3. N. R. Adyantaya. New Record—113 ft. 11 in.

1,500 Metres Race. 1. R. M. Sastry. 2. B. S. Krishnan. 3. V. Mahimai Doss. New Record—5 min. 42 3/5 sec.

Old Boys' Race. (Handicap). 1. M. Mukundan. 2. D. Sundararaj. 3. S. Varadarajan. Time:— 13 1/5 sec.

4x 400 Metres Relay Race. (Intertutorial) (The Chunampet Shield). 1. Mr. C. M. John's wards. 2. Mr. K. M. Thoma's wards. Time 4 min. 51 3/5 sec.

Tug of War. (Intertutorial) (The Ramnad Shield). 1. C. R. Srinivasa Ayyangar's wards.

Champion of the year 1941. C. V. Govindaswami—24 points.

Report of the Managing Committee for the year 1940—41.

(Presented to the General Body)

The Managing Committee beg to present the following report of the activities of the Union for the year 1940—41.

Membership. The strength of the Union as it stood on 31st May 1941 was 496 as against 503 of last year and 450 year before last. In spite of this large membership still a large percentage (over 40%) are outside the Union. Despite appeals sent to many officers and subordinates, not more than 4 or 5 officers became members. In this connection our thanks are due to Mr. K. C. Naik for taking interest and being responsible for enlisting the above number. We take this opportunity to appeal to all officers who are not members already to enlist themselves as members and also help the Union in enlisting members in the future. We would also request the students who pass out of the College to continue their membership as they have the benefit of the concessional rate of membership until they are employed.

Office Bearers. Mr. R. C. Broadfoot, our President proceeded on long leave due to ill health but we are very glad he returned after an absence of 10 months in better health. During his absence Rao Bahadur G. N. Rangaswami Ayyangar acted as President. Consequent on the resignation of Mr. P. V. Ramiah, who was elected Vice-President at the last general body meeting, Sri. C. R. Sreenivasa Ayyangar was elected as Vice-President by the resident members.

General Body Meeting. Two general body meetings of the resident members were held on 2—9—40 and 6—3—41. The first meeting was for the election of Vice-President. The other, under the presidency of Rao Bahadur G. N. Rangaswami Ayyangar, was for the consideration of a letter from Sri, N. Balakrishnan

(an ex-student of the College) setting forth the grievances of the unemployed agricultural graduates. The president explained at length what he as Principal had done for furthering the cause of the unemployed students of the College before and after the receipt of the letter from Mr. N. Balakrishnan. He said that possibly the Director of Agriculture had already addressed the Government regarding the employment of agricultural graduates in Departments other than Agriculture and that it would be premature to take further steps till the decision of the Government is known. It was also felt at the meeting that it was necessary to bring to the notice of the heads of other Departments regarding the special aptitude of the B. Sc. Ag. degree holders for services in their Departments. At this meeting it was also resolved to approach the Government for a subvention of Rs. 600 to the Union for enlarging the scope and increasing the utility of the Madras Agricultural Journal as a medium of educative propaganda in agricultural matters pertaining to the Province.

Meetings of the Managing Committee. Nine meetings of the committee were held during the year.

The Madras Agricultural Journal. The journal continued to be published with promptness and regularity during the year. A good number of articles were available for publication and we take great pleasure in recording our thanks to the several authors who have contributed to the success of the journal. We feel the paucity of contributions of general agricultural interest and we appeal to district officers for such. The students' annual supplement to the Madras Agricultural Journal was published along with the April issue of 1941. We record our appreciation of the promptness of our printers, The Scholar Press, Palghat.

Editorial Board. Thirteen meetings of the Editorial Board were held during the year. Consequent on the resignation of Mr. M. Kantiraj, Sri C. S. Krishnaswami was co-opted as a member of the editorial board. We have great pleasure in recording our thanks to Mr. K. M. Thomas, Editor and to the other members of the editorial board for the able and efficient conduct of the journal during the year.

Subscribers. The number of non-member subscribers to the journal during the year was 211 as against 215 of last year and 230 in the previous year. We appeal to the moffusil members to enlist more subscribers and to make the journal more popular in the Presidency.

Exchange List. Thirty-six journals (Indian and Foreign) were on the exchange list during the year as against 32 of last year.

Finance. The auditors' report and the financial statements are now placed before you. (copy enclosed as a supplement to this issue). Our finances have maintained fair progress despite a drop in receipts under donations and entertainments for the College Day which were far below expectations. There is also a fall in subscriptions to the journal due to arrears. We appeal to the members resident and moffusil, to be prompt in the payment of their subscriptions.

War Fund. In accordance with the resolution passed by the general body last year, a sum of Rs. 25 was subscribed to His Excellency the Governor's war fund for Indian defence purposes.

Extension to the Union Buildings. Last year the general body voted an amount of Rs. 800 for expenditure for extension of the Union buildings. The estimate prepared had to be revised and enhanced in accordance with the suggestions of the Public Works Department. An amount of Rs. 1000 is provided in the budget estimates for 1941-42 for this purpose and we hope the general body will sanction this amount.

Ramasastrulu Munagala Prize. In accordance with the decision arrived at the meeting of the general body held last year to open the competition for papers on economic enquiry in one year and for research in another, the managing committee invited papers on economic enquiries this year. Four papers were received. The judges considered the paper on the Economic survey of the Anakapalle Jaggery market by Sri. A. Sankaram as the best and recommended the award of the prize for it. We take this opportunity to congratulate Mr. Sankaram. Our thanks are due to Dr. B. V. Narayanaswami Naidu, Chairman of the committee, Rao Sahib G. Jogiraju and Mr. M. Kantiraj for judging the papers.

Acknowledgements. Now it is our pleasant duty to thank the various members of the Union who helped and co-operated with its activities during the year. We have great pleasure in recording our grateful thanks to the conveners and members of various sub-committees who had whole heartedly helped us in the celebration of the College Day and Conference last year. Our thanks are due to Mr. J. H. Longrigg, Principal of the Forest College, for loaning us tents and chairs last year. We are specially thankful to Mr. & Mrs. Cherian for arranging tea for the visitors on the sports day last year and to Mr. K. M. Thomas for conducting the sports successfully. We are grateful to Sri. Rao Bahadur G. N. Rangaswami Ayyangar who acted as President for over 9 months for his keen interest, active help and guidance in the affairs of the Union. Finally, the Union is greatly indebted to Mr. R. C. Broadfoot, Principal and President of the Union who has always been kind and sympathetic and ever ready to help and guide the Union in managing its affairs.

The Annual General Body Meeting, 1941.

The annual general body meeting of the Madras Agricultural Students' Union was held on Sunday, the 13th July 1941, with Mr. R. C. Broadfoot, President of the Union, in the chair. Eighty-six members were present.

The minutes of the previous meeting were read and adopted. The annual report including the statement of accounts for the year 1940-41 and budget for 1941-42 was then presented by the Secretary.

Next Mr. K. M. Thomas appealed to the members to try to increase the membership in order to improve the Journal further, even though it is self supporting at present. More subscribers are required to improve the finance and with improved finance only the Journal can keep pace, with such a rival as the Indian Farming.

Mr. M. Balakrishnan Nair proposed that the subscription may be reduced to Rs. 2 for officers drawing less than Rs. 50. The president pointed out that it is better brought as a resolution with previous notice and so the proposal was dropped.

The budget for the year 1941-42 was then passed subject to the explanation of the discrepancy pointed out by Mr. P. S. Narayanaswami between the amount of miscellaneous receipts and miscellaneous incomes on pages 3 and 4 of the statement of accounts.

The following office bearers were then elected for 1941-42.

Vice-President :—Sri. C. R. Srinivasa Ayyangar.

Editor :—Sri. S. N. Chandrasekhara Ayyar.

Secretary :—Sri. V. Gomathinayagam Pillai.

Mofussil Vice-Presidents :—Sri. R. Swami Rao, Dr. A. Subba Rao, Sri. K. C. Naik.

Mofussil members for the Council :—Sri. A. Sriraman, Sri. K. Raman Menon, Sri. C. Venkatachalam, Sri. M. Rami Reddi.

President members for the Council:—Sri. K. Raghavachari, Rao Sahib V. Muthuswami Iyer, Sri. T. V. Reddi and P. K. Sivasubramanyam (Student).

Manager:—Sri. M. A. Sankara Ayyar.

Treasurer:—Sri. M. S. Purnalingam Pillai.

Members of the Managing Committee:—Sri S. V. Doraiswami Iyer, Sri. T. Nataraj, C. Balasubramaniam and K. V. S. Suryanarayanamurti (Student).

Editorial Board:—Sri. K. M. Thomas, C. M. John, C. S. Krishnaswami and C. L. Sundararajan (Student).

In winding up the proceedings the President, Mr. R. C. Broadfoot, thanked all the members of the Union and the members of the various committees for the successful conduct of the College Day and Conference. He also suggested that in asking Government for subvention for the Journal the necessity for increasing the number of pages for inclusion of more popular articles may be emphasised. Sri C. R. Srinivasa Ayyangar then proposed a hearty vote of thanks to Mr. R. C. Broadfoot for evincing keen interest in the affairs of the Union.

An Economic Survey of the Anakapalle Jaggery Market*

By A. SANKARAM, B. Sc. Ag.,

Madras Agricultural Department.

Introduction. Among the manufactured products of sugarcane, jaggery takes the first place. Its consumption is about two to two and a half times that of white sugar (both indigenous and imported). This shows that jaggery making as a cottage industry is very important in Indian rural economy. In recent years, it has been observed that the cane cultivator is an adept in the art of jaggery manufacture but is uncertain of his legitimate returns owing to the several disabilities he is suffering from, such as chronic indebtedness, want of ready money to meet cultivation charges, high rates of interest charged by money lenders, etc. Besides the wide and unsteady prices for jaggery, the existence of a host of middlemen in jaggery trade, the chaotic system of weights and above all want of properly organised marketing facilities makes jaggery making, as a cottage industry, a risky proposition.

With a view to study the present system of marketing and to find out the possibilities of improvement in the same, an enquiry was carried out at the Anakapalle jaggery market. With the limited facilities available to the author the enquiry was confined to this one important trade centre and the results are presented in this paper.

Area under sugarcane. Sugarcane is an important money crop in the Vizagapatam district and the largest areas are concentrated in Veeravalli, Anakapalle and Sarvasidhi taluks. The Vizagapatam district ranks first in sugarcane area in the Presidency of Madras, Veeravalli taluk taking the first place with an area of 10,000 acres and Anakapalle and Sarvasidhi taluks closely following with 4000 and 1500 acres respectively.

Methods of cane disposal. Out of the total amount of cane produced in the three taluks about 8 to 10 per cent is estimated to go towards seed

* Ramasastrulu—Munagala Prize essay, 1941.

material, 5 to 6 per cent is consumed by the factory at Thummapala and the rest converted into jaggery. The cane used for chewing is a negligible percentage.

Jaggery season. The jaggery season commences with the beginning of December and usually extends to May. The peak transactions in this commodity usually take place during February and March. Ryots from certain villages like Chuchukonda and Ganaparti sell their jaggery during the months of October and November. Thus practically throughout the whole year jaggery will be coming to the market but an active period may be said to last from January to March.

Methods of transport. Ryots within easy reach of the market (within five miles) send the jaggery prepared on the previous day to the market the next day, and women coolies usually bring the jaggery in baskets. Each woman can carry two moulds or one slab. Ryots situated beyond five miles distance engage a cart for transport. Each cart can carry 50 to 60 maunds (1 maund = $22\frac{1}{2}$ lb.) Recently it has been a practice for a group of ryots (8 to 10) to engage a cart on a co-operative basis to send their produce every day to the market.

Market and traders. Anakapalle has been well known as a place from which large quantities of jaggery are exported every year to other Provinces and the States. There is a big jaggery market in the heart of the town. The principal dealers in this trade are the big individual merchants of Anakapalle. Besides these merchants there is at present a Co-operative Loan and Sale Society, which shares a fairly appreciable part of the trade. Supplies of the commodity are made by the ryots in the neighbourhood for sale in the market. Ordinarily the wholesale merchants do not store the commodity for any considerable length of time in their godowns, but try to dispose off their stocks at the earliest possible opportunity. Most of the merchants and the society are only commission agents but there are a few who actually do some speculative business by stocking the product in the hope of getting higher prices at a later date. The Society does not take any part in speculative business but disposes off the commodity received on the same day as far as possible. About a dozen merchants are engaged in the export trade.

Shapes of Jaggery. There are only three different shapes in which jaggery is cast and sold at the Anakapalle market.

1. Moulds (Tel. *Dimmalu*), cast in baskets.
2. Slabs (Tel. *Chakkilu*), cast in shallow pits lined with mats.
3. Buckets (Tel. *Balchilu*), cast in buckets.

The slabs cast in mat-lined pits are said to have particularly good market in Godavari, Kistna, Guntur and Nellore districts as well as locally. The 'moulds' and 'buckets' are reputed to be particularly liked in the markets of Northern India and Hyderabad. Each 'mould' weighs 1 to $1\frac{1}{4}$ mds., the 'slab' 3 to 4 mds. and 'bucket' 2 to $2\frac{1}{2}$ mds.

Grading. Systematic grading purely on scientific basis involving the determination of the sugar content and combined impurities is not in practice at the market. However few grades are clearly recognised and these actually govern the ruling prices for different types of jaggery coming to the market. The main factors that have a bearing on the grades are :—

1. Hardness and consistency (Tel. *Ganithamu*)
2. Crystalline structure (Tel. *Ravvakattu*)
3. Colour (Tel. *Rangu*)

Of the three, hardness is the vital factor as the keeping quality of jaggery is entirely dependent on it. This is tested by the sharp metallic sound produced by tapping the block with finger tips. Also the blunt end of a pencil when pressed against the block should not penetrate or leave any mark or impression of the impact. Granted that there is hardness, the crystalline appearance and colour determine the superiority or otherwise of the sample. Observance of a crease made on the surface of the jaggery with the aid of a penknife point will indicate its crystalline nature. The application of the above tests is utilised to differentiate the three grades of jaggery noted below :—

Grade designation.

1st grade

2nd grade

3rd grade

Definition of quality.

Hardness, crystalline appearance and creamy yellow colour.

Hardness plus any one of the other two.

All the rest of the jaggery.

It may be noted that the local market grades described above do not involve any tests for degrees of sweetness or the variety of cane from which it is prepared—all jaggeries being regarded as sweet enough. There is a small quantity of extra special type of jaggery getting into the market and it will always fetch a special price in the market. This is not to be included under any one of the three grades described. This is the jaggery that is made from B 208 at Mamidipalli. During the course of the enquiry with the Secretary of the local Co-operative Loan and Sale Society the writer came to understand that unless confidence is created in the traders for certified quality of the graded commodity the dealers would insist on testing the jaggery in accordance with their own standards for determination of the quality and ultimately to fix up the market price.

Fixation of market price. Out of the 42 shops in the market there are about 36 shops mainly engaged in jaggery business including the Co-operative Loan and Sale Society. The total quantity of jaggery that comes to each of these shops is assembled on the verandahs of each shop. Experienced coolies grade the commodity into three grades as per standards described. The market dealers go from shop to shop for bidding at the auctions. A reasonable price for the first grade of jaggery is provisionally fixed. The merchants then begin to bid over the standard price and the highest bid struck off will be the price for the first grade of jaggery for the

day. From the price thus fixed for the first grade, the price for the other two grades will accordingly be reduced and fixed. The price on a particular day depends upon the following factors, and their relative influence will be in the order mentioned :—

1. The quantity of jaggery that comes to the market.
2. The demand from merchants that come from other Provinces and States.
3. The quality of jaggery.
4. The particular shape of the jaggery.

TABLE I. Statement showing the monthly average prices of jaggery per maund (22½ lb.) at the Anakapalle market.

Month.	1935	1936	1937	1938	1939
January	1 4 10	2 10 0	0 11 2	0 11 3	1 6 2
February	1 2 7	0 14 3	0 9 8	0 12 10	1 9 6
March	1 3 5	0 13 5	0 8 4	0 14 4	1 11 1
April	1 5 7	0 12 8	0 9 6	0 15 11	1 15 9
May	1 4 9	0 10 7	0 9 7	1 3 9	2 0 9
June	1 5 4	0 10 6	0 8 0	1 3 1	2 0 2
July	1 4 6	0 11 5	0 11 2	1 5 10	1 13 10
August	1 4 5	0 11 0	0 11 0	1 8 5	1 13 0
September	1 5 9	0 11 5	0 11 2	1 7 1	1 6 1
October	1 7 0	0 13 10	0 11 5	1 11 11	2 0 0
November	1 4 8	0 15 5	0 9 7	1 9 0	1 14 9
December	1 2 5	0 12 11	0 11 4	1 8 11	1 9 5
Yearly average.	1 4 8	0 11 8	0 11 0	1 4 0	1 9 4

Price movements. A close study of the monthly average prices of jaggery per maund (22½ lb.) at the Anakapalle jaggery market from 1935 to 1939 as shown in Table I has warranted the following inferences.

1. The market generally maintains remarkable stability and steadiness in prices in the period from December to February, the fluctuations being negligible.

2. Slight fall in prices during the months of March and April indicate the relatively huge supply in comparison to the low demand. At this part of the year the market generally displays uncertainty and prices decline.

3. The slackening in supply during the period from August to October will make the prices rise to a very favourable limit and *ryots* who stored their commodity during the on season derive much profit at this time.

4. In exceptional years like 1937 the price fell as low as 8 annas per maund and *ryots* could not make both ends meet.

Trade commissions. A detailed statement of the different trade commissions charged at the Anakapalle market is shown in Table II. The average commission per maund (22½ lb.) of jaggery varies from 9 pies to 1 anna depending on the price of the jaggery. Taking the price of jaggery per maund to vary between 8 annas and Rs. 2 the commission varies from 4 to 9 per cent of the total price of the jaggery. The local market terms are duly explained under Table II.

TABLE II. Statement showing the Trade Commissions charged at the Anakapalle Jaggery Market.

Items.	Paid by seller.		Paid by buyer.		Remarks.
	Rate.	To whom paid	Rate.	To whom paid.	
Market tolls	0 2 0	Market contractor	...	...	Per cart load.
..	0 0 3	do	...	...	Per head load.
<i>Kolagaram</i>	Average co. of one vis jaggery	<i>Kalasis</i>	...	...	Per 22½ Mds.
<i>Tolai</i>	...	...	0 3 0	<i>Kalasis</i>	Per cart load of 60 mds. (including charges for services for sweeper, water carrier, etc.).
Stitching moulds and charges for twine	...	...	1 0 0	<i>Kalasis</i>	Per 100 basket moulds.
			1 8-0	..	Per 100 bucket moulds.
Commission*	0 0 9	Buyer	...	...	Per maund; (if the price of jaggery is Rs. 1-8-0 or above the commission is Re. 0-1-0 per maund.)
Weighing charges	0 0 1	<i>Kalasis</i>	...	...
<i>Vaida</i> Interest	...	...	0 0 9	Seller	Per day, for 18 days.
<i>Valtar</i>	...	...	0 8 0	..	For every Rs. 100,
<i>Chesti mudra</i>	...	...	0 0 3	..	do.

*The commission charged depends on the ruling price of jaggery per maund (22½ lbs.)

Explanation of Market terms.

1. *Market tolls.* A nominal fee charged for getting the jaggery into the market compound for sale.

2. *Kolagaram.* This is the wages paid for *kalasis* (coolies) for the labour involved in the process of unloading the carts, grading jaggery, etc.

3. *Tolai.* A small donation to meet the incidental charges for the facilities provided at the market like keeping clean water to drink.

4. *Vaida* interest. This is a kind of discount made from the amount due from the buyers to the sellers. Payment of cash for the amount of jaggery purchased would effect remission @ 9 pies per Rs. 100 per day until 18 days thereafter, after which period interest shall be calculated at the same rate for the due amount.

5. *Valtar*. This is also called "Hindu discount". In olden days when some of the important banks had not their branches established at Anakapalle it was customary to pay an additional sum of 8 as per every Rs. 100 due from the buyer to the seller (merchants at Anakapalle). This is to meet the incidental charges towards getting the cheques issued by the buyers, cashed on the banks of Vizagapatam or Vizianagaram. Now that the banks are established at Anakapalle, payment in cash is being resorted to as a result of which a sum at the said rate is being deducted from the amount due from the buyer to the seller.

6. *Chesti mudra* Whenever payments are made as cheques on banks at Anakapalle, a sum @ 3 pies for every Rs. 100 is paid in addition to the seller. This is to cover the charges of labour involved in getting those cheques cashed.

Produce Movements. The jaggery from the Anakapalle market go as far as Bihar and the United Provinces in the North, and Hyderabad and Travancore in the south. The recently laid out railway line connecting Raipur and Vizagapatam has greatly facilitated the movement of the commodity to Raipur and its surroundings. Besides this, jaggery was known to have been transported to Nagpur and Bombay also. The exact stations to which the commodity is being exported is not known to people other than those who are mainly dealing with the export part of the business. This is a trade secret with the export merchants.

Co-operative Loan and Sale Society. In spite of the sincere efforts of the Co-operative Loan and Sale Society, the local *sowcars* still continue to be the principal money lenders for the cane growers. The *sowcar* will always keep the *ryot* in his clutches and will never bring the money transactions with the *ryot* to a close. Despite the existing visible disadvantages such as high interest and false weightment in transactions with the local *sowcars*, most of the *ryots* continue their dealings with *sowcars* only for the undermentioned reasons :—

1. The *ryot* is always indebted to the *sowcar* and it is his chronic indebtedness that prevents him from clearing his debts.
2. Any amount of money is procurable at a moment's notice without involving any immediate worry on the part of the *ryot*
3. The cordial reception that the *sowcar* gives to the *ryot* with pleasing words and at times with small tips in the form of presents attracts the *ryots* to him.

It was with the main purpose of avoiding these *sowcars* as principal dealers in the jaggery market a Co-operative Loan and Sale Society was started as early as 1930. The society was mainly instrumental in diverting considerable part of the business (15 to 20 per cent) from the hands of the *sowcar* to the society during the short period of nine years of its working.

Table III shows the extent of business done during a period of nine years. Though some of the ryots appreciate the correct weighments and the minimum commission charged, they do not see eye to eye with the society in the matter of dispensing the loans. The ryot seldom gets a loan at the time he is in most need. At times he has to wait for two or three months after putting in his application by which time the jaggery season would be over. The delay to provide him a loan easily makes him forget the benefits of the society.

TABLE III. Statement showing the Progress in the Jaggery business done by Anakapalle Co-operative Loan and Sale Society during 1930 to 1939.

Year.	Quantity in Maunds. (Md. 22½ lbs.)	Value in Rs.	Commission Rs.
1930—31	13045	16053	1315
1931—32	39681	45543	2568
1932—33	65283	50566	3999
1933—34	87439	68992	4118
1934—35	113056	138626	5411
1935—36	145116	119049	6689
1936—37	141151	90737	6585
1937—38	115797	95741	5447
1938—39*	117572	187525	6762

*Business of this year (1938—39) is about 15 to 20% of the entire business in the market.

Defects of the present marketing system. This paper would be incomplete without the mention of the inherent defects of the present marketing system which are calculated to prejudice the interests of the producer as against the interests of the merchants who occupy a decidedly advantageous position. In the first place the whole business of the market is completely in the hands of a few merchants who are experienced in transacting their business for the best part of a century. Secondly the vital aspect of business which has a direct bearing on the net gains of the producer namely the ruling price of the commodity on a particular day is in the hands of merchants, for even at the premises of the society the bidders are only the merchants. Thus the producer ultimately depends for the disposal of his produce on these merchants.

Conclusion. Though the cultivator is an expert in the art of jaggery manufacture, he has no voice in the disposal of his produce and is at the mercy of the merchants who take a disproportionate share of the consumer's price. The formulation of a future marketing policy should be such as to improve the present marketing system in two important directions namely the proper organisation of markets and the systematic grading of the produce.

The lines of organisation of the markets are the inauguration of regulated markets under the Agricultural Produce Marketing and Grading Act, standardisation of weights, licensing of commission agents, regulation of

market charges and allowances and provision of suitable ware-houses. The definite advantages of high premium and the large profits involved in the grading of the produce for the *ryots* needs no special mention. The establishment of grading centres at important jaggery trade centres with definite standards would go a long way in increasing the returns of the jaggery manufacturer.

To make the jaggery manufacturer independent of the loan giving middlemen, a sound marketing policy indicated should be coupled with provision of cheap credit. Co-operation appears to have great potentialities in this direction. The middlemen advance loans before the crop is sown and unless the co-operative societies can furnish to cultivators all the facilities that the middlemen offer them the progress of co-operative effort cannot be rapid or certain. In Baroda, it is learnt, the state has recently commenced the issuing of crop loans for sowing improved types of cotton at $4\frac{1}{2}$ per cent interest. It is obligatory for the farmer who receives the loan to market his produce through co-operative agency. Such a scheme modified to suit the conditions of this Presidency may be tried till co-operative endeavour is able to take up the whole work. A scheme that provides for regulated markets and systematic grading of the produce coupled with the provision of cheap credit through co-operative societies would make jaggery making more paying and would secure for the cane cultivator his due share of the consumer's price which at present is denied to him by innumerable middlemen and unscrupulous traders.

Acknowledgment. I take this opportunity to express my sincere thanks to Sri. C. Ramaswami, M. A., (Cantab.), Junior Lecturer in Agriculture, for his sympathetic criticism and to Sri. T. Nataraj, B. A., B. Sc. (Ag), for the valuable suggestions he has given on the paper. I am also thankful to Sri B. Autchanna Naidu, Secretary of the Co-operative Loan and Sale Society, Anakapalle, for all the information he has given me in the course of my enquiries.

Cropping Behaviour In Mangoes.*

By K. C. NAIK, M. Sc., (Bristol).

&

M. MOHAN RAO, B. Sc. (Ag.)

The fairly frequent occurrence of lean years in mango production and the shy bearing tendencies of many reputed varieties are well-known to form the limiting factors in the successful mango culture all over the world. It is commonly assumed that there is alternate bearing or a definite periodicity of bearing in mangoes. Hartless (1914), Burns and Prayag (1921), Sen (1939) and Singh and Khan (1939) have maintained that lean and good years alternate with each other without exception, while Popenoe (1917 and 1927) states that heavy production in *mulgoa* occurs once in

* Paper read at the thirtieth College Day and Conference of the M. A. S. Union, July 1941.

four years in Florida. One of us (Naik 1940) has recently shown that good or bad cropping years occur at indeterminate intervals and do not conform to any alleged conception of rhythmic or cyclic production. The causes of scanty fruiting in many varieties according to the senior author is due partly to the genetic make up of the individual and partly to the varietal characteristics, while those for lean years in mangoes may be mainly environmental influences including pest and disease incidence. On the other hand, Burns and Prayag (1921) and Popenoe (1927) postulate that the problem is a physiological one connected with the nutritional conditions of the tree.

In fruits subject to such erratic production, a knowledge of some of the pre-fruiting characters which influence or govern productivity is essential, in that it furnishes to the grower a means of predicting the size of the crop and of undertaking in advance suitable measures for regulating the future crop-bulk in the desired channel through modification of the concerned pre-fruiting growth features. In the present paper are outlined the results of investigations carried out at the Fruit Research Station, Kodur, from August 1936 to May 1941 on certain commercial varieties of mangoes on the problem of productivity as affected by growth conditions and by certain blossom biological considerations. In mango where perplexing crop uncertainties upset the growers' expectations occasionally, any effective step towards reducing the swing from heavy to light crops is bound to be of considerable value, and the investigations were all designed with this main objective.

Season of growth, and growth as affected by flowering or fruiting performance. Under Kodur conditions, growth in mangoes is characterised by two active phases, one commencing in February and lasting till June and another occurring in October-November. Minor growth phases may, however, occur mainly in December. The production of a heavy crop of blossom in one season is found to considerably retard the tree-activity in the succeeding season of growth. Shoots which flower but shed the flowers early or in which the fruit drops off at an early stage of development produce a very much larger number of lateral shoots in the subsequent growing season than the non-flowered ones. Shoots that carry fruits to maturity on the other hand either do not produce any laterals at all for the year, or if they give out any, such laterals tend to make poor growth and are mostly produced very late in the year.

Flower Production. With regard to flower production it is observed that panicles are largely borne on the preceding year's growth which may have emerged from the leaders that had either flowered or not flowered that year. Shoots of several years of age have also been noted to produce flowers in some cases, but rarely the fruits are set and carried to maturity on these. During 1940, the percentage of flowering shoots among leaders was 43 in *neelum* and 27 in *bangalora*, whereas among laterals the percentage of cropping shoots was 17 and 18 respectively.

Between the flowered and non-flowered leader or lateral shoots, no statistical difference is observed with regard to flower production in the

succeeding year. Thus the importance of flowered shoots in any given year for the production of flowers in the following season is found to be as great as that of the non-flowered shoots of the same year. The general belief that the shoots that flower in one year are incapable of producing a crop of flowers in the subsequent year is, therefore, erroneous under normal conditions of growth and culture.

It must, however, be admitted that a shoot that flowers need not necessarily carry fruits to maturity. As has already been pointed out, shoots which shed flowers early in the season possess different growth features from those that carried fruits to maturity. Such differential growth features as the poor extension growth and the late production of new growth in shoots that carried fruits to maturity are found to form adverse factors for the production of blossoms in the succeeding season. No profitable crop can therefore be expected from trees which have produced a bumper crop in the previous year and at the same time have failed to record adequate amount of extension growth early in the season on shoots of the previous season. This leads to the conclusion that the effect of flowering on the succeeding year's performance of the shoots is not the same as that of fruiting. Obviously the development of the fruit exerts a more profound influence on the shoot performance in the following year than the production of flowers alone.

The lateral shoots appear to be proportionately of lesser importance than leaders with regard to production of flower buds. Every leader shoot however, is capable of functioning not merely as a single leader but also may produce a number of laterals. Similarly, every lateral shoot is capable of producing in its turn numerous secondary shoots from its axillary buds. Inasmuch as there are a larger number of laterals than leaders on a tree, and that laterals are also found capable of bearing flowers to some extent, it is to be expected that on a tree, panicles borne by the laterals may be far more numerous than those borne by leaders. From this, it may be concluded that because of their larger preponderance in number, the laterals may influence the gross crop-yield to a considerable extent.

The emergence of a high proportion of lateral shoots during the flowering period and the fact that a large proportion of such shoots produce blossoms in the next season are points of great interest and importance, in that the production of flowers and of shoots that flower in the succeeding year go hand in hand, thus ensuring regularity of bearing. Thus, although the importance of leader shoots in determining the crop size has to be recognised, the equally great importance of lateral shoots, especially in varieties wherein they are produced in great abundance, in influencing the gross crop yield and in ensuring regularity of bearing cannot be underestimated. The well-known regular bearing habit of *neelum* is possibly due to its ability to produce a large number of laterals, many of which are potential croppers in the following season.

The time of emergence of lateral shoots is also of considerable importance in regard to blossoming of trees in succeeding years. Observations extending over four flowering seasons have shown that shoots produced in the months of March, April and May produce the largest number of panicles in the succeeding year in all the varieties, excepting in *neelum*, in which those produced in October also bear crop to some extent. This feature of *neelum* is undoubtedly an additional contributory factor for its greater regular bearing habit.

In regard to the period of growth of shoots, observations have shown that trees which ceased growth early, say by the end of May are most prolific in bearing, while those in which the growing was prolonged up to July or August, or which showed growth activity in the season immediately preceding the flowering period failed to produce good crop. An early cessation of growth during the first flush of the previous year as well as a definite dormant period for about a month immediately before the emergence of blossoms are therefore vital for the formation of a good crop of flower buds. It will be recognised that all these favourable conditions for flower-bud initiation such as an abundant production of leader shoots during the first flush, a good extension growth of these, an early growth cessation, a good crop of laterals in varieties like *neelum* and a definite period of dormancy towards the close of the year are subject to be influenced considerably by the prevailing seasonal conditions and to a certain extent by the orchard cultural practices.

Blossoming in relation to varieties and seasonal conditions. The main flowering season under normal climatic conditions for most of the commercial varieties of mangoes grown at Kodur appears to be from December to February. Certain varieties like *neelum*, *rumani*, *allipasand* and *nazukpasand* were observed to produce more than one crop of blossoms and in such cases the period of blossoming and fruit-set are not restricted to any particular periods of the year, depending mainly on the seasonal conditions. The heavy and late rains during 1940 has for example resulted in prolonging the extension growth of shoots during the close of the past year, thus preventing a favourable crop of flowers on one hand, and encouraging on the other the production of an off-season crop of flowers in many varieties in 1941. The dry and relatively rainless summer of 1941 evidently helped the shoots to get the desired dormancy prior to initiation of flower buds. The ability of certain varieties to produce more than one crop of flowers in a year when the first one is destroyed and thereby prolong the fruiting season is a feature of considerable economic interest and importance.

Sex distribution and bearing tendency. The mango panicle is polygamous and bears male and hermaphrodite flowers. Investigations in the 1939 flowering season on 16 varieties have shown that the percentage of perfect flowers varies from 3.47 in *alampur baneshan* to 16.41 in *neelum*. The terminal portions of the panicle were found to have the highest proportion of such flowers, containing more than double the perfect flowers

in *mulgoa*, *baneshan* and *peter*, of that found in the lower parts. This fact is in conformity with the known behaviour of mangoes to bear fruits mostly at the terminal ends.

Observations collected in 1940 flowering season in a young plantation revealed the complete absence of perfect flowers in a panicle of *jahanger*, and a small percentage (0.12) of such flowers in *imampasand*, as compared to 11.7 recorded previously on a 20-year old tree of the same variety. It is possible that the huge variation in the percentage of perfect flowers between trees of the same variety are due to the differing nutritional conditions of the trees or to the differing ages of the trees. At any rate, an extension of the work to elucidate these points seems necessary.

It will be clear that the proportion of perfect flowers in the panicles will be an important determining factor in mango productivity. This has been proved from observations collected in 1940 when a definite positive correlation between the percentage of perfect flowers in the panicle and the number of fruits borne per panicle was established. Thus, *neelum* which has so far shown to possess the highest proportion of perfect flowers produced the maximum number of fruits, while *baneshan* with a relatively poor proportion of such flowers bore a much lesser bulk of fruits. There is reason to believe that, apart from the influence of prefruiting growth characters, the cluster bearing habit of certain varieties and the ability of varieties to withstand damage from high winds are two of the most important contributory causes for regularity of bearing. Of these, the former is undoubtedly associated with a high proportion of perfect flowers while the latter is purely an inherent varietal character.

Marked variations have been observed between varieties in the length of style, length of stamen and distance between stigma and anther tip. The ratio of style length to stamen length has revealed that shorter style length and lower ratios of style length to stamen length observed in certain varieties are helpful in securing a better set of fruits by means of open pollination. This is also a fact that has to be reckoned with in elucidating the causes responsible for heavy yielding nature of some varieties.

Pollination. Several workers (Popenoe, 1917 and Burns and Prayag 1921) have previously shown that mango is eminently suited for cross-pollination. The wide variation between varieties in regard to quality of fruit, yield, time of bearing, regularity of bearing and off-season cropping is also well-established. In order to see how far some of the desirable fruit qualities that are now dispersed in different varieties can be combined, some controlled pollination studies were undertaken in 1939 and were continued during the 1940 and 1941 flowering seasons. Of the 3,561 flowers pollinated, 1,093 set fruits, 48 matured and only 26 were finally available for harvest. These results are obviously unsatisfactory, in view of the fact that observations here and elsewhere have indicated the necessity for pollination in mangoes. But if it is remembered that a mango tree in normal years is capable of producing five to ten thousand panicles, each

with 1,000 to 1,500 flowers. The above figures need not be a matter of surprise and dissatisfaction, as even with about 2% perfect flowers per panicle and with only 1% of these carrying fruits to maturity, the yield from the tree cannot but be high. The data however indicate that a high proportion of perfect flowers when pollinated with the pollen of compatible varieties will be of far reaching importance in ensuring regularity of bearing. Although the available data do not warrant any valid inference in regard to the suitable pollenizers for our cultivated mangoes, strong evidence points out to the suitability of *panchadarakalasa* as a pollenizer for *baneshan*, *bangalora*, *neelum* and *chinnasuvarekha*, and *baneshan* as pollenizer for *neelum*, *jehangir*, and *bangalora*.

Application of Results. Erratic crop production is a special feature of most of our cultivated mango varieties. It has recently been found out at Kodur (Naik 1940) from a study of a number of varieties over a four-year period that there are a very large number of inherently unfruitful or excessively irregular bearing trees in commercial plantations in the Ceded Districts. It would therefore seem that, apart from the proper and regulated supplies of fruits in our internal markets, the main line of activities for the stabilisation and development of mango industry would lie primarily in (1) the planting of choice fruiting, regular bearing, productive and standardized varieties (2) the increase of orchard efficiency so as to obtain the maximum crop every year and (3) the regulation of mango crop by suitable cultural practices with a view to guarantee normal crop and avoid partial or total crop failure in any season.

The data collected at Kodur clearly indicate that, despite wide variation between varieties in regard to growth, there appears to be some easily distinguishable relationship between flower-bud formation and growth characters in the preceding seasons. Since growth in its turn is influenced by a variety of factors such as seasonal conditions, nutritional problems and cultural practices, it is necessary to gain an insight into the effect of all these individually and collectively with the various interplays between themselves for obtaining a full understanding of the contributory causes of the productivity.

While the importance of cultural practices can never be minimised in profitable fruit production, it is essential to recognise certain limitations of such practices also. That selection of parents has a determining influence has already been emphasised. Another factor that has been shown to govern productivity is the proportion of perfect flowers in the panicles. It has also been shown that heavy bearing is associated with the ratio of style length to stamen length. Obviously these features are at present incapable of being altered by cultural practices alone. Hybridisation may offer a possibility, and therefore the importance of a comprehensive scheme of breeding in mangoes is obvious. Rich collection of mango varieties representing the choicest germ plasma has been made or is still being

made in many centres, and an excellent opportunity is available for utilization of this material. The study into the possible methods of improvement of controlled pollination and of the varietal peculiarities should necessarily precede any hybridisation programme.

The effective control of mango production cannot be sought through a limited sphere of research alone. Selection of off season or double or triple cropping varieties, and of those that are capable of producing one or more crops of flowers when the first one is destroyed, appears to be the problem that demands special attention from workers on mango. Selection of more regular bearing varieties of those that bear fruits in clusters and can withstand heavy winds, as well as of prolific individual parents are yet other profitable lines of work which should rightly engage the serious attention of the fruit grower, nurseryman and the horticultural worker alike.

Acknowledgments. A number of assistants and honorary workers have helped in the conduct of this work at different stages of its progress. The authors desire to record their thanks to all these persons as well as to the Imperial Council of Agricultural Research and the Provincial Government under whose joint auspices the investigations were conducted.

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ABSTRACTS

A brief account of the studies on the harmful after-effects of cholam crop on cotton. V. Ramanatha Iyer and S. Sundaram. *Indian Journal of Agricultural Science* 11, (1941).

On the rain-fed black soils of the 'Tinnies' tract, farmers generally follow a four-course rotation of *cholam*—cotton—*cumbu*—cotton. It is commonly observed there that cotton grown after *cholam* is paler in appearance, shorter in growth and poorer in yield than that coming after *cumbu*. According to the data collected at Koilpatti Agricultural Research Station during the past 31 years, the average yield of kapas in the former is 405 lb. as against 471 lb. in the latter. This phenomenon has not been peculiar to the "Tinnies" tract alone but has been observed to exist under conditions obtaining in Coimbatore, Salem and South Arcot of the Madras Presidency, in parts of Bombay and the United Provinces; and is said by American agronomists as a much dreaded feature of *cholam* growing in their arid and semi-arid tracts. Different hypotheses have been put forward by different American workers concerning the nature and

causes of the phenomenon. Three important causes attributed by three different schools of thought are (i) the greater depletion of plant foods by the heavier feeding *cholam* crop—the same opinion is shared by the farmers of the Tinnies tract. (ii) the production of an easily volatilizable toxic body during the decomposition of *cholam* residues which kill all the micro-flora and (iii) the higher sugar contents of the *cholam* stubbles, which encouraged rapid multiplication of micro organisms and created a nitrogen deficiency in the soil. The results of the present study have, however, led the authors to the following conclusions:—

(a) The diminished yield of cotton obtained in the tract on fields cropped with *cholam* during the previous year is found to be caused neither by lack of soil moisture nor by exhaustion of soil nutritives, nor by the presence of toxic products of decomposition; (b) The harmful effects could not be improved by the application of manures, the reduction of plant population or by mixing *cholam* with pulses; (c) Seed setting and duration of *cholam* were observed to influence the intensity of the deleterious effects of *cholam* cropping, since the *cholam* effect was not manifest in the crop cut at shot blade. This phenomenon could be ascribed to the normal penetration of the *cholam* roots into the alkaline regions of the soil below the second foot. (d) the growing of both *cumbu* and *cholam* disturbed differently the sodium ion contents of the soil. In soils cropped with *cholam*, the rise of replaceable sodium was greater with the growth of crop, but its later decline was much slower than that observed in the case of *cumbu* plots. As a consequence former soils were left more alkaline at the time of cotton sowing, which condition would appear to be responsible for the lower yields recorded after *cholam* crops. (e) Correctives for alkalinity could not give conclusive results owing to unfavourable seasonal conditions. It was however, inferred that their application in the lower layers might show better response. (f) *Cholam* could not be replaced by other fodders, (g) Ploughing experiments showed that these soils were not benefited by cultivating them prior to sowing cotton. A saving in the cost of cultivation might be effected by reducing the preparatory cultivation to the minimum. (h) Thick sowing of cotton improved the yields of cotton in "after *cholam*" plots, both in good and poor seasons of rainfall

K. R.

Composition of the alcohol extract of sugarcane leaves as a means of determining soil fertility. C. E. Beauchamp, *Proceedings 13th Ann. Conf. Asoc. Technicos Azucareros Cuba*, 1939, 273—284.

In previous work it was shown that the mineral content of the alcohol extract of sugarcane leaves was intimately correlated with fertilizer applications and with the final yields of this crop. It is now shown that the same principle may be used to determine the potential fertility of different soils for sugarcane. Plots of soil were fertilized with different amounts and proportions of N, P_2O_5 and K_2O ; at a certain age of the cane, samples of leaves of the same order were taken and extracted with alcohol, and the mineral content of the alcohol extract was determined by analysis; from these results the "intensity of nutrition" of the plants was calculated; this figure is composed of the sum of percentages of N, P_2O_5 and K_2O . The intensity of nutrition shows an intimate correlation with cane yields in terms of field weight and sugar content.

In practice, this would be applied as follows: part of the cane field would be fertilized and the rest left unfertilized. The field will then be planted, and when the cane is $3\frac{1}{2}$ months old samples of the leaves will be taken and the mineral content of the alcohol extract found by analysis. If the leaves from the fertilized portion show a higher intensity of nutrition than those from the unfertilized portion of the soil, the crop will doubtless be benefited by a timely application of that particular fertilizer when harvested 22 months after planting.

This method may also be used to compare the apparent fertility of two different fields planted to the same variety at the same time. In terms of the respective levels of nutrition of two different fields of different yielding capacity it may be possible to fertilize the lower yielding field so that its ultimate yield may approach that of the higher yielding field. With suitable modifications the method may be useful in comparing different cane varieties. (*Facts About Sugar*, 35 (Dec. 1940) : 42.)

K. M. T.

Gleanings.

Minute amounts of chemical elements in relation to plant growth. For a long time it was generally believed that only the ten elements, nitrogen, phosphorus, sulphur, calcium, magnesium, potassium, iron, carbon, hydrogen and oxygen were indispensable for the growth of higher plants. Actually in 1869 investigations were carried out on the effects on plants of manganese and zinc; the significance of the results obtained were overlooked and it was not until much later that it was realised that the requirement for normal growth of plants included other elements than "the ten". In 1923 it was definitely established that boron played an essential role in the development of broad bean and other plants, and more recently there has been general recognition of the relationship between certain "minor" elements and some of the physiological diseases of plants. In experiments carried out with water culture, it was found in 1923 that manganese was an indispensable component of a satisfactory nutrient solution. Subsequently the necessity for varying amounts of boron, copper and zinc was discovered. Many plant diseases are now known to be due to deficiencies of these elements. As an example may be cited "mottle leaf" of citrus in South Africa; this is a zinc deficiency and the standard treatment is application of zinc sulphate.

More recently other elements have become known as essential and the increasing interest of this phase of agriculture is evidenced by the extensive literature on the subject. A bibliography compiled in 1935 and 1936 revealed about 3,000 references to some 30 minor elements classified as essential to plants, unessential and doubtful.—*Jour. Jamaica Agri. Soc.* 44 (1940): 438-439.

Value of peanuts*. Of the many things in favour of peanuts the following stand out as most prominent:—

1. Like all other members of the pod-bearing family, they enrich the soil.
2. They are easily and cheaply grown.
3. For man the nuts possess a wider range of food values than any other legume.
4. The nutritive value of the hay as a stock food compares favourably with that of the cow pea.
5. They are easy to plant, easy to grow and easy to harvest.
6. The great food and forage value of the peanut will increase in proportion to the rapidity with which we make it a real study. This will increase consumption, and therefore, must increase production.
7. Two crops per year can be raised.
8. The peanut exerts a dietetic or a medicinal effect upon the human system that is very desirable.
9. There is no other foodstuff that can be so universally eaten, in some form by every individual.
10. Pork fattened on peanuts and hardened off with a little corn just before killing, is almost if not quite equal to the famous Red-gravy hams or the world-renowned Beechnut breakfast bacon.

* Groundnut.

11. The nuts yield a high percentage of oil of superior quality.
12. The clean cake, after the oil has been removed, is very high in muscle-building properties (protein) and the ease with which the meal blends in with flour, meal, etc., makes it of especial value to bakers, confectioners, candy-makers and ice cream factories.
13. Peanut oil is one of the best known vegetable oils.
14. A pound of peanuts contain a little more of the body-building nutrients than a pound of sirloin steak, while of the heat and energy producing nutrients has more than twice as much. (*Journaica Jamaica Agri. Soc.* 44 (1940) : 285).

Review.

Hand Book of Economic Entomology for South India. By T. V. Ramakrishna Ayyar. B. A., Ph. D., Government Entomologist, Madras (Retired., formerly fellow of the Zoological and Entomological Societies of London—for sometime member of the Senate, the Academic Council and of the Boards of Studies in Zoology and Agriculture of the Madras University and Examiner in Agricultural Zoology for the Madras, Bombay and Punjab Universities.

It has to be admitted that in India our knowledge of the numerous relations existing between human beings and lower animals is unfortunately very meagre and especially is it so with regard to the various roles which insects play in different aspects of human activities. The periodical incursions of locusts, waterpillars and bugs and the serious loss thereby caused to cultivators, are familiar examples of the injurious work done by insects to our primary needs of life, viz., food materials; the recent discoveries by scientists that small and apparently innocent creatures like the mosquito, house fly, etc., are capable of disseminating some of the deadly diseases among men and cattle are other examples of insect interference with human activities. Nor are we sufficiently aware of the beneficial roles played by some insects like bees, silkworms, lac insect, etc. It is therefore evident that a knowledge of the economic aspects of insect activities will be very useful to all of us, especially to cultivators, cattle breeders and provision dealers. Studies have been made in these lines in South India for some years past and the Madras Agricultural Department has been carrying on investigations especially on insects affecting agriculture to help the cultivator with advice to control injurious insects and take advantage of the beneficial ones. The results of the studies so far made have been summarised briefly by Dr. T. V. Ramakrishna Ayyar, (until recently Government Entomologist, Madras), in a handbook which is now published by the Madras Government with the idea that it may help the agricultural student, the educated cultivator and all those interested in Economic Entomology. It may also be added that though the book is primarily on South Indian insects it will be found useful to students and farmers in other Provinces also in India since most of the insects noted in the book are also found in the agricultural tracts of areas outside South India.

The matter in the book which runs to 517 pages is conveniently divided into two parts—the first part, including the first six chapters is on general Entomology and deals with the fundamental characters connected with the structure, life history and habits of insects in general, so as to serve as an introduction to them, the more important matter in Part II which deals with the various South Indian insects of economic importance, such aspects of different field crops, stored products, etc., and the beneficial insects like silk worms, the lac insect, honey bees and friendly forms. Part I will be found very helpful to the beginner in Entomology and to amateur farmers to understand more clearly the matter in Part II.

The first five chapters of Part II deal with insect pests of crops in general, the different categories of such pests; general factors regarding pest outbreaks and the various methods of control which may be adopted to suit different pests found in different localities and under different natural conditions. From chapter X the subject matter is devoted to pests of different crops such as those of paddy, millets, cotton, oil-seeds crops, fruit crops etc. There are also chapters dealing with insect pests of cattle and stored products, household and disease carrying insects and beneficial forms like parasites, predators, etc.

As a supplement to these chapters are added a few appendices on (1) the systematic arrangement of pests, (2) on insect classification, (3) on hints and formulae to collect and treat insect pests and on insect technique, (4) on some non-insect pests of crops and insectivorous animals and (5) a Bibliography on South Indian Economic Entomology including the more important publications on the subject for the past thirty years.

The book is profusely illustrated with a very interesting coloured frontispiece on paddy insects; the printing and get up of the book are also found to be satisfactory. With all its inevitable short comings it is presumed that the book will be found very useful to all students of agriculture, economic entomologists, educated farmers and orchardists.

The book is priced very low (Rs. 4/12) especially in view of the number of illustrations (413 in number+coloured frontispiece) which considerably enhance the scientific and practical value of the publication.

Copies of the book can be had of the Superintendent, Government Press, Madras, and the Director of Agriculture, Madras.

Crop and Trade Reports.

Statistics—Crop—Groundnut—1941—Summer and early crops—Condition report. Sowings of the summer crop of groundnut are generally restricted in all districts owing to (i) want of timely sowing rains, (ii) propaganda for the restriction of groundnut cultivation and (iii) the low price of groundnut at the time of sowing. Sowings of the early crop in the districts of Salem and Coimbatore are reported to be below normal due to the late receipt of sowing rains.

Harvest of the summer crop of groundnut has commenced in parts. The yield per acre is expected to be normal in Chingleput, South Arcot, North Arcot and Madura and below normal in the other districts. The condition of the early crop of groundnut is satisfactory.

The wholesale price of groundnut (shelled) per Imperial maund of 82 $\frac{2}{7}$ lb. (equivalent to 3,200 tolas) as reported from important market centres on 7th July 1941 was Rs. 4-4-0 in Vizagapatam, Rs. 4-2-0 in Vizianagaram and Cuddalore, Rs. 3-15-0 in Guntur, Rs. 3-12-0 in Vellore, Rs. 3-11-0 in Cuddapah, Rs. 3-7-0 in Salem, Rs. 3-5-0 in Adoni and Bellary, Rs. 3-4-0 in Hindupur, Rs. 2-15-0 in Tadpatri and Rs. 2-14-0 in Nandyal. When compared with the prices published in the last report, i. e., those which prevailed on 7th April 1941, these prices reveal a rise of approximately 20 per cent in Cuddapah, 18 per cent in Vizianagaram and Vellore, 16 per cent in Cuddalore, 13 per cent in Vizagapatam, Adoni and Hindupur, ten per cent in Nandyal, Bellary and Salem, nine per cent in Guntur and four per cent in Tadpatri.

(From the Director of Industries and Commerce, 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 18th July 1941 amounted to 435,828 bales of 400 lb. lint, as against an estimate of 503,500 bales of the total crop of 1940-41. The receipts in the corresponding period of the previous year were 364,678 bales. 386,630 bales mainly of pressed cotton were received at spinning mills and 30,603 bales were exported by sea while 92,905 bales were imported by sea mainly from Karachi and Bombay.

(From the Director of Agriculture, Madras).

Mofussil News and Notes.

Karur. Agricultural excursion. The Headmistress and Assistants of the Government Training School, Karur, led a party of 200 pupils and pupil teachers, on an agricultural excursion to Melapalayam on 12-7-41, leaving Karur by 3:18 P. M. train. They reached Senaipirathi R. S. within 10 minutes of their departure and they were taken by the local Demonstrator to the village about 6 furlongs from the station. One of the objects which created much interest in the pupils was a coconut tree with 7 branches at the crown. The village site, the fields round-about, the standing crops of groundnut, turmeric and onions, were shown to them. Details about the economics of growing money crops, the village cottage industries such as pottery, oil mill, mat-weaving and bee-keeping were explained to them by the Demonstrator. Ideal cattle sheds and manure pits ere also seen. The party returned to Karur by 7 P. M.

The Secretary, Agricultural association, Karur, who is also the village Headman of Melapalayam helped in furnishing details about village life. A. R. K.

Tiruchengode. Under the auspices of the Tiruchengode taluk association for rural uplift and amusements, a taluk tournament and rural exhibition were held at Tiruchengode (Salem district) from 27-6-41 to 1-7-41. On this occasion an agricultural exhibition was arranged and this was visited by about 200 ryots from the surrounding villages every day. Improved implements suited to the tract, departmental strains of paddy and cotton, cream jaggery, posters explaining the preservation of manure, control of diseases and pests, bee-keeping and specimens of green manure crops were exhibited. Fruits and vegetables produced by ryots and honey extracted from hives maintained by private individuals were other interesting items. The departments of Health and Veterinary also participated. The rural uplift van with loud speaker maintained by the Salem District Board was available on the opening and closing days. The Revenue Divisional Officer, Sankaridrug, opened the exhibition in the presence of a large gathering and the Dy. Registrar of Co-operative Societies and Special Development Officer, Salem, were also present. On the final day various rural games organised as counter attractions against drink were arranged and prizes were distributed by R. M. Sundaram, Esq. I. C. S., Collector of Salem. The function was largely attended and among those present were the Revenue Divisional Officer, the Dy. Registrar of Co-operative Societies, District Agricultural Officer and Special Development Officer, Salem and Assistant Marketing Officer, New Delhi. R. C.

Tiruppur. The annual car festival at Tiruppur comes off in the *Visaka Nakshatra* in the Tamil month of *Vaikasi* (May-June). On this occasion, a large-scale cattle fair is held here. Horses, ponies, sheep, etc., are also brought to the fair. Tiruppur being close to the famous Kangayam breeding tract, the majority of the cattle brought to the fair are 'Kangayams' which are poor milkers but the best fitted for hard draught work.

The District Agricultural Association, Coimbatore, usually arranges a Cattle and Pony Show with an Agricultural and Industrial exhibition in alternate years to encourage better production of cattle, sheep, horses and ponies, agriculture and other industries by awarding a very large number of prizes to a money value of about Rs. 1500 in the shape of gold and silver medals and cash for the best exhibits of different category. The shows and exhibitions during such years become very important and attract a large congregation of ryots from all over the district of Coimbatore and other Tamil districts. The show is specially important as the best cattle in the district of Coimbatore, the famous Kangayam breed, are brought for exhibition and sale. The Pattagar of Palayakottai is the best reputed breeder of Kangayams and usually puts up the largest number of the best animals of different category and most of the prize animals entered for competition are those belonging to him.

This year the car festival came off on the 7th June 1941. The District Agricultural Association, Coimbatore, arranged the 23rd Cattle and Pony Show with the Agricultural and Industrial exhibition from the 10th to 12th June. The exhibitions were staged by the various Departments of Government, as Agricultural, Veterinary, Industries, Public Health, etc. and private individuals also took part in the show and exhibitions. A very large number of cattle, horses, and ponies, were brought from within and outside the district and far off places as Ahmedabad, Benares, etc. The cattle consisted of pure Kangayam-cows, heifers, bulls and calves of different ages, stud bulls, work-bullocks, local, Alambadi, buffaloes, etc. About 10,000 heads of cattle will not be a wrong estimate.

The Agricultural Department put up the show as usual with a large collection of improved implements, machinery, strains of crops, different fodders, finished products as malts, malt-preparations, cream jaggery, banana figs, banana flour, fruits, vegetables, diseased specimens of crops damaged by insects and fungi, specimens of insects, appliances for control measures; sidelines of farming, poultry, apiculture, manures and manure seeds, model cattle sheds, silage pits, several charts and posters on agricultural subjects. *Ryots* of different taluks in the district also entered into competition and won 25 cash prizes and certificates of merit.

The show and exhibition were opened by A. R. C. Westlake Esq., I. C. S. District Collector, Coimbatore, on the 10th and the prizes were distributed by T. J. Hurley Esq., Director of Veterinary services, Madras, on the 12th June.

M. S. P.

Samalkot. The old boys of the Agricultural College, Coimbatore, employed on the Agricultural Research Station, Samalkot and in some of the taluqs in the Godavary Districts assembled on 10-7-41 at the Farm and celebrated the Agricultural College Day in a fitting manner with Sri. S. Sitarama Patrudu District Agricultural Officer, Cocanada presiding over the celebrations. Sri. M. Satyanarayana, Farm Manager, T. Lakshmiipathi Rao, Agricultural Demonstrator, and the President made vivid references to the college life and the unique privilege the sons of the *alma mater* have in serving the country. The simultaneous celebrations of the function by the daughter institutions scattered over various parts of the Presidency is a new note struck by the President. Full thirty years have passed since the institution at Coimbatore sent out its first batch of students and retirements have also started with Rao Bahadur K. T. Alwa from that batch. Growing from strength to strength the old boys in distant districts ever keep nascent their comradeship through annual celebrations in such manner.

War fund meeting. Collections were also made for war fund from the assembled and remitted to the Secretary, District War Committee, East Godavari.

M. S.

College and Estate News.

Students' Corner. At the first general body meeting of the Students' club held on the 25th June with Sri. H. Shiva Rao, the Vice-President of the Students' Club, in the chair, the following office bearers of the Students' Club were unanimously elected for the year 1941-42.

<i>Club Secretary</i>	Mr. H. Gurubasavaraj.
<i>Games Secretary</i>	„ M. C. H. Koulutalayya.
<i>Cricket Captain</i>	„ V. Devadass Kamath.
<i>Tennis Captain</i>	„ P. Y. Chintamani.
<i>Hockey Captain</i>	„ T. L. Narasimha Rao.
<i>Foot-ball Captain</i>	„ Mirza Anser Baig.
<i>Badminton</i>	„ S. Ramanadham.
<i>Volley ball</i>	„ T. P. Nageswara Rao.
<i>III Class Representative</i>	„ K. Ranga Rao.
<i>II Class Representative</i>	„ C Srinivasan.

After the first year was formed on the 14th of July Sri. K. R. Narayanaswami, B. A., was elected as the representative of that class.

The students entertained Sri. K. Sanjiva Shetty, Assistant Lecturer in Agriculture, at Tea on Friday, the 26th June, on the eve of his transfer to Udipi as Agricultural Demonstrator.

The second general body meeting of the Students' Club was held on Thursday, the 17th July, with Sri. H. Shiva Rao, the Vice-President, in the chair, to consider the budget for the year. Allotments were made to various activities of the club. Dailies, literary and scientific journals and other magazines also were voted for for the year.

The senior students of the college welcomed the first year and the short course students at a Tea party held on the 18th of July when Mr. R. C. Broadfoot, the Principal, presided over the function. There were present also at the function a number of officers from both the research and teaching staff.

Cricket match. Taking advantage of the presence of a number of officers, who had distinguished themselves in games while at College,—on the occasion of the College Day and Conference an enjoyable cricket match was played in a holiday spirit between the 'old boys' and the College eleven on Sunday, the 13th July. G. S. Dutt (brother of Mr. N. L. Dutt) of the Lahore University eleven assisted the College. Although Kamath, the College captain correctly named the coin, he very sportingly allowed the 'old boys' to have the first tenancy at the wicket. The 'old boys' compiled a creditable score of 220 runs for 8 wickets to which K. M. Narayanan made a valuable contribution of 114 runs in an attractive innings and retired.

The College eleven commenced batting soon after tea, Dutt and Krishnan who opened the innings gave a good start but the others who followed failed to turn it to advantage. The young Lahore University player played a neat and forcing game for his 89 making delightful strokes all round the wicket. The College team's career was brought to a close at 141 runs.

'Old boys'. S. Varadarajan (Captain) K. M. Narayanan, M. Mukundan, T. S. Lakshmanan, K. Santanam, N. M. Naidu, E. S. Kothandaraman, Kanakaraj David, N. R. Nagaraja Rao, N. Baskara Reddy and C. K. V. Manian.

College. V. D. Kamath (Captain), B. S. Krishnan, C. Sankara Rao, Tiruvengadam, K. Vijayaraghavan, Narasimham, Krishnamurthi, Radhakrishnan, Ramachandran, G. S. Dutt and H. Shiva Rau.

Milk supply to residents of the Estate from the College Dairy stopped. The Government Order No 771 Development dated 22nd April 1941 states that the College Dairy should be converted into a purely educational concern and the herd on the farm should therefore be reduced.

In accordance with the G. O. the milk supply to the residents of the estate has been stopped from 1st July 1941.

A. R. P. Lectures Under the auspices of the Coimbatore Agricultural College and Research Institute Division of the St. John Ambulance Brigade overseas, two very interesting and exceedingly instructive A. R. P. (Air Raid Precaution) lectures were very kindly delivered by Dr. M. C. Condillac, District Medical Officer, Podanur, on the 14th and 21st July at the Freeman Hall when Mr. R. C. Broadfoot, the Principal, presided. The lectures were illustrated with explanatory drawings which were projected on the screen by means of the epidiascope with the kind assistance of Mr. B. M. Lakshmi pathi Mudaliar, the Research Engineer. On both the occasions Dr. K. Narayanan thanked the lecturer as well as the President for all their kindness.

The Association of the Upper Subordinate Officers of the Madras Agricultural Department.

The Annual general body meeting of the above Association was held on the 13th July in the Freeman Hall with Sri. D. Marudarajan, President, in the chair.

The Minutes of the last general body meeting were read by the Secretary, Sri. M. S. Kylasam and adopted by the general body. The Annual Report for 1940—41 was then presented which was also adopted unanimously.

The following office bearers were elected for the year 1941—42.

Sri. S. Ramachandra Ayyar	<i>President.</i>
„ M. S. Kylasam	<i>Secretary.</i>
„ S. V. Doraiswami	}
„ T. S. Ramakrishnan	
„ T. Venkataramana Reddi	
<i>Members of the working committee.</i>	

Sri. T. Natraj proposed a vote of thanks to the retiring committee. The Meeting then adjourned to tea.

Weather Review—JUNE 1941.

RAINFALL DATA

Division	Station.	Actual for month	Departure from normal @	Total since January 1st	Division	Station	Actual for month	Departure from normal @	Total since 1st January	
Circars	Gopalpore	7.9	+2.1	9.0	South	Negapatam	0.0	-1.3	4.7	
	Calingapatam	5.2	+0.5	6.7		Aduthurai *	0.0	-1.5	5.2	
	Vizagapatam	6.8	+1.9	12.7		Madura	1.5	+0.1	11.4	
	Anakapalli *	3.5	-1.0	10.8		Pamban	0.3	+0.2	8.9	
	Samalkota*					Koilpatti*	0.3	-0.2	5.8	
	Maruteru*	11.0	+6.7	11.5		Palamkottah	0.2	-0.4	7.4	
	Cocanada	26.2	+21.4	30.1						
	Masulipatam	5.1	+0.6	5.6		West Coast	Trivandrum	12.7	+0.0	35.8
	Guntur*	3.7	+0.4	5.2			Cochin	35.1	+6.6	57.2
Ceded Dists.	Kurnool	1.2	-1.7	2.0	Calicut		40.3	+6.2	68.1	
	Nandyal*	3.0	-1.4	4.5	Pattambi *		39.4	+16.0	67.6	
	Hagari *	0.9	-0.9	3.5	Taliparamba *		43.6	+6.2	53.7	
	Siruguppa*	3.4	+0.5	7.0	Kasargode *		48.6	+9.9	55.5	
	Bellary	0.9	-1.0	6.8	Nileshwar*		53.3	+12.6	63.8	
	Anantapur	1.0	-1.0	2.7	Mangalore		30.6	-6.2	35.0	
	Rentachintala	1.9		3.2						
	Cuddapah	3.5	+0.6	6.6	Mysore and Coorg	Chitaldrug	2.1	-0.7	4.5	
	Anantharajupet *	2.5	+0.2	0.0		Bangalore	3.9	+1.0	10.8	
Carnatic	Nellore	2.9	+1.6	3.1		Mysore	4.2	+1.3	16.1	
	Madras	3.8	+1.9	4.7		Mercara	37.8	+11.4	48.2	
	Palur *	0.0	0.0	0.0						
	Tindivanam *	1.1	-1.1	2.6	Hills	Kodaikanal	4.4	+0.3	15.7	
	Cuddalore	0.2	-1.3	6.8		Coenoor				
Central	Vellore	1.4	-1.0	4.9		Ootacamund *	9.4	+6.1	19.8	
	Gudiyattam*	0.8	-1.7	3.9	Nanjanad *	11.6	+3.6	20.9		
	Salem	1.4	-1.5	9.7						
	Coimbatore	6.2	+4.5	11.9						
	Coimbatore									
	A. C. & R. I.*	6.6	+5.1	12.9						
Trichinopoly	0.0	-1.4	3.5							

* Meteorological Stations of the Madras Agricultural Department.

@ From average rainfall for the month calculated up to 1937 (published in Fort St. George Gazette).

Weather Review for July 1941.

The depression which formed in the west Central Bay at the end of May deepened on the 2nd and occasioned locally heavy rain, Cocanada reporting a record fall of 19.7". The depression became unimportant the next day. Another depression formed at the head of the Bay on the 4th and intensifying into a cyclonic storm crossed the coast near Cox's Bazaar on the 5th and weakened thereafter.

A third depression formed at the head of the Bay on the 14th and passed inland by the 16th and filled up. Conditions again became unsettled at the head of the Bay on the 22nd and developed into a depression by the 24th, but weakened by the 26th, and again developed with a shallow depression near Saugor Island on the next day and by the end of the month still lay centred off the Orissa Coast.

The monsoon was generally strong throughout the month on the West Coast of the peninsula and in the North Madras Coast and Orissa. Rainfall was in large excess on the West Coast, parts of Circars, Mysore and Coorg and the Hills and in slight defect elsewhere.

The chief falls reported are :

Cocanada	19.7"	2nd
Pattambi	11.99"	
Calicut	9.8"	10th
Pilicode	8.1"	10th
Taliparamba	7.7"	
Cochin	6.2	12th
Kasaragod	6.0"	12th
Coimbatore A. C. R. I.	5.8"	9th
Nanjanad	5.6"	8th
Mangalore	4.0"	8th

Weather Report for the Agricultural College and Research Institute Observatory.

Report No. 6/41.

Absolute maximum in shade	...	92.0°F
Absolute minimum in shade	...	67.8°F
Mean maximum in shade	...	87.5°F
Departure from normal	...	-1.5°F
Mean minimum in shade	...	73.7°F
Departure from normal	...	+0.6°F
Total rainfall for the month	...	6.56"
Departure from normal	...	+5.08"
Heaviest fall in 24 hours		5.75" on the 9th (<i>Record fall</i>)
Total number of rainy days	...	2
Mean daily wind velocity	...	4.7 M. P. H.
Departure from normal	...	-2.7 "
Mean humidity at 8 hours	...	68.3%
Departure from normal	...	-1.2%

Summary. There was a thunderstorm of 5.75" on the 9th which is a record fall. The regular South West monsoon set in with the characteristic south-westerly wind towards the last week of the month. The day temperatures were below normal while the night temperatures were slightly above normal. The humidity was in defect while the rainfall was in large excess of the normal.

P. V. R. & S. V. K.

Departmental Notifications.

Gazetted Services.

1. Appointment.

Sri. S. Ramachandra Ayyar, permanent Assistant in Entomology, is appointed to officiate as Assistant Entomologist, Coimbatore, in category 6, class I, Madras Agricultural Service *Viz* Sri. T. V. Subrahmanya Ayyar granted leave.

2. Leave.

Name of officers.	Period of leave.
Janab Saadat-ul-lah Khan Sahib Bahadur, Dy. Director of Agriculture	Leave on half average pay for 2 months from 3-7-41.
Sri. K. Ramayya, Paddy Specialist on foreign service as Geneticist and Botanist, Indore,	L. a. p. for 1 month from the date of relief.
Sri. T. V. Subramanya Ayyar, Asst. Entomologist, Coimbatore,	L. a. p. for 1 month from the date of relief.
„ V. T. Subbayya Mudaliar, Dist. Agri- cultural Officer, Bellary,	L. a. p. for 6 months from the date of relief

Subordinate Service.

1. Appointments.

1. Sri. S. M. Kalyanarama Ayyar, Assistant in Cotton, is appointed to be in full additional charge of the post of Gazetted Assistant, Mungari Cotton Scheme, Adoni, in addition to his own duties Vice Sri. Jagannatha Rao appointed Agricultural Officer, Coorg or until further orders.

2. Sri. D. B. Krishna Rao, B. Sc. (Hons), M. Sc., is appointed as Librarian, Agricultural College, Coimbatore on Rs. 60-6/2-120 in class 23, Madras Central Subordinate Service, with effect from 23rd July 1941.

2. Promotions.

The following promotions of Lower Subordinates are ordered with effect from the dates noted against each:—

From IV grade—Rs. 75-4-95 to III grade Rs. 100.

1. Sri. L. R. Narayana Ayyar, A. A. D. Tirutturaipundi, with effect from 18-9-1940.

2. Sri. M. L. Narayana Reddi, A. A. D. Anakapalli, with effect from 14-5-41.

From V grade—Rs. 45-3-75 to IV grade—Rs. 75-4-95.

1. Sri. S. Venkatarama Ayyar, A. A. D. Mannargudi, with effect from 18-9-1940.

2. Sri. Y. Venkateswara Rao Nayudu, A. A. D. on foreign service as Market-yard Superintendent under the Tobacco Market Committee, Guntur, with effect from 14-5-1941.

2. Transfers.

Name of officers	From	To
Sri. K. Balaji Rao,	A. A. D. Siruguppa,	A. A. D. Adoni.
„ N. K. Thomas,	F. M. Central Farm Coimbatore,	Asst. in Botany, Gudiyattam.
„ T. Paramanandam,	Under the Tobacco Market Committee, Guntur,	F. M. Nandyal.
„ M. Vaidyanatha Ayyar,	A. D. (on leave)	A. D. Madakasira.
„ Y. Venkateswara Rao Nayudu,	Under the Tobacco Market Committee, Guntur,	A. A. D. Gudivada.
„ C. S. Sankaranarayana Ayyar,	A. D. Hosur,	A. D. Polur.

„ M. Narayana Ayyar,	A. D. Polur,	A. D. Hosur.
„ D. Panakala Rao,	A. D. Ramachandrapur,	A. D. Tadepalligudam.
„ V. Buchi Raju,	A. D. Chintalapudi,	A. D. Nugru* (E. Godavari Dt.)
„ P. Lakshminarayana,	A. A. D. Chodavaram,	A. F. M. Samalkot.
„ M. V. Narasimha Sastry,	A. F. M. Samalkot,	A. A. D. Chodavaram.
„ G. Sitharama Sastry,	A. D. Gudivada,	A. D. Sathanapalle* (Guntur Dt)
„ T. Rangabrahma Rao Naidu,	Vuyyuru Sugarcane, Growers' Co-operative Union, Vuyyuru,	A. D. Tiruvur* (Kistna Dt)
„ K. Purushotham,	A. D. Hospet,	F. M. Kalahsti
„ T. V. Srinivasacharlu,	A. A. D. Ambasamudram,	A. A. D. Sriperumbudur.

* New sub circle.

3. Leave.

Name of officers	Period of leave.
Sri A. Venkobachari, A., A. D. Harpanahalli,	L. a. p. for 3 months from 1-7-41.
„ Y. Venkateswara Rao, Under the Tobacco Market Committee, Guntur,	L. a. p. for 3 months on m. c. from 22-5-41
„ B. N. Padmanabha Iyer, A. D. Gingee,	Leave on half average pay for 1 month from 1-7-
„ T. Paramanandam, Under Tobacco Market Committee, Guntur,	Extension of l. a. p. for 1 month from 16-6-41.
„ M. A. Balakrishna Ayyar, A. D. Wallajah,	Extension of l. a. p. for 1 month from 6-7-41.
„ B. P. Papaiah, A. A. D. Chintalapudi,	L. a. p. on m. c. for 2 months from 25-5-41.
„ T. Devasikhamani, A. D. Jammalamadugu,	L. a. p. for 30 days from 26-6-41.
„ C. S. Sankaranarayana Ayyar, A. D., on leave.	Extension of l. a. p. for 1 month from 21-6-41.
„ P. Somayajulu, A. D. Salur,	L. a. p. for 40 days from 26-7-41.
„ S. Venkatarama Ayyar, A. D. Sriperambudur,	L. a. p. for 5 months and 19 days on m. c. from 26-3-41.
„ N. V. Kalyanasundaram, F. M. Kalahasti,	L. a. p. for 3 months from the date of relief,
„ C. C. Balanna, A. D. Allagadda,	L. a. p. for 1 month from 25-7-41.