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Indian Tobacco

Jan - March 1957



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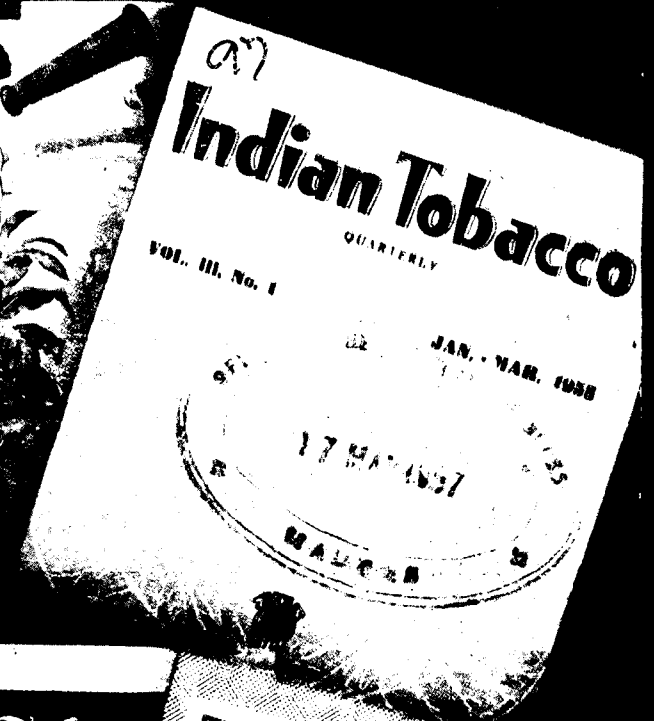
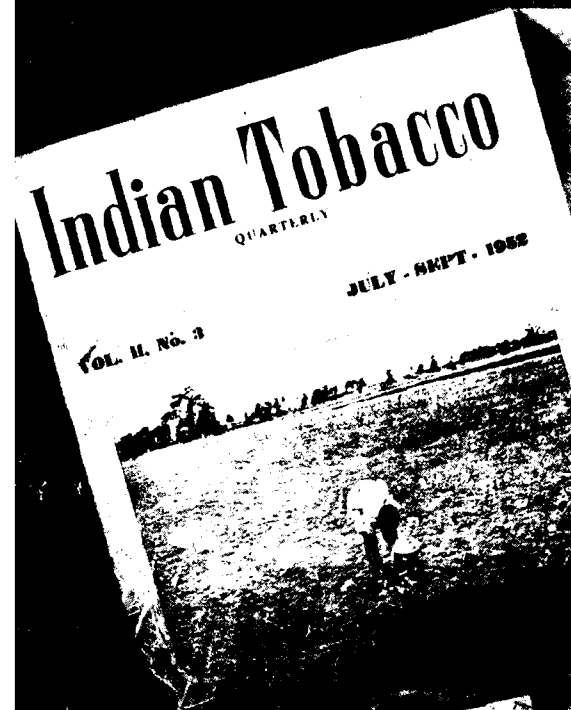
Indian Tobacco

Volume VII, No. 1

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INDIAN TOBACCO

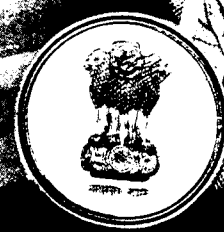
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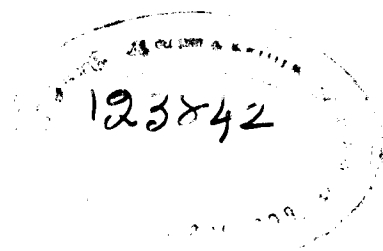


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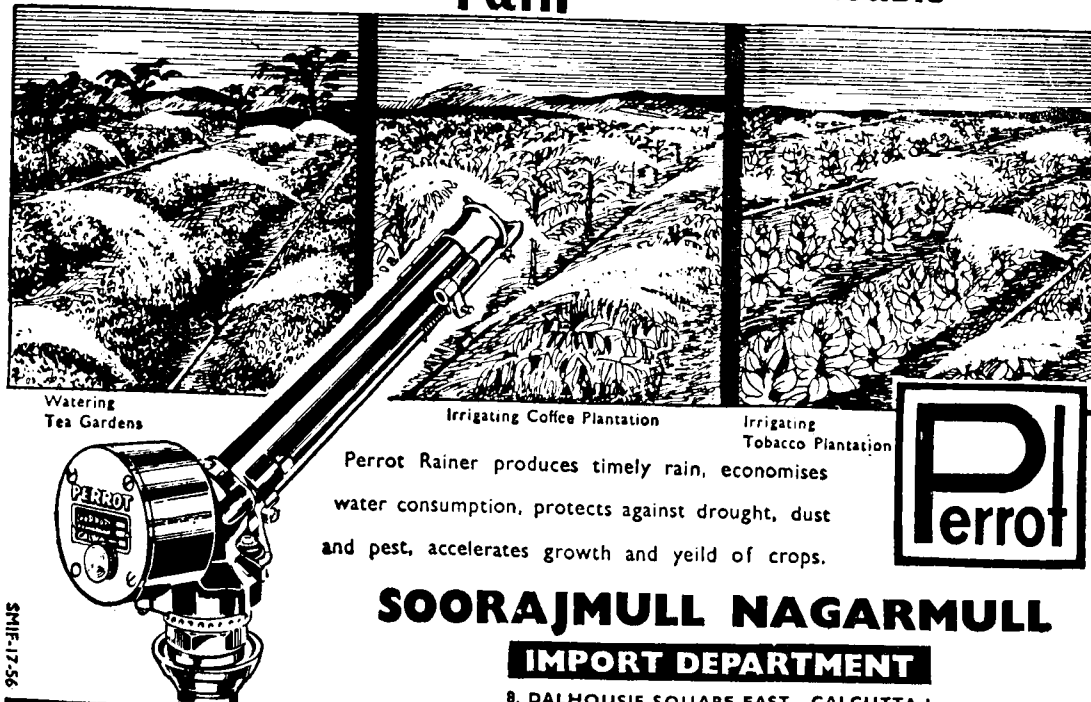
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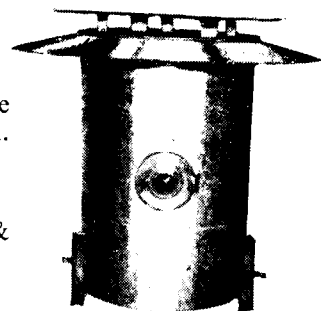
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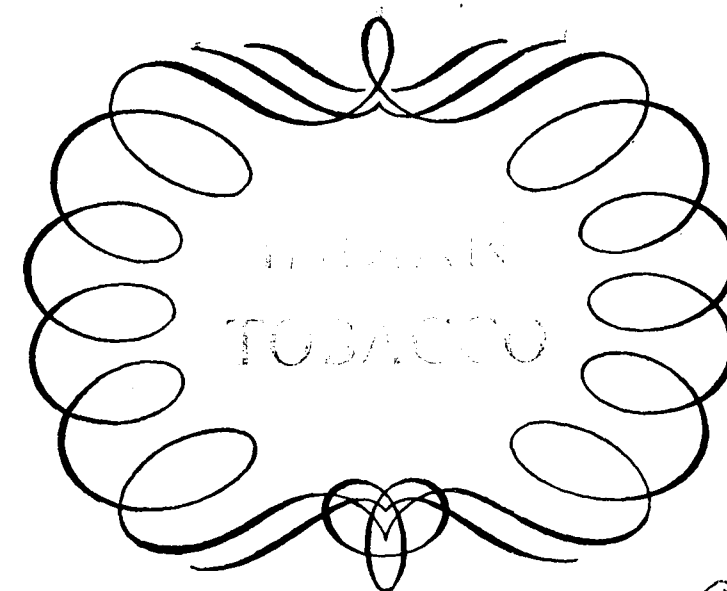
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NINETEENTH MEETING OF THE INDIAN CENTRAL TOBACCO COMMITTEE

The Twelfth Annual Meeting and the 19th Ordinary Meeting of the Indian Central Tobacco Committee were held on 30th January, 1957 at Bangalore under the chairmanship of Dr. B. N. Uppal, the Agricultural Commissioner with the Government of India and President of the Committee. The Meetings were inaugurated by the Union Minister for Agriculture, Dr. Panjabrao Deshmukh.

The various Sub-committees met on 28th and 29th January and made their recommendations to the full Committee.

Dr. B. N. Uppal, the President addressed those present as follows:

GENTLEMEN,

"I have great pleasure in welcoming you to this full committee meeting of the Indian Central Tobacco Committee. We are fortunate in having in our midst to-day Dr. Panjabrao Deshmukh, Union Minister for Agriculture, who has very kindly spared time from his other heavy engagements to inaugurate this meeting. I am very happy to extend a hearty welcome to him on behalf of all those present here.

"For over a year, i.e. from October, 1955 to October, 1956, the work of the Committee was guided by my predecessor, Dr. M. S. Randhawa, with great ability. I would like to convey to him the appreciation of the Committee for the valuable work he has done.

"We are meeting to-day for the first time in Bangalore, the capital of the Mysore State which occupies the third place among the tobacco growing States in the country. We are grateful to the State Government and the Chairman of the Mysore Tobacco Company, for the facilities provided for our meeting.

"Since we met last, 12 members have joined us on fresh nomination or renomination. To them I extend on your behalf a warm welcome. Thirteen of our members on the Committee would be retiring on the 31st March this year, and I take this opportunity of thanking them on behalf of the Committee for the useful work they have done during their tenure of membership.

"With improvement in the dollar situation it has become increasingly important to step up the quality standards of tobacco leaf used for cigarettes. The market demand is becoming more and more exacting and discriminating, and it is necessary that the quality of Indian Virginia tobacco should improve progressively if we are to maintain our importance in world markets and want to expand exports. Realising the urgency of the matter, the Union Government have provided additional funds to the Committee for intensification of tobacco research during the Second Plan period. They have also sanctioned Tobacco Extension Schemes in important production areas to help the

JANUARY—MARCH 1957



Dr. B. N. Uppal, President of the Committee, addressing the 19th Meeting of the Indian Central Tobacco Committee, held in Bangalore on 30th Jan. 1955.

growers in adopting improved methods of cultivation, and thereby to secure quality improvement as also higher returns.

"The research institutions under the Committee have completed one more year of useful work. Detailed reports on their activities are already in your hands, and I would not take your time in dwelling on these. However, a few of the more significant findings of research need special mention, and I would sum up these briefly. It has been shown that (i) it is possible to produce seedlings of flue-cured Virginia tobacco in heavy black soils if nurseries are located on raised beds and are treated with Perenox; (ii) pre-treatment of seed by exposure to low temperatures gives quick germination as also seedlings of uniform growth for transplantation at any particular time; (iii) it is possible to control cutworms,

both in the nursery and in the field, by spraying the soil with D. D. T., and the ground beetles in the field by the application of Dieldrin 50% W. P. in transplantation water; (iv) ash disease could be controlled satisfactorily by the application of sulphur to the soil in between the rows of the plants, at a low rate of 20 lbs. per acre; (v) the farm method of cultivation, adopted in trials in cultivators' fields in the Pusa region, could give as much as 40% additional yield, while increasing the production of the first grade leaf of hookah & chewing tobacco by 30%; (vi) the relationship between the burning quality of the leaf and its chemical constituents in the case of cigar tobacco can be reduced to a formula. Besides these findings, there are two other important developments which may also be referred to. First, the saline lands in the tract growing flue-cured

Virginia tobacco in Andhra Pradesh have been surveyed, and the highly saline areas unsuitable for Virginia tobacco cultivation have been mapped out tentatively. Second, preliminary trials on the growing of wrapper tobacco at an altitude of about 4000 ft. in Thonemalai hills point to the possibility of cultivation of high quality wrapper tobacco in India.

"Shortly after our last meeting, Dr. N. R. Bhat, Director of Tobacco Research, visited Southern Rhodesia to study the methods of production of flue-cured tobacco with a view to introducing these, to the extent possible under Indian conditions, for improving the quality of our cigarette tobacco. Based on his report, a number of steps, including studies in the effect of soil improvement by deep tillage, thorough incorporation of humus into the soil, and conservation of moisture by mulching in order to stimulate the response of flue-cured Virginia tobacco to manuring, have already been taken.

"The construction of the laboratory building of the Central Tobacco Research Institute at Rajahmundry, which started in January, 1955, is almost complete, and some sections have already moved into it. We expect that it would be possible to shift all the sections to the new building by June next. I am also glad to inform you that Government have sanctioned the construction of the much needed residential and non-residential buildings at the Hookah & Chewing Tobacco Research Station, Pusa, as well as at the Wrapper & Hookah Tobacco Research Station, Dinahata. As regards the shifting of the Cigar & Cherooot Tobacco Research Station, Veda sandur, to a more suitable place, trials are being conducted at a few places in the Coimbatore District, and the results are expected to be available at the end of the current season.

"The schemes sanctioned for intensification of tobacco research under the second Five-Year Plan fall into two categories, viz., Central Schemes and State Schemes, the former being under the direct control of the Indian Central Tobacco Committee, and the latter to be run through the agency of the state Governments. Expenditure under most

of the Central Schemes relates to capital items, such as provision of buildings, land, and equipment. The production and distribution of pure seeds and seedlings, training in improved methods of cultivation, handling, and curing of tobacco, and establishment of a tobacco Research Station at Hunsur in the Mysore State, are among the important schemes for which the Committee is responsible. The first two schemes have already been initiated, and the third scheme will be taken up shortly. The state Government have since intimated that the land for the Research Station was ready to be handed over to the Committee. The Hunsur Station would concentrate on the production aspects of Virginia cigarette tobacco and indigenous tobacco under conditions peculiar to the Mysore State, which are entirely different from those prevailing in Andhra Pradesh where the cultivation of Indian Virginia cigarette tobacco is largely localised at present.

"As regards the State Schemes, some have already been started, while others, which have been delayed due to the reorganisation of States, are expected to be taken up shortly. I would also like to point out that some States have not furnished to the Committee/Ministry of Agriculture quarterly reports in respect of the schemes sanctioned under the Second Five-Year Plan. These reports are very important as they are scrutinised by the Planning Commission, and it is necessary they should receive the priority which their importance deserves.

"The Research Stations of the Committee are also continuing developmental activities, such as the distribution of pure seeds and seedlings; dissemination of information on improved methods of production; organising Farmers' Weeks; training persons interested in the art of tobacco production and the technique of flue-curing cigarette tobacco, as also village level workers, Extension staff, Central Excise field staff, and State Governments' agriculture staff; holding demonstrations in farmers' fields; and publicising insect and pest control methods. When the schemes under the intensification of tobacco research gather momentum, I am sure these activities will also be expanded and intensified.

"On the publicity side some highly useful work has been done. In spite of the limited resources available for this work, the Committee produced 15 information pamphlets in Telugu, English, Hindi, Tamil, Gujarati and Oriya. It is now proposed to bring out, before the next season, pamphlets in English as well as in regional languages, giving a calendar of cultivation operations month-wise and type-wise. The quarterly journals issued by the Committee are also serving a very useful purpose. In addition, a comprehensive Tobacco Directory has been published which has been a success even from the commercial point of view.

"The position regarding tobacco acreage and production in the country has improved. The production in 1955-56 is estimated at 580.2 million lbs. from a total area of 921 thousand acres, as compared to 546.6 million lbs. from 846 thousand acres in 1954-55. Exports have also increased correspondingly. In 1955-56 these aggregated to 103.8 million lbs., valued at Rs. 140.2 million, as against the total of 88.8 million lbs., worth Rs. 128.9 million in 1954-55. Imports of both unmanufactured and manufactured tobacco have also increased. 3.9 million lbs. were imported during 1955-56, as against 3.2 million lbs. imported in the previous year.

"Of late, the disposal of higher grades of F. C. V. tobacco has presented a new difficulty. The United Kingdom, which has been the principal importer of these grades, did not lift as much stock in 1955-56 as she used to do in previous years. This created a slump in trade, and resulted in heavy accumulation of stocks. On account of greater availability of the Rhodesian tobacco and even of American tobacco for sterling, the U. K. may not purchase now as much of Indian tobacco as she used to do previously. It is necessary, therefore, that we should, on the one hand, explore other markets, and on the other, make determined efforts to improve the quality of our tobacco.

"Of late, some new markets have evinced interest in our tobacco. The Republic of China has been purchasing Indian tobacco in considerable quantities since 1954. The U.S.S.R. has also recently shown much interest in our tobacco. The *bidi* tobacco

delegation sent out by the Tobacco Export Promotion Council to look for markets in the West Asian and African countries for *bidi* tobacco has reported that there are good prospects for exports to Middle-East countries if packing is improved and prices are kept reasonably low to compete with the locally made cheap cigarettes. They also envisage good prospects for our Virginia and *Natu* tobacco in Egypt. I may, however, put in a word of caution here. In view of the unsettled and fluctuating conditions of foreign trade and the shifting national policies, it would be inexpedient to count on any country remaining a stable importer of our goods. We have constantly to be in touch with the market conditions in the importing countries, and have to keep wide awake to cater for external demand wherever it is to be discovered.

"In regard to the need for improving marketing conditions in the country I would only mention that most of the State Governments concerned have already initiated measures under the Commercial Crops Markets Act. It is expected that these would eliminate many of the evil features of the existing practices, and that the tobacco producers would get better returns for their produce. It is also expected that the State Warehousing Corporations, to be set up by the State Governments under the Agricultural Produce (Development and Warehousing) Corporations Act, 1956, would look into and solve the problems affecting tobacco storage prior to final marketing.

"The Tobacco Expert Committee appointed by the Government of India in the Ministry of Finance (Revenue Division) in January, 1956, to review generally the position regarding the assessment of duty on tobacco and to consider the methods adopted for estimating the produce of tobacco growers for purposes of accounting and assessment, has now almost concluded its labours, and is expected to submit its report shortly.

"With these preliminary observations, I shall now request Dr. Panjabrao Deshmukh, Minister for Agriculture, to inaugurate the meeting."



Dr. Panjabrao S. Deshmukh, Union Minister for Agriculture inaugurating the 19th Meeting of the Indian Central Tobacco Committee at Bangalore on 30th January 1957. (From left to right) Dr. N. R. Bhat, Director, Tobacco Research; Dr. B. N. Uppal, Agricultural Commissioner with the Govt. of India and President of the Committee; Dr. M. S. Patel, Secretary and Sri M. A. Parikh, Vice-President of the Committee, 1957-58

Dr. Panjabrao S. Deshmukh, the Union Minister of Agriculture then addressed as follows:

"DR. UPPAL, AND FRIENDS,

1. "In spite of my desire to keep contact with the Commodity Committees which exist for various crops, I regret that it was not possible for me to address the members of the Indian Central Tobacco Committee so far. I had the pleasure of meeting some of you on the occasion of laying the foundation stone of the Central Tobacco Research Institute at Rajahmundry but I am surprised to find that even that event took place full two years ago. I, therefore, value this opportunity of coming into contact with you and to express before you some of my views and ideas on tobacco growing and the tobacco industry in the country.

2. "As this is not a commodity which sustains the body or is useful for human happiness in any of the ways like cotton or jute or foodgrains, it is nonetheless a commodity of very great importance not

only to the country as a whole and a large number of its growers and manufacturers but also because it is an important cash crop which brings us valuable foreign exchange. It was, therefore, correct that we should have a body like this Commodity Committee for the improvement and development of this commodity financed by a cess or duty. It was also proper that this body should represent all the various interests connected with this commodity from the producer to the consumer as well as the traders and others. It has been invested with the responsibility of undertaking and promoting the improvement and development of tobacco.

3. "Our experience has shown that the appointment of such Commodity Committees has been quite a suitable method of dealing with national interests and considering the problems and difficulties of all those who depend so much on the progress made in growing and manufacturing a particular commodity. After all every commodity has its own problems peculiar to itself and it

is, therefore, proper that for the purpose of obtaining the maximum results in the shortest time it should be dealt with separately as well as comprehensively so as not to allow any of its aspects to be uncared for. I am fully conscious that there may be room for considerable improvement in its working and especially in expanding its extension aspects. But these are matters which we can always carefully consider and engage ourselves in ever-increasing efficiency and co-ordination.

4. "Tobacco in its different varieties and forms has proved to be a veritable gold mine for our Nation and Exchequer. It constitutes a sizeable portion of the total Union excise duties having contributed to the Union Exchequer about Rs. 35.6 crores during the last year. Tobacco is rightly called "golden weed" as it gives to its producer every year on an average 32.4 crores of rupees. Its industry has opened out unending avenues of employment to thousands of people. The Planning Commission have therefore appropriately allotted a place for tobacco in the Second Five-Year Plan. Under this, it is proposed to adequately equip our Central Research Institute and main Research Stations.

5. "Provision has also been made for extension service in the main tobacco growing areas. Extension Schemes are already in operation in the Virginia growing tracts of Andhra Pradesh and the Government of India are considering the initiation of tobacco extension programmes in other tracts of the country. Our production from land is low. We should, however, remember that it is not the quantitative yield that matters much these days but it is the quality of tobacco on which the buyers place the greatest importance. Maximising crop production and improvement of quality are to be brought about by adopting sound farming techniques and bringing into practice all technological potentialities.

6. "From your President's speech, it is evident that the Committee's Research Institute and its feeder stations have, with the limited facilities available, brought about certain quick results which, if adopted in the farmers farm will increase both the quality and the quantity of produce with-

out increasing the crop areas. Discovery of fresh facts and techniques perfected in laboratories are of no consequence if these are not brought to the fields of the farmer and made available to him in a form in which he can assimilate them for economic utilisation.

7. "I am glad that your Committee has now fully realised this necessity and has already published several publications including a few popular leaflets on the improved techniques of tobacco cultivation and curing in regional languages and Hindi. I am glad also to see the improvement in its get-up and style. Any expenditure incurred on the publication activities which bridge the gulf separating the scientist in the laboratory from the practical farmer in the field is fully worthwhile and no sense of false economy should come in the way.

8. "The strategic importance of tobacco for the success of the Plan is further enhanced by virtue of its being an important exportable commodity and the necessity to step up its export is keenly felt now, as only through such means the foreign exchange needed to import essential industrial plants and machinery for the developmental projects can be secured. I am sure with the help, advice and cooperation of the best brains connected with this commodity, the Committee will be able to pave the way for a significant amelioration of the conditions of the tobacco industry.

9. "As I have already stated, my contacts with this Committee as also with tobacco growing or manufacture of tobacco have not been of the very intimate. All the same I might safely say that I am not completely ignorant of tobacco growing because although the acreage is negligible as compared to Andhra or Mysore, we do grow some tobacco not only in Berar but in my own village and in my own family. In my father's time we used to have one particular field where tobacco was grown almost regularly. I had also seen it stacked in my childhood, although I did not realise that it was such a valuable commodity. But ever since the time I left my village for further education and entered public life my contact with this commodity had diminished considerably till I took to smoking a few cigarettes a day some 30 years ago.

10. "I am mentioning this background because even without any very intimate contact with tobacco growing, tobacco trade or even this Committee, I have been instrumental in bringing about a profitable contract for sale of 2000 tons of tobacco to the Soviet Union as a result of my visit to that country a few months back. As a Minister in charge of Agriculture, I have had occasions to receive representations about the condition of tobacco growers, especially the fall in prices, lack of markets and accumulation of stocks which affect the growers very severely. But as a result of a deputation that waited on me sometime before I left for Russia, I had for the first time taken a direct interest in trying to help the tobacco growers in Andhra, by far the most important tobacco growing State in India, to dispose of their stocks, and I was happy to learn a couple of weeks ago in Delhi that it was as a result of personal contact that we were able to export to Russia the quantity already mentioned at prices which were fairly favourable. I did not have time to go into the details of this transaction nor would I have bothered you with the details even if I knew them.

11. "The only reason why I am mentioning all this is that if our growers are interested in trade on co-operative lines, they must forthwith organise themselves into a Co-operative Marketing Society so that wherever opportunity arises, the co-operatives may be able to deal directly with co-operatives in foreign countries and thus secure best possible prices for their produce. This, of course, is not the first time that I have made this suggestion, although so far I have made it only to certain important persons and not publicly. But I attach such importance to this matter that I would like you to pay your best possible attention to this.

12. "I think you already know that during the visit of a co-operative delegation led by me to the Soviet Union, the Central Consumers' Co-operative Organisation in that country told us that they would be glad to enter into trade agreements with similar co-operative organisations in other countries. Unfortunately, we have not had such an organisation established in India so far and, therefore, it was not possible for the

Centrosoyus, as it is called in Russia, to directly purchase the Andhra tobacco which we had offered to them. They have also told us that they cannot deal with us on cash basis but only on the basis of a barter. However, I can safely say that they are prepared to give us any goods that we may require. For the time being, by their letter, dated the 26th December, 1956, to our representative in Embassy of India in Moscow, they have offered us bicycles, watches, cameras, fountain-pens, radio sets, galvanised and aluminium utensils, electric goods, kettles, stoves, knives, forks and spoons made of rust-proof steel, separators, milk flasks and other industrial goods. If we are in a position to deal with this organisation on the basis they want, it may not be difficult to ask them to send us such other goods as we may require, e.g. small tractors or steel or corrugated iron sheets or cement etc. I was glad to listen to the speech of the Chairman in which he has summarised the position of tobacco growing industry almost upto date. I have therefore great pleasure in inaugurating this meeting."

"I thank you very much for giving me this opportunity to be with you and I wish the Committee and your deliberations all success."

Those present in the Hall then observed two minutes' silence to mark the significance of the Martyrs' Day.

Committee's Decisions

The Committee besides passing its Budget for next year, adopting the progress reports and approving the programme of work of its Central Research Institute and Stations, recommended to the Government of India certain changes in its membership consequent on the reorganisation of States, sanctioned the extension of the scheme for the study of physical and chemical characters of bidi tobacco and exploratory research scheme on cigarette tobacco in U. P., adopted the proposal for soil survey of the F.C.V. tobacco growing areas in Andhra Pradesh, sanctioned a research scheme on bidi and chewing types of tobacco in Orissa, a scheme for cytological studies in Indian types of *Nicotiana tabacum* and *Rustica*

and schemes for investigation of the control of the root parasite *Orabanche* and for control of leaf burn of tobacco in Kaira District of Bombay State. The Committee also decided to start a Gujarati Journal to cater to the needs of the bidi growing areas of Bombay State and sanctioned a statistical survey scheme in one centre in Guntur District and approved the extension of the scheme for exploratory marketing centre at Bhagwanpur in Bihar. The Committee recommended to the Government of India the inclusion of tobacco in the list of commodities under the Agricultural Produce (Development & Warehousing) Corporations Act, 1956 and inclusion of the tobacco

industry except cigarette manufacture in the list of recognised cottage industries. The Committee also decided certain administrative and financial matters relating to its activities and elected its various Sub-Committees for the next year. It also decided to form a high-power Sub-Committee to recommend the future pattern of administrative and financial control of the Committee's Research Stations and Schemes. A Planning Sub-Committee was also constituted.

Sri Mohanlal A. Parikh was elected unanimously as the Committee's Vice-President for 1957-58.

INDIAN FLUE-CURED VIRGINIA TOBACCO

(MEASURES TO PROMOTE YIELD AND QUALITY)

BY

N. R. BHAT

(Dr. N. R. Bhat, Director of Tobacco Research, Indian Central Tobacco Committee was deputed to visit Southern Rhodesia, to study the methods of production of flue-cured tobacco with a view to introducing these to the extent possible under Indian conditions for improving the quality of Indian Cigarette tobacco. He left for Southern Rhodesia on 13-2-1956 and returned on 22-3-1956. The measures suggested by him as a result of his trip, on the aspects of promotion, through research and extension of yield and quality of Indian flue-cured Virginia tobacco are given below.)

The problems requiring to be tackled through research for promotion of yield and quality, more particularly quality, in Indian flue-cured Virginia tobacco, are the following:—

1. A drastic change in cultural methods.
2. Growing of quality varieties.
3. Use of fertilisers including more P_2O_5 and K_2O .
4. Topping.
5. Rotation.
6. Elimination of cultivation in saline areas of Andhra State, and extension of the same in lighter soils.
7. Extension of improved methods.

My suggestions on the problems are discussed below:

1. A drastic change in cultural methods.

Several experiments have been conducted at both the Central Tobacco Research Institute, Rajahmundry and its Sub-station at Guntur, in respect of fertilisation of the crop with N, P and K, and the time and method of fertiliser application, for several seasons. While there has been a limited response only to about 20 lbs. N in certain types of fields (which are probably deficient in a capacity for nitrogen recuperation), no response to P or K in respect of yield and quality as judged normally by trade characters has been observed in any of the experiments. Even the growth difference observed in any of the experiments. Even the growth difference observed, only during this season, in favour of P_2O_5 (in combination with N) treated crop in the initial stages was evened out later on and this crop did not show any advantages over crop treated with only N in yield, colour, body

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or burning quality of the leaf. In the case of the Rhodesian crop it was seen that there was good response of the crop in yield and also quality to application of even high doses of P_2O_5 . In fact, increases in yields of quality leaf above a certain limit are said to be realised more through P rather than N (N is permitted to be applied by the grower in small quantities, i.e., from 4 to 40 lbs. per acre on the basis of his experience). The burning quality is said to improve with the application of potash; topping was seen to be very effective in improving yield and body of the leaf. A clear difference was noticeable in respect of the root system which in the Rhodesian crop consisted of a very large number of fibrous roots, while the Indian crop usually has mainly 2/3 tap roots and just a few fibrous roots. This difference was reflected in far better size and body of the Rhodesian tobacco. The average length of the Rhodesian leaf (cured) was said to be 18 inches to 20 inches while that of the Indian leaf is approximately 12 inches to 18 inches. The number of leaves per lb. of the Rhodesian crop are said to be about 50 to 60, while those of Indian crop, as estimated at the Institute, are about 115. It is therefore felt that a good development of the root system is the first essential for a good crop. Since it was also observed that any amount of manipulation in curing did not substantially improve the quality of a badly raised crop, it would mean that for producing good quality leaf one has to look primarily for a well grown crop which in turn would depend upon the development of a good root system.

(2) For securing a good root system, the sandy soils in Rhodesia are naturally helpful. In addition, the soil is ploughed deep (subsoiling is also done in certain cases), plenty of humus is incorporated through suitable grass rotations, and planting is done on broad high ridges.

(3) In the Andhra Pradesh, the soils are clayey and heavy and, as such, are not conducive to good root development. It is, therefore, though essential to conduct experiments involving the loosening of the soil by tractor ploughing and incorporation of cheap humus of the sort of paddy husk, chopped tobacco stalks and by grass green manuring.

(4) The Rhodesian crop is raised during the rainy season as a result of which satisfactory amount of moisture is available in the soil for utilisation of fertilisers by the crop. This is probably one of the reasons why there is good response to the high doses of P_2O_5 (up to 400 lbs. per acre in some cases).

(5) In the Andhra Pradesh the crop is grown on conserved moisture almost at the termination of the monsoon, since it is not possible to grow the crop during the monsoon in such soils. It is, therefore, very essential that, firstly, as much moisture as possible is conserved and, secondly, as least of it as possible is allowed to be lost through evaporation, etc.

(6) While it is thought that for both better moisture conservation and retention, incorporation of the humus as suggested above would be helpful, the need is thought also of providing a mulch after about the first intercropping.

(7) The measures suggested in paragraphs (2) to (6) above may work more satisfactorily in the case of Mysore where natural soil and seasonal conditions are to a certain extent like those in Rhodesia. But no opinion can be given in either case till indications are obtained through experiments.

(8) To ascertain the above viewpoints I have already initiated experiments at Rajahmundry and Guntur, and have also suggested similar experiments to the Mysore Tobacco Co., Ltd., Bangalore City, during my visit there in the first week of May 1956, for being undertaken in as many different places as possible during the current season. These experiments will have to run for at least a couple of years before suitable measures could be tried on growers' fields to obtain definite results. There will be no special financial requirements during the period of experimentation on the research farms.

2. Growing of quality varieties

3. Use of fertilisers including more P_2O_5 and K_2O .

4. Topping.

(9) The possibility of growing newer varieties for quality, complete fertilisers

and topping, for getting better quality (and yield), depend entirely on the success achieved in tackling problem No. 1 "A drastic change in cultural methods", in an effective manner. However, in the experiments mentioned as having been taken up at Rajahmundry and Guntur and suggested to be taken in Mysore, treatments of P_2O_5 and K_2O , and topping have been incorporated.

5. Rotation.

(10) In East and West Godavari districts, tobacco is being grown without rotation for 15 to 12 years. It is being felt that due to this practice, the size, body and other qualities of the leaf have been deteriorating. In other parts of Andhra Pradesh, the main rotation system is groundnut-sorghum in the first year and fallow-tobacco in the second year. It is not known whether this is the best rotation.

(11) It may be possible to fix suitable rotations after conducting experiments. For this reason, new rotational experiments including 8 to 10 crops possible to be grown in each region, have been initiated both at Rajahmundry and Guntur during the current season. In these experiments, chillies with normal and less manuring have been included; as there is an impression that tobacco following chillies has a tendency to grow green and coarse. I may add, that there are no special financial requirements for these experiments. For getting results which could be tried on a large scale in growers' fields, 4 to 5 years' experimentation on the research stations will be necessary.

6. Elimination of cultivation in saline areas of Andhra Pradesh, and extension of same in lighter soils.

(12) Virginia tobacco cultivation needs to be discouraged in saline areas in Andhra State as the produce is very poor in burning and other quality characters. On the other hand its cultivation deserves to be encouraged in lighter soils with suitable climatic conditions such as those prevailing in Mysore State, as there it is expected to grow tobacco of better quality.

(13) For the above purpose propaganda will be made not to grow flue-cured tobacco

in areas which will be found to be saline, on the basis of the findings of the scheme for survey of Saline Soils which is in operation.

(14) Further, the areas which are found to be saline and therefore unsuitable for cultivation of flue-cured tobacco in Andhra Pradesh, will be brought to the notice of the Government for taking necessary action.

(15) I have stated in paragraphs (7) and (8) above that the Mysore State enjoys better congenial conditions for the growth of better quality flue-cured Virginia tobacco, and what steps have already been taken to try out some of the new cultural methods. Further, for extension of cultivation Virginia tobacco, a new Research Station has been sanctioned to be opened in the Mysore State, which will be established to give help and advice to the cultivators from the findings of research. If the trials give favourable results, the area under this type of tobacco would be increased which will make up the reduction that would take place by the elimination of saline areas in the Andhra Pradesh.

7. Extension of improved methods.

(16) It is, in general, experienced that the leaf is badly handled and cured by the growers. Training, demonstration and propaganda in better cultivation, curing and processing, would help the growers, in producing better quality tobacco.

(17) With this end in view, a scheme for training has been initiated at the Central Tobacco Research Institute for giving training to growers, field staff of the Market Committees, National Extension Services and Community Development Projects, in respect of better methods of raising nurseries, cultivation, harvest, handling, curing, bulking and grading, under the Second Five-Year Plan.

(18) For demonstration and propaganda of the above, trained Tobacco Extension Staff has been working since last year in the Guntur district. A similar scheme for extension work has also been sanctioned by the Government of India for East, West Godavari and Kistna districts.

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CULTIVATION OF HOOKAH TOBACCO

(NICOTIANA RUSTICA L.)

IN KAMPIL AREA OF U.P.

BY

P. S. GUPTA & T. N. SHUKLA

In a previous article* we have discussed in brief the cultivation of *Hookah* tobacco in Kannauj range of Farrukhabad district. In the following pages, a brief account of the cultivation of *Hookah* tobacco in Kaimganj and Kampil areas of the same district is given. In this area winter crop is more important while in Kannauj summer crop is important.

Kampila tobacco is well known in *Hookah* tobacco trade. This type of tobacco is produced in Kaimganj and Kampil areas of Farrukhabad district—the most important area for tobacco cultivation in U. P. Because of its commercial importance it was thought necessary to survey the method of cultivation and curing in this area for the benefit of those who want to produce pungent and high yielding *Hookah* tobacco. A number of cultivators were interviewed on the spot regarding all the aspects of tobacco cultivation and curing as practised in Kaimganj and Kampil areas. The crop was also inspected (by the junior author) to get fuller details.

Varieties:—N. Rustica is the predominant variety. The tobacco grown in this area is known as Kampila. Two varieties depending on the size of plant and leaves are recognised.

1. Lakra-Tall Plant with smaller leaves.
2. Baunia-smaller plant with bigger leaves.

Soil & Rainfall:—Tobacco is grown in soils ranging from sandy loan to *Domal*. Every effort is made to grow tobacco in the closest vicinity of the villages (locally called as 'Gohan' land) which is very fertile as the nightsoil of the inhabitants serves as an excellent source of nitrogenous manure—so much required for the better growth of *Hookah* tobacco. Sites of ruined buildings are also preferred for its cultivation.

Annual rainfall is about 35 inches.

Crops:—In Kaimganj proper two crops are taken annually whereas in Kampil only first crop is taken. N. Rustica is the predominant variety.

First or Winter Crop:—(Locally called *Mahu*). Nursery is sown in the end of August (second fortnight of Bhadon) and the transplanting continues from October to November. Harvesting is done in March/April.

Second or Summer Crop:—(Locally called *Dhakka*). Nursery is sown in November and transplanting continues from the end of December to January. Harvesting is done in April.

* Gupta, P. S., Shukla, T. N., and Singh Iqbal—"Cultivation of *Hookah* tobacco (N. *rustica* L.) in Kannauj range of Uttar Pradesh—A survey published in *INDIAN TOBACCO*, Vol. VI, No. 2."

Rotation:—It is dependent on the type of crop taken.

For the first crop

- (1) Fallow—Tobacco
- (2) Maize—Tobacco

For the second crop

Maize—Early Potato (harvested in December)—Tobacco.

This crop matures 2 to 3 weeks later than the first crop.

Since the cultural operations for both the crops are almost the same only a general account is presented below.

Nursery:—Preparation of land starts as soon as the field becomes free after the harvest of the Maize crop. Four to 5 ploughings followed by pataing are given to get a good tilth. The field is cleaned of weeds and other trash and levelled. Small beds of 10 ft.—12 ft. x 8 ft.—10 ft. size are made. This is by estimation and not by actual measurement so the size may differ from cultivator to cultivator and from bed to bed in the same field. Soil of each bed is well pulverised with the help of 'Khurpi'. The beds are made slightly sloping to avoid water logging. Ten to 15 seers of well rotten Farm Yard Manure or about 4 chhataks of Ammonium Sulphate is applied per bed. About one 'Tola' of tobacco seed either alone or mixed with ash to make it bulky for easy handling is sown in each bed, by sprinkling, and the bed is made compact by pressing with the help of feet or hands. Germination takes place in 8—10 days, time. Three to 4 irrigations and weedings are needed. Nursery is locally called 'Gairr' or 'Paudh'. Intercultural operations are done by entering the beds.

Preparation of Land:—Every effort is made to make the fields well pulverised, clean of trash and with an excellent tilth by a number of ploughing and pataing.

Transplantation:—Seedlings become available for transplanting in October. Four to 6 leaf stage is considered to be the best age for this purpose. The size of transplantation beds is almost the same as that of the nursery beds. Single healthy seedlings

are put in a slit made with the help of a 'Khurpi'. The distance from row to row and plant to plant is the same which varies from 1½ ft. to 2 ft.

Transplanting continues from morning till evening followed by immediate medium flood irrigation. After that no other operation is done till about a fortnight when the second irrigation is given. As soon as the field becomes fit for intercultural operations weeding and hoeing about 4 to 5 inches deep is done. Lower leaves are also removed.

Manuring:—About 350—500 mds. of Farm Yard Manure is applied per acre. The most important manure is 'Nona' (Saltpetre) and is applied very heavily depending on the resources of the cultivator. The cultivators are unable to tell the exact amount applied. On further inquiry they informed that it may be about 200 mds. per acre which is a rough figure. Ammonium Sulphate is also applied at the rate of about 5 bags (about 13½ mds.). It appears that the success of a crop depends on the quantity of 'Nona' applied which is available in plenty from the ruins of old buildings.

Irrigation:—The source of irrigation is well and the water of most of them is not brackish. From January till the harvest of the crop irrigation is given as frequently as the fields require. In all about 10—15 irrigations are given during the whole season. It is a very important item. Intercultural operations such as weedings and hoeings are done from time to time.

Suckering and Topping:—Removal of suckers starts about one and a half month after transplanting and continues wherever the necessity of removal arises—say 4—5 times in the whole season. Topping is done at 12—13 leaf stage.

Harvesting and Curing:—Harvesting is done in March/April. Whole plants are harvested at the ground level with the help of a 'Khurpi'. In some cases immediate separation of leaves and stalks is done while in others separation is done next day. In the evening the leaves are heaped together and spread early in the morning when slightly soft. Attempt is made to avoid the wetting of leaves by dew. The process of

turning over of leaves is continued for about 12—15 days. After that the leaves are heaped, a slight sprinkling of water is given and left in the field for 3—4 days more and covered with bags or cloth to keep them warm and to avoid direct exposure to wind. Heaps are opened and turned over and reheaped. All this is done in night or before sunrise. After that it is carried to godowns and reheaped there. 3 to 4 days after the heaps are turned over in shade and reheaped. This process takes place in close godowns to avoid direct exposure to sun and wind so that tobacco may not lose its weight further.

Four to 5 cured leaves are tied together and are locally called as 'Gairas' (hanks). A large number of 'Gairas' are put in a heap by pressing with feet and such heaps are locally called as 'Chakkas'. The quantity of tobacco kept in a 'Chakka' varies from 10 mds. to 100 mds., depending on the availability of tobacco. 'Chakkas' are also

turned over from time to time till sold to avoid heat production. Tobacco which is not used in making 'Gairas' is kept in a heap called 'Ganj' which contains inferior grade tobacco also. 'Garia' tobacco is of a superior quality and fetches higher price in comparison to 'Ganj' tobacco. 'Gairas' are packed in gunny bag bundles of 4 standard mds., for transport purposes.

Stalks are left in the fields in small heaps at places and allowed to dry as such and then chaffed. Sometimes these are chaffed green and then allowed to dry. It is easier to cut the green stalks but the cultivators inform that by this method the weight of stalks is reduced as the stalks become completely dry. The whole curing process takes about 25—30 days.

Economics:—A comparative statement regarding the yield and cost of cultivation per acre and selling price of tobacco grown in Kaimganj and Kampil areas as stated by the grower-curer is given below:—

Details.	Kampil.		Kaimganj.	
	Rs.		Rs.	
Yield per acre	...	25 to 30 mds. (leaf) 8 to 10 „ (stalk)	40 to 60 mds. 16 to 20 „	
Price	...	25 to 50 p. md. (C. Leaf) 13 to 16 „ (dried st.)	40 to 60 p. md. 16 to 20 „	} Exclusive of Excise duty.
Gross gain per acre	...	625 to 1,500 (leaf) 104 to 160 (stalk)	1,600 to 3,600 256 to 400	
Total income	...	729 to 1,660	1,856 to 4,000	
Cost of cultivation (per acre)	...	500 to 800	1,000 to 1,500	
Net profit (per acre)	...	229 to 860	856 to 2,500	

The wide range in net profit per acre is due to the following facts:—

(1) The figures are based on the memory of cultivators.

(2) The prices of tobacco vary greatly due to variation in pungency of the final product viz., more the pungency in tobacco better the price it will fetch. Also the individuality of the cultivator to produce

and present the final product to the market, well-cured pays him more than his fellow-men.

(3) The price of tobacco varies from year to year.

(4) The yield per acre which varies from cultivator to cultivator is most important. It is needless to emphasize that better the yields of cured tobacco per acre more the profits.

LABORATORY TECHNIQUE FOR LEAF BURN TESTS OF FLUE-CURED VIRGINIA TOBACCO

Leaf burn, the property of the leaf to continue to burn or glow when ignited in a small area at the threshold temperature of combustion, is the most important characteristic of a smoking tobacco. This property varies considerably from leaf to leaf, and between various portions of the same leaf even in the same sample. It is influenced by the physical, and chemical characteristics and moisture content of the leaf. The method of quantitative estimation of leaf burn has been devised by Johnson 1,2 in cigar tobacco. But, the method remains to be tested in flue-cured Virginia tobacco. Further, the appropriate sample size is to be determined and the technique for ensuring uniform and optimum moisture in the leaf to be tested is to be standardised. Methods developed by the authors for the above purpose are reported below.

Moisture content during leaf burn tests:—
The tests were conducted with strips from 6 different portions of the leaf—base, middle, and tip of the lamina on either side of the midrib. Studies made with different chemicals for bringing them to uniform, optimum moisture content, indicated that magnesium nitrate was very suitable for the purpose. It was found that, in spite of initial variation, the strips attained a uniform moisture content (10.5 to 10.7 per cent) when kept in a desiccator over a saturated solution of the chemical for 72 hours. The data of the tests conducted are given in the following table.

Percentage of Moisture at Different Intervals of Time

Sample No.	Time in hours				
	0	24	48	72	96
I	12.10	10.92	10.76	10.72	10.71
II	19.67	17.30	12.23	10.54	10.58
III	24.62	17.00	12.57	10.63	10.62

Sample size:—For determining the appropriate sample size, 16 samples of flue-cured Virginia tobacco (*N. Tabacum* var. *Harrison Special*) collected from villages in the Andhra Pradesh were tested. The data indicated that the tip and middle portions of the leaf had significantly better burn than the bottom, while there was no significant difference in the burn of right and left halves. From the analysis of variance of data of leaf burn of 10 leaves from each of these 16 samples, it was found that the sample size which would limit the experimental error to 5 per cent was of 8.7 leaves. Ten leaves may, therefore, be considered to constitute a satisfactory sample.

The authors are thankful to Dr. N. R. Bhat, Director, Tobacco Research for giving necessary facilities and to Sri V. N. Murthy, Statistician for the statistical interpretation of the data.

K. V. VENKATARAMAN
K. G. TEJWANI

CENTRAL TOBACCO RESEARCH
INSTITUTE, RAJAHMUNDRY.

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CONTROL

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Control in Seed-Beds

Infection in seed-beds usually comes from one of the two sources, the seed or the soil. Of these, the seed is undoubtedly the most common and important source. Seed treatment is therefore necessary to ensure against introduction of disease into the beds of seed.

It is highly advisable, as a precautionary measure, that new seed-beds be made up each year. It is a good practice to sterilize the beds in order to minimize the chance of infection from material containing the organisms which may have remained in the beds.

The chief measure of control is the use of disease-free seed. Disease-free seed may be obtained from fields entirely free from either disease or by treatment which will destroy the bacteria without injury to the seed. Even though the seed is thought to be free from disease, treatment is desirable as an extra precaution. Treatment is very simple. The seed should be soaked for fifteen minutes in a solution of Formaldehyde. The solution is made by adding one ounce of forty per cent Formaldehyde to one pint of water. Bordeaux mixture, either as a dust or spray, is found very effective to control disease in seed-beds. It is recommended that beds be sprayed or dusted weekly, from the time the plants are about an inch tall until setting is completed.

Control in Fields

White Rust:—White rust takes its common name from the whitish appearance in small patches on the leaves and spreads very rapidly. This is generally worse in the season of heavy rainfall, which renders it difficult to prevent. White rust usually starts on the lower leaves which are shaded and near to the moist soil. High pruning, i.e. removing several of the lower leaves, assist in keeping the disease in check as this allows a current of air beneath the leaves of the plants, and helps to prevent excessive moisture on the surface soil and the lower leaves.

Tobacco Wilt:—This can cause considerable damage to the crop. The best remedy for Tobacco Wilt is crop rotation. The organisms which cause the disease remain

in the soil for several years. Crop rotations, where this disease occurs, should be so arranged that tobacco is grown in the rotation only once or twice in five years. Besides tobacco, the disease can attack other plants, such as potatoes, tomatoes, chillies, etc., and should, therefore, be avoided in selecting crops to be grown in the rotation system.

Root Rot:—This disease attacks the root system and causes decay of the roots, which results in stunted growth of the plants. Rotation of crops that are not attacked by the organism which causes Root Rot is advisable. Maize, wheat, oats and grass may be grown in rotation.

The condensed recommendations for control are as follows:—

1. Save seed from disease-free plants.
2. Sterilize seed.
3. Change the location of the seed-beds if possible and sterilize the seed-beds.

4. Dust or spray beds with Fungicide, weekly, until setting is completed.
5. Water beds only sufficiently to keep plants growing and ventilate thoroughly.
6. If diseased plants are found in the field, remove and destroy them immediately.
7. If infection in the field is light or occurs late in the season, pick and destroy diseased leaves when they are not wet from dew or rain.
8. As far as possible, avoid working in the tobacco when leaves are wet.
9. Remove lower leaves which are shaded and near the moist soil to allow free current of air.
10. Rotate other suitable crops where diseases like Tobacco wilt and Root Rot occur.
11. Select virgin soil to ensure a disease-free crop.

ERRATA

In the article "Chemical Evaluation of Burning Quality in Cheroot Tobacco" appearing on p. 184 in INDIAN TOBACCO Vol. VI No. 4:

for $\frac{KO+CaO}{MgO+N+Cl}$ read $\frac{K_2O+CaO}{MgO+N+Cl}$

and

for $\frac{K_2O}{M+Cl}$ read $\frac{K_2O}{N+Cl}$

TOBACCO SEED PRODUCTION

SEMINAR AT THE CENTRAL TOBACCO RESEARCH INSTITUTE, RAJAHMUNDRY

A Seminar on seed production in tobacco was held on 7th November, '56 when Dr. N. S. Reddy, Officer-in-charge of the Experimental Department, Indian Leaf Tobacco Development Co., Ltd., Rajahmundry, gave an account of the method as followed by the Company. Dr. N. R. Bhat, Director, Tobacco Research, presided. In his introductory remarks, Dr. Bhat spoke about the excellent work done by the Company in introducing and spreading the cultivation of flue-cured to Virginia tobacco in India, more particularly in Andhra Pradesh. He said that pure seed production and distribution was taken up by the Company in order to ensure that the produce was of a uniform and good quality.

Dr. Reddy traced the origin of the Harrison Special variety which was under cultivation in the country, and described the procedure the Company was following

1st year:

2nd year:

3rd year and subsequent years:

Final year:

for seed supply. He stated that till 1928 seed used to be annually imported from U.S.A. as there was a feeling that there was a gradual deterioration in the imported seed in a few years. The importation stopped when an embargo was placed on the export of seed from U.S.A. in 1936. Since then the Company was multiplying seed here only according to a well thought out plan, and was distributing to growers. He felt that the impression that the imported seed deteriorated might not have been correct, and if any deterioration had really been observed, it might have been caused by the initial variability in the variety coupled with lack of selection, natural cross pollination with any of the country types, or by mutations.

Dr. Reddy described in detail the procedure employed in the plant-to-row technique which was being followed in seed production, which was as below:—

Bulk crop of variety to be improved.

One acre.

Select best thirty plants.

Select best families and out of these best thirty plants.

Repeat trial as in second year.

Select best families and out of these best thirty plants.

Mix all thirty plants to serve as nucleus seed for seed multiplication.

In selecting plants for selfing for seed production important field characters of the plant and the leaf, ease in curing, and characters of flue-cured leaf such as colour and its retention, ratio of cured to green weight, texture, body, elasticity, flavour and burning quality, etc., were being considered.

He described further the precautions that were being taken and the treatments that were given for preventing mixtures, insect and fungal attack, loss of viability due to high amount of moisture in storage, etc.

Discussion took place on the method followed in testing germinability of the seed, how long the stored seed was thought suitable for distribution, etc.

In his concluding remarks, Dr. Bhat observed that too much emphasis on the purity of the variety may not be necessary. He felt that the deterioration suspected in the Harrison Special soon after its introduction might probably have been real, and might have been due to the lack of liability for adaptation in the purified variety. He remarked that an improved variety could be maintained at its best with the optimum hybridity resulting in the system of breed-

ing prevailing under the conditions of general cultivation. There was experimental evidence that in the case of Virginia variety of tobacco, there was more than 5 per cent. natural cross-pollination. For this reason there was reason to believe that continuous selfing over a period of years may bring about certain amount of deterioration and lack of adaptability in an over-purified variety. It may also result in somewhat more non-uniformity of leaf in each plant. In his opinion, therefore, it was desirable to have a broad-based, pure foundation stock within which the plants would be allowed to interbreed, strictly eliminating the undesirable plants in every stage of multiplication. Since the multiplication factor in tobacco is as high as about 20,000, most of the area could be supplied with pure seed in only two to three stages of multiplication.

After the Seminar, Dr. Reddy showed two interesting films depicting the various phases of production and processing of flue-cured tobacco, and multiplication and processing of seed.

The meeting concluded with a vote of thanks by the Agronomist.

SOVIET TOBACCO

BY

E. YERMOLENKO AND S. MOSTOV

Soviet brands of tobacco are popular on foreign markets because the USSR is in a position to export high quality goods, thanks to advanced methods of cultivation and working out of tobacco.

It is a notable fact that exceptionally great uniformity of botanical composition in commercial consignments is a distinguishing feature of Soviet tobacco. This is the result of a system under which tobacco brands are strictly distributed in the different districts of cultivation according to the botanical varieties and the collective farms (which are at present the only tobacco producers in the USSR) are regularly supplied with uniform seeds of thoroughly tested brands, developed in the All-Union Institute of Tobacco. Vast stretches of tobacco fields are planted to tobacco of the same brand and the same botanical variety. The positive results of this are quite evident.

The USSR exports tobacco that is technically fully ripe—this another important fact ensuring its popularity on foreign markets. Good smoking qualities and uniformity of colour are thus achieved. Soviet tobacco does not as a rule contain any unripe leaves because it is harvested at the proper time.

The use of rational methods of drying also has a great influence on the quality of the tobacco. The standard set by the state and the rules of tobacco cultivation in the USSR provide for strict regulation of the drying process. Aromatic tobacco for instance, must be dried in the sun, while

“semi-drying” and “Pipe-flame drying” are the methods used for skeleton tobacco. The high technical standard of the tobacco drying plants eliminates all chances of the damage or deterioration which used to occur when tobacco was produced by small farms.

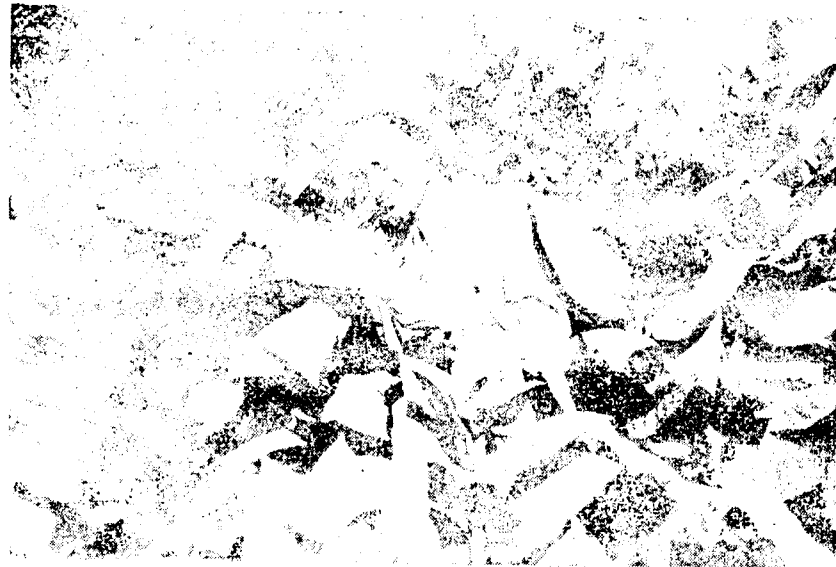
Fermentation is an important feature of the tobacco treating process and a major factor in the formation of tobacco qualities. Fermentation improves the taste, aroma and combustible properties of tobacco, as well as its physical and technological qualities, and makes it more resistant to long storage.

In the USSR great attention is paid to the fermentation of tobacco. As a result of research conducted by Soviet scientists, rational methods of fermentation in plants have been developed, thanks to which the process can be accomplished regardless of climatic or meteorological conditions and all the tobacco placed on the market at the proper time after it has been sufficiently fermented.

Tobacco factories can make the most effective use of their raw material if it is sorted in strict accordance with its actual quality. The commercial classification of Soviet brands of tobacco therefore provides for two main indices: “quality,” and “ripeness” of the tobacco leaf. Raw goods are sorted according to outward features. “Quality” is determined by the shape, size, and density and partly by the colour of the leaf and “ripeness” by its colour, density and elasticity.

Secondary signs of the quality of raw tobacco are naturally also taken into consideration in sorting: signs of damage from disease or field and warehouse pests, as well as mechanical injuries to the leaf. First quality brands are composed entirely of ripe, well fermented and adequately dried leaves of upper and average quality. These brands of tobacco are the richest as regards content and have the best correlation of

chemical elements that determine the smoking qualities of tobacco. This refers in the first place to carbo-hydrates (and their correlation to nitrogen), volatile oils, pitches and nicotine. Lower brands consist of leaves of a lower quality, picked in a state of incomplete technical ripeness, or, on the contrary, over-ripe. These brands also include leaves of a higher quality with defects acquired in picking, drying or fermentation.



Collective Farmer V. Agrba, examining ripe tobacco. Akhali-Sopeli Village, Abkhazian A.S.S.R.

Tobacco is a heat-loving plant, extremely sensitive to changes in the conditions of growth. Climate, soil and the methods of cultivation determine the type of tobacco as well as its commercial qualities. That is why the Soviet state standards for tobacco (which in the USSR have the force of a law) provide, in the first place, for the geographic distribution of the various types of tobacco, as well as for methods of cultivation, drying, etc.

The best brands of export tobacco are produced in the foot-hill and mountain districts of the Caucasian and Crimean coast of the Black Sea and in the dry, subtropical districts of the Soviet Union: in Kirghizia, Uzbekistan and Kazakhstan. The production of aromatic brands of tobacco that have acquired world renown is

centred in those areas. Highly flavoured and skeleton tobacco varieties — the best material for the manufacture of cigarettes, are cultivated in the districts of Georgia and of Krasnodar territory that lie at a distance from the sea.

Soviet standards provide for diverse methods of treating dried and fermented tobacco. The most generally used in the method known in the foreign trade vocabulary as "yarma" or "Cirapostal."

Some kinds of tobacco, Sukhumi tobacco, for instance, are treated by twisting, a method known on the market as "disy." Lower brands are treated by simpler methods, including one that is often used, known in foreign trade as "postal."

The system of packing tobacco according to USSR standards has several advantages

in comparison with those applied in other countries, the chief one being uniformity of the goods in a pack. Every pack consists of tobacco of one commercial brand only, of the same botanical variety, grown by the same method (in dry soil or irrigated), dried by the same method (flame, sun or semi-drying) consisting of the same quality leaves (the inclusion of two adjacent qualities in the same pack is permitted

only as an exception, for instance: superior and sub-superior), of equal colour and treated by the same method. Using other brands of tobacco than that contained in the pack to cover the top or bottom of it is not permitted. The inclusion of leaves of lower brands is permitted only in quantities that are insignificant for that given method of treatment.



Picking tobacco on the Stalin State Farm, Rakoshino Village, Mukachev District, Transcarpathian Region.

As regards type, smoking qualities and industrial production Soviet tobaccos are divided into aromatic, high flavoured and skeleton varieties. Aromatic varieties include: (a) Sukhumi tobacco, grown in the Abkhazian and Adjar autonomous republics and tobacco of the same type produced in Armenia and in Krasnodar territory; (b) Yalta tobacco, mainly grown on the South coast of the Crimea and tobacco of the same type grown in the Kirghiz, Uzbek and Kazakh SSR and (c) Crimean tobacco, grown on the South coast of the Crimea.

The production of high flavoured tobacco is at present limited to the districts of the Krasnodar territory and Georgian SSR adjoining Sochi. High quality skeleton

tobacco is grown in the Kuban and Maikop districts of Krasnodar territory, in some districts of Georgia, Armenia, the Crimean region, Kirghizia, Uzbekistan and Kazakhstan.

Sukhumi tobacco is the best known and most popular on the world market. The best brands of aromatic tobacco in the world are produced in the Sukhumi, Gudauty, Gagry, Gulripsha and Ochamechiry districts of the Abkhazian ASSR. Thanks to the subtropical climate and to sun drying the tobacco produced here is fully ripe and fermented until the complete desintegration of chlorophyll. The chief quality of Sukhumi tobacco is a fine but well defined aroma, rightly considered as unparalleled. The

combustibility of Sukhumi tobacco may be considered as ideal. It discloses to the full all the qualities of these tobacco brands.

Yalta or Crimean tobacco also occupies a prominent place in the group of Soviet aromatic tobacco brands. Yalta varieties also belong to the best aromatic brands. Aside from their strong, pleasant aroma, they have the quality of containing very little nicotine (from 1 to 2 per cent), so that their physiological strength is negligible.

A long period of vegetation, a limited quantity of atmospheric moisture, high temperature of air and great number of sunny days—such is the brief characteristic of the climate in the area where Yalta tobacco is grown. Under these conditions the local salty, marshy and loamy soils containing little humus, and the red and clay soils with a considerable admixture of shingle and lime produce tobacco with small leaves of pretty, light orange-yellow tints. The tissue of the Yalta tobacco leaf is soft and dense.

Drying tobacco at the Rustaveli Collective Farm, Sukhumi District, Abkhazian ASSR

The tobacco known on the outside market as "Crimean" is no less valuable. It is produced in the same tobacco growing areas as "Yalta" tobacco, but differs from it considerably with regard to certain qualities due to the peculiarities of the botanical variety. Crimean varieties of tobacco have larger leaves, but the difference in sizes between the different standards of quality is not big. The colour is darker than that of Yalta tobacco, varying from light to deep orange. The specific gravity of Crimean tobacco is very low (1.31-1.38), this, combined with considerable elasticity, reduces the amount of raw material required for industrial production. The Crimean brands of tobacco have greater

physiological strength than Yalta tobacco, this being due in particular to the high content of nicotine—about 3 per cent.

Crimean tobacco is also highly aromatic. In factory production it is used to add aroma to tobacco blends. Mixed with other types of aromatic tobacco Crimean brands make an excellent blend and add the necessary strength to the mixture without spoiling the flavour of cigarettes. Crimean tobacco combines fine aroma with strength and full flavour.

Excellent aromatic tobacco is produced in Kirghizia, Uzbekistan and Kazakhstan. The climate of these republics is sharply continental, in the South of Kirghizia, for

instance, summers are hotter than in the Sahara. The amount of precipitations is very small in all the tobacco growing areas, the content of moisture in the air low during the greater part of the year, winters are short and there is a great number of sunny days.

Aromatic tobacco varieties of the Yalta type are grown in Kirghizia, Uzbekistan and Kazakhstan on ashy and alluvial soil and light brown soil.

Tobacco varieties grown in the Armenian SSR are also noted for their aromatic qualities. This republic produces a considerable quantity of tobacco of the Sukhumi type. The climate of most tobacco growing districts in Armenia is continental. The conditions of climate and soil in the diverse districts and zones differ rather strongly, depending on the relief of the ground. But thanks to the length of the warm, frostless period, sun drying can be applied with good results in all the districts, this being obligatory in the case of aromatic tobacco.

Of the Soviet varieties of skeleton tobacco the best known are those produced in Drasnodar territory. They are divided into Maikop and Kuban brands. In comparison with Kuban varieties Maikop tobacco is of a lighter colour and has a more tender leaf, this being the result of different cultivation and flame drying. These varieties have a fine flavour and produce light, aromatic smoke. Their combustibility is very good and this, combined with the low content of nicotine makes them particularly

suitable for mixing with tobacco of the Virginia type. The high strength, coarse taste and frequently low combustibility of Virginia tobacco can be effectively neutralized by the addition of Kuban and Maikop varieties.

The manufacture of a good, full value cigarette requires the inclusion of sufficiently strong fine flavoured tobacco in the mixture. In the Soviet Union this kind of tobacco is obtained from the Sochi, Georgian and Armenian varieties, which are therefore called "high flavoured." On foreign markets these brands are known under the general name of "Sochi tobacco."

Sochi tobacco whether it is grown in the neighbourhood of Sochi or in Georgia and Armenia, contains a comparatively big amount of nicotine—about 3 per cent and sometimes more. These varieties have, as a rule, larger leaves than any other kind of tobacco grown in the USSR. In the warm, moist climate of the Sochi district tobacco of all qualities, including the most superior, reaches full ripeness, which, combined with thorough fermentation and sun drying, gives it an excellent colour.

Georgian tobacco of the sochi type, which also belongs to the group of high flavoured tobacco brands, has several peculiarities and in most cases its colour is lighter.

Armenian varieties of high flavoured tobacco are also more lightly coloured than the tobacco grown in Sochi. For strength they occupy an intermediary place between Kuban and Sochi tobacco. Armenian tobacco used to give fullness and strength to tobacco blends and to improve their flavour.



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PROGRAMME OF AGRICULTURAL OPERATIONS FOR THE QUARTER

APRIL—JUNE

FOR FLUE-CURED TOBACCO

Received from

Central Tobacco Research Institute,

Rajahmundry

In the very late planted crop the curings may prolong upto April. Generally during this part of the season the humidity in the atmosphere may not be sufficient to bring the leaf into condition after curing. Under these circumstances the humidity inside the barn, bulking and grading sheds is to be artificially built up by spreading wet gunnies on the floor and spraying water on the walls. Direct spraying on the leaf is to be avoided as it deteriorates the quality of the leaf.

In a normally planted crop the curings will be over by March. In April, the seed is to be harvested, if the crop is not topped. The earheads are cut and heaped in the

field for a few days for drying after which they are spread over on a threshing floor and threshed by trampling over with cattle or beating with sticks. The seed is winnowed to remove off all the chaff and then packed in double gunnies. There is ready market for seed which chiefly used for extracting oil to be used in paints and varnishes.

The stalks in the field are pulled out and stacked. After drying they are being mainly used as fuel. It may be worthwhile to try them for making compost though they are much woody and fibrous (if the stalks are cut into bits and composted they will compost well) and may not decompose readily. As these stalks are rich in potash they can be used for sterilising seed-beds in the succeeding season by burning the beds with them.

During the summer months Farm Yard Manure at the rate of 6 to 8 cartloads per acre is to be carted to the fields and incorporated into it with the early ploughings after the summer showers in May-June. Preparatory cultivation of the main field and the nursery are to be attended to as and when field conditions permit to bring the land into fine tilth, to conserve moisture and check weed growth. It is advisable to give the first ploughing with a mould board iron plough and subsequent ploughings with a country plough.

JANUARY—MARCH 1957

FOR CIGARETTE TOBACCO

Received from

Cigarette Tobacco Research

Sub-station,

Quarter

This is the summer period. Handling of the cigarette tobacco in almost all its field aspects would have been completed before the commencement of the quarter. Grading and the subsequent handling and the sale of the leaf however, may be prolonged into the quarter in exceptional circumstances under very late planted and green conditions of the crop.

On account of the dry and low humid conditions of the period it would be difficult to handle the cured leaf. Constant watering of the grading area and its surroundings and protecting the area against direct sunlight and draughts of wind would help to some extent minimising drying of leaf. However, it would be better that all handling of leaf was completed before the summer period commenced.

No field operations are generally undertaken in the quarter except that the fields are cleared free off the remnants of the previous crop and the field kept clean. All deep-rooted weeds may be dug out. All areas infested with grasses such as "Hariali", "Nut-grass" etc., may be dug deep with crowbars and the clods inverted for exposure to sun or in the alternative the areas may be given deep tractor ploughing. When the grasses get completely dried up the rhizoms should be collected and destroyed preferably by burning.

The field bunds and margins may be dug, cut and straightened against spread of grasses into the field area.

The flues and furnaces of the barns should be dismantled, cleaned and oiled and kept away and stored under dry conditions.

Manures, sand, seed etc., required should be gathered in preparation for the next nurseries and the crop.

FOR

MOTIHARI &

JATI VARIETIES

OF

HOOKAH TOBACCO, &

WRAPPER TOBACCO

Received from

Wrapper & Hookah

Tobacco Research

Station, Dinhat

till the fields are prepared for kharif cropping.

The spreading of tobacco leaves which have been already cured and placed in bulk heaps should be commenced if not already done. Remove all the wrinkles as the leaf while spreading and arranging them one over the other. It should be seen that the leaves are in condition for spreading. Tie hands of convenient size. Place these hands in a bulk heap and give a turning after a fortnight or so. Usually no grading is practiced by growers and the tobacco is sold after spreading.

Till the produce is sold out, periodic turning at interval of 2-3 weeks are continued.

(iii) WRAPPER TOBACCO :

In this entire quarter most of the attention shall be devoted towards bulking, fermentation, grading and preparing the cured produce for sale. Uprooting and removing of tobacco stalks, and ploughing of tobacco fields, however, needs timely attention in the beginning of the quarter.

Bulking & Fermentation:—Late primed leaves may be still in the curing phase. Earlier cured leaf which are by now in bulk heaps need frequent turnings. This should be carried out timely so as to avoid over fermentation of the leaf in the bulk heaps. Delay in turning would generate excessive heat inside the bulk heaps which would adversely affect the quality of the produce. Thus, it is safer to give turnings after 2-3 days to the newly formed bulk heaps. As the time advances the heat generated would decrease and interval between two turnings may be gradually increased to 4-5 days. Within first 3 weeks after putting the leaf in bulk heap, the leaf would show developing light brown colour. Green patches and off colour spots on leaf would start fading away.

Grading:—After the process of fermentation is over final grading of leaves is carried out. Each hand is examined individually and leaves of uniform length and uniform colour are sorted and tied into hands. In grading cigar wrapper leaves,

(i) MOTIHARI—(N. RUSTICA)

(ii) JATI (N. TABACUM)

Uprooting and removing of stubbles, ploughing of fields and preparing the cured produce for sale are the main operations of this quarter for both Motihari and Jati tobaccos.

Soon after the crop is harvested, plough down the tobacco fields, collect the stubbles and remove them out of the fields. Keep the fields exposed to sun after ploughing

only leaf length basis are currently employed at this station. The grade specifications are:—

Grade Special	...	above 20"
" I	...	" 16"—20"
" II	...	" 12"—16"
" III	...	" 9"—12"
" IV	...	" 6"—9"

After the final grading, the hands are again placed in the bulk heaps, and after few turnings, the produce is ready for sale.

Care in Storage:—Till the produce is sold, it needs to be carefully stored. Cigar wrapper leaves are attacked by cigarette beetles. At times the attack is heavy and causes considerable damage to the produce. It is, therefore, important to shake off the hands while breaking and remaking the bulk heaps. This would help not only in

shaking off the dust but also the larvae and adults of cigarette beetles, which should be immediately destroyed. When the cigarette beetle attack is observed, the bulk heaps should be given frequent turnings and if needed hands should be untied and examined for grubs, adults etc., especially in the butt ends. They should be collected and killed. The bulk heaps should be kept covered either with tarpaulin or other thick textured covering.

If the store room is airtight, then fumigation with Hydrocyanic Acid gas is an effective remedy for controlling the cigarette beetle. However, this required strict care since HCN is a deadly poisonous gas.

In absence of fumigation facilities, careful shaking of hands, periodic turning of bulks, secured coverings under and above the bulk heaps and their periodic cleaning together with clean surroundings, have proved useful in controlling the cigarette beetle damage to stored wrapper leaf.

PUBLICATIONS OF THE INDIAN CENTRAL SUGARCANE COMMITTEE

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Available from the Secretary

INDIAN CENTRAL SUGARCANE COMMITTEE

19-20 Rohtak Road, NEW DELHI-5

FOR N. RUSTICA

AND

DESI TOBACCOS

Received from Tobacco Research Sub-Station, Ferozepur

The period under review is characterised as growth period for tobacco crop in this State. Following is the schedule of Agricultural operations to be followed during this period.

April.

(1) **Interculture:**—The crop should be hoed every time the land comes in wattar (in proper working condition) after irrigation. Generally 2-3 hoeings by means of Khurpa are given during the month. The hoeing is stopped as soon as the crop is about a foot high and leaves grow sufficiently to shade the fields. In the later stages of hoeings, it is advantageous to also attend to earthing up of the roots of the plants. Every effort must be made to keep the field free of weeds.

(2) **Topping and suckering:**—N. rustica crop is in flowers after first week of April and should be immediately topped. This operation enables the plant to devote all its energies and food material for development of leaves. On the removal of terminal clusters i.e., inflorescence, the dormant buds in the axil of the leaves begin to give off shoots known as suckers which should also be removed regularly after 4-5 days. Fresh suckers continue to appear and should be periodically removed. Three to four suckering should be done in all. This operation is very important to get good quality tobacco. At Ferozepur Tobacco Sub-station, the studies made on the topping and

suckering in a regular trial conducted for three years has been found to result in an increase yield of 15% over the untopped crop.

The stage at which topping is done is also very important. Topping done at flowering stage gives best yield. Low topping results in the early maturing of crop. Thus where the crop is expected to be late and there is danger of its being spoiled by rains, low topping will be of considerable help to get good quality crop.

(3) **Supplementing with fertilizer:**—The manurial experiments conducted at Ferozepur have revealed that the application of Ammonium Sulphate at the rate of 100 lbs. N. (6 maunds of Ammonium Sulphate) per acre gives the best results. It should be applied in split dose, i.e., one-half before planting and one-fourth each at pre and post flowering time which has been found to give good economic results. Thus the crop should be supplemented with 1½ maunds of Ammonium Sulphate in the beginning of this month as well as at the close of this month in case of N. rustica. In case of N. tabacum all the remaining manure, i.e., 3 maunds should be added by the middle of April.

(4) **Irrigation:**—The irrigations are controlled by a number of factors, viz., weather, soil, manure, size of plot, etc. During this month it is preferable to apply irrigation at an interval of 5 to 7 days.

May.

1. *Topping and suckering*:—Topping and suckering in *N. tabacum* should be resorted to whereas in *N. rustica* suckering should be continued.

2. *Irrigation*:—As the season will be warmed up sufficiently, it is advisable to irrigate the crop during night otherwise the plants are likely to wilt. Heavy irrigation should also be avoided. In no case, the irrigation water should be allowed to stagnate in the fields. Frequent irrigation at short interval should be given to cope with the adverse atmospheric season prevailing during this month.

3. *Harvesting and curing*:—*N. rustica* is ready for harvesting by the 25th of May which can be judged by the thick broad flecks on the leaves and also when leaves are broken between fingers, gives a clear edge. Before harvesting, the field should be irrigated and when land is in 'wattar' the whole plants be cut and allowed to lie in the fields for 2 to 3 days for partially drying up. The plants are turned upside down next morning to ensure uniform drying. The operation is repeated on second day and the plants are kept closer so that harvested material is in a proper condition for burying. On third day the crop is collected early in the morning when dew is yet on the crop and the leaves are flacid, tied in small bundles and buried in a pit dug in the ground. The pits may be of 5' x 4' x 2½' size. The walls of the pit should be lined with some straw so that earth is not mixed with plants in this operation. This method is generally known as pit curing. There is another method of curing known as ground curing which is

very similar to first except that plants are not buried in the pits but are heaped on the floor of the room or in the fields. The heap is raised in two or more rows with the tip of the plants overlapping each other in the centre of the heap. After so arranging the plants, the whole heap is covered over if possible with gunny sheetings. The heap is allowed to remain in this condition for 4 to 5 days and is then rebuilt ensuring a regular turnover of the plants. In this method the upper plants get dried to a very great extent.

June.

Harvesting and curing:—Desi tobacco is ready for harvesting by the middle of June. The method of harvesting and curing is same as in case of *N. rustica*. Duration of the curing varies from 7 to 12 days depending on the condition of the stuff at the time of burying. If material at the time of burying is rendered sufficiently dry, duration of curing is more. When material is bulky and is partially dried, its duration should not exceed 8 days. When curing is completed, material is taken out from the pits and after removing its leaves these are twisted into ropes of convenient size. These ropes should be dried in the open for a day or so and then the stuff is ready for marketing.

The crop should be harvested before the rains set in. The harvesting of the crop should be postponed by at least 3 to 4 days after a shower of rains, otherwise the quality of the cured tobacco will be poor because the gummy substances on tobacco leaves which facilitate curing are washed off by the rains.

PROGRAMME OF AGRICULTURAL OPERATIONS

FOR THE QUARTER APRIL—JUNE

Received from

*Hookah and Chewing
Tobacco Research Station,
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Curing, fermentation and grading should be continued in the months of April, May and June. Grading should be done according to the quality, size and blemishes in the leaf and not according to their position on the plant. The graded leaves should now be packed in bundles with the help of grass, gunny cloth and jute rope. The bundles are made to weigh about five (5) maunds (400 lbs. of cured leaf). Before packing small quantity of water should be sprinkled on these bundles. The packages should be opened after 15 to 20 days and again repacked. If the tobacco is not sold, these packages are opened at an interval of one to two months and again repacked.

Ploughing of land for the next tobacco crop is continued during this period. After thoroughly preparing the land, sow leguminous crop (e.g.), sanai for green manuring by the end of June or just after the first showers of rain have been received. Select a new plot for raising the seedlings in the nursery. Well composted farmyard manure at 40—50 cartloads should be thoroughly incorporated in the nursery land.

Preparation of land:—Looking to rains which are received in the month of April—May the land is ploughed and harrowed and weeds removed and land brought to condition.

Manuring:—About 5 to 10 cart-loads of farmyard manure is carted to field and spread evenly in the field and well harrowed to mix the manure and soil.

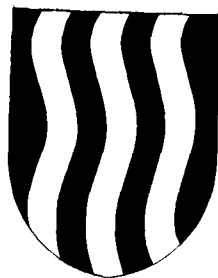
See bed preparation:—Farmyard manure is spread up to 6" depth and raised beds are prepared. The seed is well sprinkled over the bed and compacted. Water is given frequently for germination and growth.

Control of Damping off:—To control the "Damping off" of seedlings weekly spray of 2-2-50 bordeaux mixture is given to the beds.

Control of Caterpillars:—The caterpillars which damage leaf are hand picked and destroyed.

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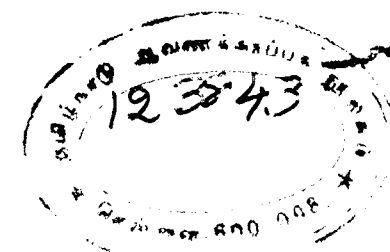
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