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Indian Tobacco

Jan-Mar 1953



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Indian Tobacco

QUARTERLY

VOL. III, No. 1

160
JAN. - MAR. 1953



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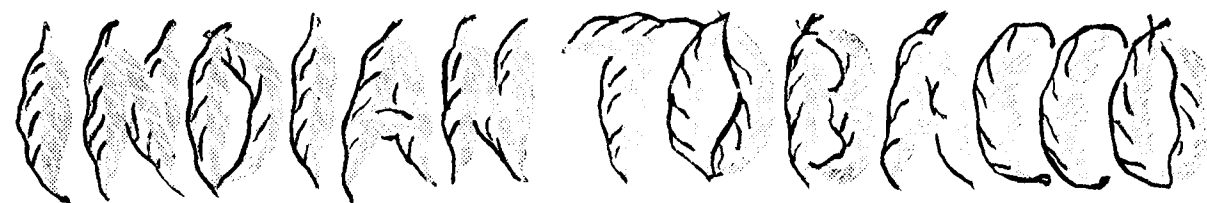
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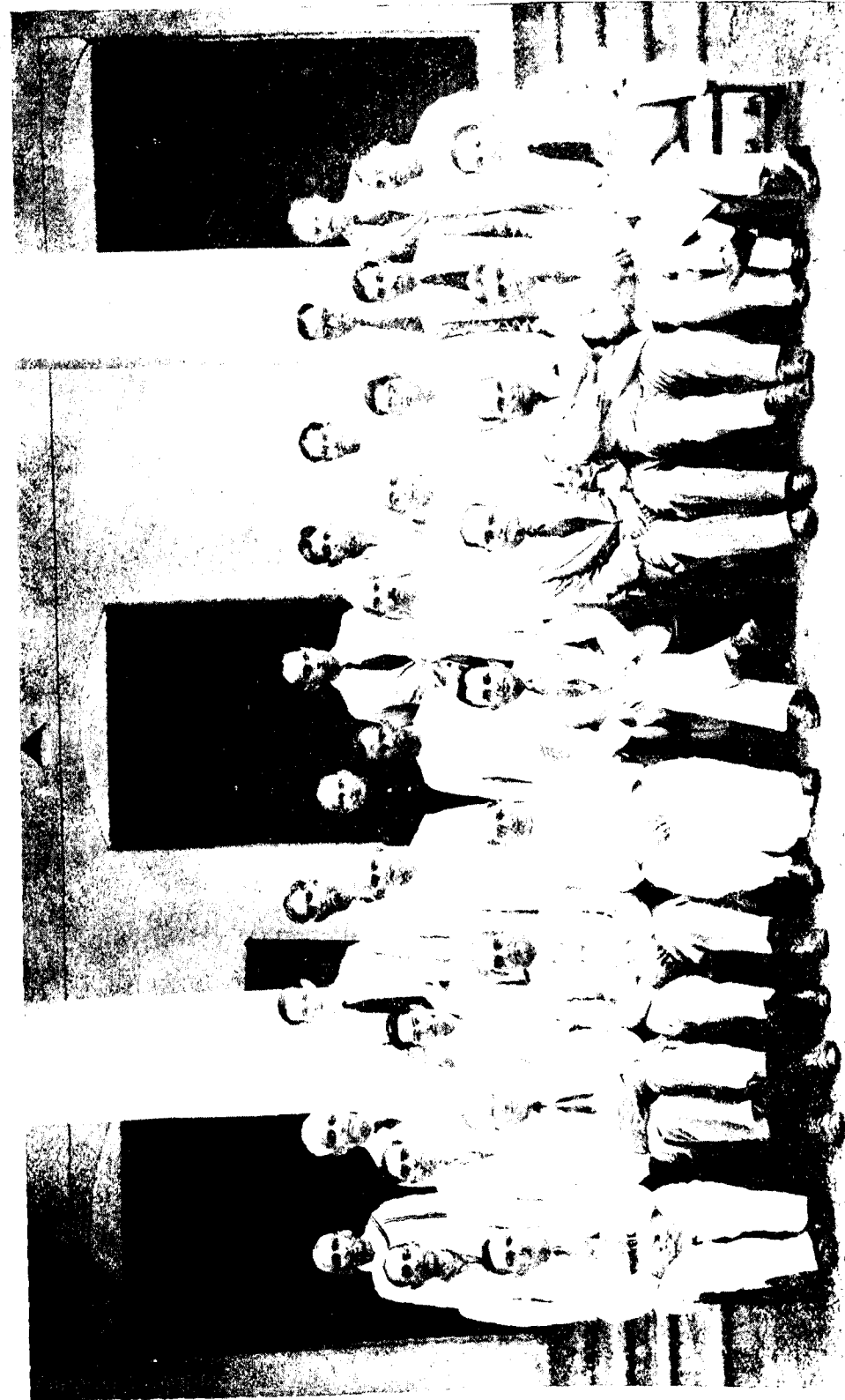
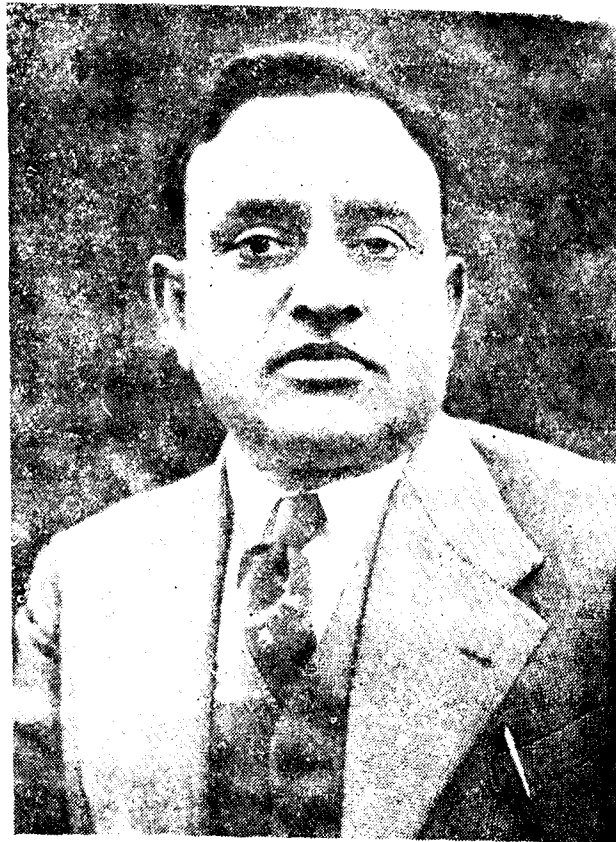


Photo taken on the occasion of the 13th Meeting of the Indian Central Tobacco Committee held at Madras on 19th February 1953.

President's Opening Speech at the 13th Meeting of the Indian Central Tobacco Committee



SRI K. R. DAMLE, I.C.S.
President, Indian Central Tobacco Committee.

THE thirteenth meeting of the Indian Central Tobacco Committee was held at Madras on 19th February 1953 under the chairmanship of Sri K. R. Damle, I.C.S., Additional Secretary to the Government of India in the Ministry of Food and Agriculture. Among those who attended the meeting were Sri E. S. Krishnamoorthy, Member of the Central Board of Revenue, prominent tobacco traders and growers and Members of the Parliament and State Legislatures. Mr. Gwynn Garnett of the U.S. Farm Bureau Federation, Washington, also attended the meeting.

Following is the text of the President's opening speech delivered on the occasion :

"GENTLEMEN:

"I have great pleasure in welcoming you all to the Eighth Annual General Meeting and the 13th Ordinary Meeting of the Committee.

"This is the first occasion when I am privileged to meet you all here assembled together, though I have met most of you during the Sub-Committee meetings. There have been certain changes in the membership: certain members retired on completion of their terms and some resigned. Some of the retiring members have been re-nominated and we have some new members. I welcome them all. The experience of those who have been re-nominated will, no doubt, be very valuable. The Secretary had conveyed the Committee's congratulations to Shri C. Subramaniam, Shri V. C. Palaniswamy Gounder and Shri C. M. Poonacha on their appointment as Ministers and Chief Minister respectively. They have acknowledged and wished our Committee well. We are proud that some of our members have attained these high offices.

"You will find from the agenda that some members will be retiring from the membership of JANUARY—MARCH, 1953

the Committee from the 1st April 1953. Our thanks are due to those members who, during their term, helped the Committee in its deliberations.

"I should also like to congratulate Shri Rangachari, a member of our Committee who had been nominated as a member of the newly constituted Expert Advisory Council. I am sure we can rely upon him to ably look after our interests in that capacity.

"Since there was not enough work relating to major policy matters or schemes and as whatever little work there was, could be disposed of by the Finance Sub-Committee, the half-yearly meeting was not held. It is, however, my desire that we should meet more often than has been possible for us to do so far, and thrash out our problems. Half-yearly meeting in August or September could be held at a suitable place.

"I shall now briefly sketch the progress made during the year. Firstly, I need not reiterate the usefulness of our periodicals—"INDIAN TOBACCO" and "TOBACCO BULLETIN." You are receiving them and you know their usefulness. There is also an item on the agenda on this subject. I feel that this useful activity should be continued and strengthened. Foreign firms and the trade in general have appreciated these publications and shown great interest in them.

"You will notice, that our bidi tobacco schemes at Anand have given us good receipts and the Committee's objective in transferring the scheme to the Institute of Agriculture, Anand, has been fulfilled. Our other research stations should also endeavour to bring more receipts to the Committee.

"You will be glad to know that the Central Board of Revenue have extended their active

co-operation in the preparation of the proposed Tobacco Directory. The Secretary has compiled all the information so far available. It will be published as soon as all the required matter is ready. We must now undertake the preparation of useful leaflets giving latest information in brief, about various agricultural practices to the farmers in tobacco cultivation. These should be published early. The Secretary has also requested the State Government to reproduce freely the articles or other material from our publications in their regional languages for the benefit of the ryots. At present it will be too much for the Committee to undertake publication of "INDIAN TOBACCO" and "TOBACCO BULLETIN" in regional languages also.

"You will find that the Annual Report has been written on last year's model which is quite self-contained and very informative.

"The West Bengal Government have made available to us 43.64 acres of land for the establishment of our Wrapper Tobacco Research Station. This work is expected to be commenced soon. I hope this will help in producing the much needed wrapper tobacco in the country.

"At the present state of food supplies in the country, our policy should be to produce tobacco of better quality and higher yield by intensive cultivation without increasing the acreage under tobacco. Many important items of research of practical value are being carried out at our research stations. The demonstrations on the improved methods of handling and curing leaves were also repeated this year at Koppole and Budampadu villages in the Guntur district.

"The administration of the Tobacco Grading Scheme will be shortly transferred to the Agricultural Marketing Adviser. By this the Committee will not lose contact in any way with the tobacco grading work. The periodical progress reports and other information will, no doubt, be made available to the Committee for information and suggestions as in the past. The Committee will in this way be posted with information

regarding the activity carried out under the grading scheme and be able to offer suitable and helpful suggestions.

"Tobacco is a commodity of all-India importance. It brings about 34 crores of rupees annually to the Central Exchequer in the form of excise duty, besides earning valuable foreign exchange and providing employment to thousands of people. This commodity has suffered comparatively less during the recent slump. In spite of the importance of this commodity, many of the State Governments have not sent subjects for the consideration of the Committee as they are either occupied with other activities like the Grow More Food campaign and irrigation projects or have no funds to spare for this important crop. I hope this apathy will soon be removed.

"Among other marketing activities, you will be glad to know that the Madras Government have extended the provisions of the Madras Commercial Crops Market Act to Tiruchirappalli and Coimbatore Districts. I feel that our Committee should encourage co-operative societies for production, marketing and the curing of tobacco as far as our finances permit. These will help to improve the lot of the farmers.

"As regards auction marketing of tobacco, the Government of Madras have accepted the Guntur Tobacco Market Committee's proposal and started the auction marketing scheme at Tadikonda in addition to Guntur and Mangalagiri centres.

"The tobacco statistics indicate that our exports are increasing while the imports are decreasing. This is a healthy sign. Our total tobacco exports have increased to 122 million lbs. in 1951-52 as against 96 million lbs. in 1949-50, while our imports have decreased to 5 million lbs. in 1951-52 as against 8 million lbs. in 1949-50. During 1951-52, Russia, Hongkong and Japan showed increased interest in our tobacco. We should constantly endeavour to maintain and expand our eastern markets which are important

INDIAN TOBACCO

for the sale of our medium and low grades of tobacco. Of late, the demand for bidi tobacco from the neighbouring countries of Pakistan, Ceylon and Burma is not very encouraging.

"You will be glad to know that the Ministry of Commerce and Industry propose to appoint a Tobacco Sales Officer in Paris to expand our tobacco trade. Many visitors from foreign countries, e.g., from Japan, U.K., U.S.A., etc. came to the Committee's headquarters and obtained information regarding tobacco.

"The two students who have been sent abroad for training are progressing well. I thank the Imperial Tobacco Company on behalf of the Committee for their generously accepting the Finance Sub-Committee's recommendations and for giving an additional allowance of Rs. 3,600/- each for the two students. One officer from the Central Tobacco Research Institute has also gone to U.S.A., under the Point Four Programme for studies in viruses. Another officer of the Tobacco Grading Scheme has also gone to U.S.A. for studies in tobacco grading and auction marketing.

"The Government of India have taken a decision that the Committee's re-drying plant

should be disposed of in view of the changed circumstances. The money realised by its disposal will be made available for strengthening the other activities of this Committee. The details are being worked out in consultation with the Directorate of Disposals.

"As regards the financial position of the Committee, you know that the grant has been reduced from Rs. 10 lakhs to Rs. 8 lakhs for the ensuing season. The Committee will further review its plans for Marketing and Development of tobacco in the course of next few months, as it is felt that these branches of its activity deserve greater attention. I hope, that the Government will sympathetically consider the question of making additional funds available to the Committee on the basis of the new workable schemes which might be proposed in the interest of tobacco development and marketing.

"Before we start consideration of the items on the agenda, I wish to refer to the valuable services rendered by my predecessor, Sardar Datar Singh, to our Committee for nearly six years. I am sure you all will agree with me in placing on record our appreciation of the services rendered by Sardar Datar Singh in the development of this Committee".

The following persons have been nominated as members of the Indian Central Tobacco Committee, during the quarter-ending March 1953 :

- (1) Sri H. R. Saini, M.Sc. (Ph.), B.Sc. (Edin.),
Director of Agriculture, Punjab (I).
- (2) Sri S. Bhoothalingam, I.C.S.,
Joint Secretary to the Government of India,
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Important Decisions of the Indian Central Tobacco Committee at its 13th Meeting

by

DR. M. S. PATEL, M.Sc., Ph.D., (N. CAROLINA)

Secretary, Indian Central Tobacco Committee.

THE Committee decided to chalk out a programme of work relating to research, development and marketing of tobacco in India to be carried out during the next three years and submit the same to the Government of India for purpose of any additional grant required for implementing them. The State Governments had been recommended to form co-operative societies for cultivation, grading and marketing of tobacco and encourage such societies wherever they existed already. The Committee was prepared to meet half of the cost of the schemes received from States in this connection. Schemes for the production of cigarette tobacco in Assam and for improvement of indigenous tobacco in Uttar Pradesh had been recommended to the respective State Governments. A scheme for the establishment of an exploratory marketing centre at Bhagwanpur in Bihar has been sanctioned and a scheme for demonstration of better handling of leaf during flue-curing in two more centres had also been sanctioned. The Committee had also decided to start a competition among growers in 3 important zones in the country for growing better types and for best economic curing of Virginia flue-cured tobacco. A Sub-Committee had been formed to work out the details relating to this competition. It has also been decided to utilise the subordinate field organisations of the Central Board of Revenue in different parts of the country for distribution of literature and seed to cultivators wherever possible.

The Government of India had been requested to supply 2 lakh tons coal for flue-curing barns in Madras State and supply them in time. The Railway Board had been requested to give

adequate priority in allotting wagons for the movement by rail of tobacco meant for export as any delay in its movement would result in deterioration of the quality of leaf.

The Committee noted that a Tobacco Sales Officer will shortly be appointed by the Government, in Paris, and the Government had been requested to intensify promotion of export trade in other continental countries, the Committee providing the necessary propaganda materials, descriptive literature and standard samples to the Indian Government Trade Commissioners. For promotion of export trade and to clear off the stock of low grade tobaccos, it was decided to move the Government to sponsor a Mission to Eastern countries. The Committee decided that the present system of compulsory certification of quality control of tobacco intended for export should continue in the interests of country's tobacco export trade.

It also agreed to the Government's suggestion to dispose of the Committee's Redrying Plant and machinery, and decided that, if an application was received from the Guntur Tobacco Market Committee through the State Government to purchase the plant and machinery, paying the cost thereof in instalments, it could be considered favourably.

The Committee also adopted its Annual Report of last year and Budget Estimates for the coming year and reports of its various research stations and schemes and their programme of work for the coming season. Certain routine and administrative matters were also decided.

Sri Mohanlal A. Parikh was re-elected as Vice-President of the Committee for the coming year (1953-54).

JANUARY—MARCH, 1953

Indian Tobacco— Its Place in Eastern and Neighbouring Countries

by

DR. M. S. PATEL, M.Sc. Ph.D. (N. CAROLINA),

Secretary, Indian Central Tobacco Committee.

THE bulk of Indian exportable tobacco is of Flue-cured Virginia, *Natu* and bidi types. There is good demand for the top grades of Virginia tobacco in the United Kingdom and other European countries. The disposal of low grades, however, presents a veritable problem, despite their exports to some Continental countries, which however, form only a small percentage of their total production. Of late, eastern countries, like Japan, Hongkong, China, Indonesia and Malaya have evinced interest in our low grades which are available for export in sufficient quantities.

The other type of Indian tobacco which is in demand in foreign markets is bidi tobacco. Pakistan, Ceylon, Burma and Malaya are the important markets for bidi and bidi tobacco, the first two being the most important.

The present situation in each of these countries as regards their quantitative and qualitative requirements of Indian tobacco is assessed in the following paragraphs :

Japan :—

Japan produces about 216 million lbs. of tobacco from an area of 133,000 acres. The main types of tobacco produced are Virginia, Native and Burley types. Though, about half of her tobacco production consists of Virginia leaf, she is not self-sufficient in good quality Virginia leaf for her cigarette industry. She is, therefore, importing Virginia leaf from India and the U.S.A., about 98% of her imports being from India. The dollar scarcity combined with cheapness and suitability of Indian tobacco has obliged Japan

to give more attention to Indian tobacco. Till 1951, she was interested more in Indian Sun-cured tobacco than in F.C.V. But since 1952, she is buying Indian Virginia tobacco of Grades 4, LBY and LBY2 besides Grades CBR and CDK of Sun-cured country tobacco. These are blended in the manufacture of cigarettes with home-grown tobacco.

Japan purchased 14.6 million lbs. of unmanufactured tobacco in 1952 which is significantly more than that purchased in 1951 and 1950, viz., 2.5 and 2.8 million lbs. respectively. The chances for Indian tobacco in this country are bright, which could be further enhanced if the prices and quality of Indian leaf are competitive.

Hongkong :—

Hongkong, one of the major ports in the world, is a very big tobacco assembling centre though no tobacco is grown there. Its storage warehouses and sales facilities for leaf tobacco and tobacco products are above average. The bulk of Hongkong's imports is Flue-cured Virginia for use in cigarettes. Prior to World War II, China was the main source of supply but during the past few years most of these imports came from the U.S.A. and India. India is, however, now becoming an increasingly important contender for the market and the imports from the U.S.A. are declining. This may be attributed to Hongkong's dollar shortage and the comparative cheapness of Indian tobacco.

In 1951 Hongkong purchased 18.7 million lbs of Indian tobacco, which constituted about

INDIAN TOBACCO

M. S. Patel

27% of her total imports during that year. In 1952, the purchase was only 2.1 million lbs. Lower grades of Indian F.C.V. are in demand in Hongkong.

China :—

China is the second largest tobacco producing country in the world with an annual estimated production of 1,200 million lbs. from an approximate area of 1,200,000 acres. Of these about 260 million lbs. are Virginia tobacco. In spite of this, she has to depend on foreign countries for Virginia tobacco for blending in cigarette manufacture. China occasionally purchased Indian tobacco through Hongkong. 3.3 million lbs. of Indian tobacco was purchased in 1951, which accounted for about 40% of her total imports in that year. In 1952 however, no purchase has been reported. China's purchases are mostly lower grades of Indian F.C.V. tobacco.

Indonesia :—

During the period 1935-39 about 240 million lbs. of tobacco mostly cigar leaves were produced annually in Indonesia from an area of about 4.5 lakhs of acres. Out of these, about 100 million lbs. were exported. But the area under tobacco dwindled very much during and after the last World War. In 1950, she produced only 67 million lbs. from an area of 172,000 acres. Indonesia imports tobacco and tobacco products mainly from the U.S.A., Holland and the U.K. She did not import much from India except in the recent past. Recently owing to a variety of reasons, there has been drop in Indonesian production which led to some demand for Indian tobacco, particularly Flue-cured Virginia tobacco. In 1952, Indonesia imported 1.6 million lbs. of Indian low-grade Virginia tobacco as compared to 1.6 and 1.75 million lbs. in 1951 and 1950 respectively. The U.S.A. being the most important source for Indonesia, supplied her about 12.5 million lbs. of tobacco in 1951.

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Malaya :—

Malaya is not an important tobacco producing country and depends on foreign imports for her requirements. Malaya requires Indian manufactured tobacco consisting of cigarettes, cigars and bidis. Demand for unmanufactured tobacco is confined mostly to lower grades. 360 thousands lbs. of Indian tobacco and tobacco products were imported into Malaya during 1952 as compared to 917,000 lbs. and 131,000 lbs. in 1951 and 1950 respectively. More than half of her purchases of Indian raw tobacco in 1952 was of low grade.

Burma :—

In 1950-51, Burma produced about 90 million lbs. of tobacco from 100,000 acres. The tobacco is used mainly for cheroot with a negligible amount for cigarette and pipe. Cigarette tobacco is being grown since 1936. Acreage planted with Virginia tobacco in 1951-52 has increased to 1,500 acres, compared with only 300 acres in 1950-51. Even though the acreage planted with Virginia leaf is increasing rapidly, it is reported that the quality of leaf has not improved appreciably. Bidis are also manufactured to a limited extent.

Latest figures of Burmese tobacco exports and imports are not available. But in the post-war years, Burma's exports and imports, the major portion being with India, have considerably dwindled. The unmanufactured tobacco imported from India is mainly that of *Bhengi* from Bengal and *Lanka* or *Coringee* type from Madras, the former type being used for chewing and the other two types in making cheroots. India is also a supplier of cigarettes to Burma. In 1952, Burma imported 170,401 lbs. of Indian tobacco mostly unmanufactured, as against 239,036 lbs. and 254,144 lbs. in 1951 and 1950 respectively. In 1951, Burma imported a few thousand lbs. of Bidis also from India.

Under the Import Trade Control regulations in force in Burma, tobacco both manufactured

and unmanufactured can be imported into Burma only under a licence issued by the Director of Supply, Ministry of Commerce, Government of the Union of Burma. Import duty leviable on Indian tobacco in Burma is given below :—

Tobacco manufactured not otherwise specified—12 annas per lb.

Cigars—40% *Ad valorem*.

Tobacco manufactured—10% *Ad valorem*.

Ceylon :

Ceylon produced about 8 million lbs. of tobacco from 11,300 acres in 1951-52 as against 7.5 million lbs. in 1950-51. Production of Virginia tobacco amounted to 1.25 million lbs. Other types of tobacco produced in Ceylon are mild cigar tobacco, Malayalam chewing tobacco, local chewing tobacco and bidi tobacco. Ceylon is not self-sufficient in tobacco and therefore depends on foreign countries including India for her tobacco requirements. About 70% of her tobacco imports are from India. As the production of Virginia tobacco is not sufficient to meet her internal requirements, the imports of unmanufactured cigarette tobacco and manufactured cigarettes have steadily increased during the last ten years. In 1951, Ceylon imported 1.6 million lbs. of unmanufactured cigarette tobacco valued at about Rs. 5 million. The imports of Virginia tobacco are mainly from U.S.A. and Southern Rhodesia and a small quantity from India. The imports of cigarettes are mainly from the U.K. and the U.S.A.

Ceylon consumes a good amount of Indian Bidis. She imported about 2.47 million lbs. of Bidi tobacco, Bidi Wrapper leaves, Bidis and Snuff in 1952 as compared to 2.36 million lbs. in 1951 and 1.35 million lbs. in 1950 respectively. The imports of Bidis, Bidi tobacco and wrapper leaves from India have shown a progressive increase during the last few years.

The Malayalam (Jaffna) tobacco which is the only type exported from Ceylon is exported to the Travancore-Cochin State of the Indian Union.

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The quota of 5,740 candies (2.87 million lbs.) per annum exported at a duty of Rs. 300 per candy (500 lbs.) was reduced to 1,800 candies (900,000 lbs.) per annum with effect from April 1950, with a 10% reduction every year. By 1960, the quota is expected to be nil. It is understood that the Ceylon Government are contemplating to make a representation to the Government of India to modify their import policy towards this type of tobacco.

It will be observed from the foregoing that Ceylon is at present a good export outlet for Indian Bidis and Bidi tobacco. According to the latest "Report on the Re-organization of the Tobacco Industry in Ceylon" published by Ceylon Government in October 1952, however, the export outlook for the future may not be bright in view of her proposed attempt to become self-sufficient in her requirements of tobacco.

Pakistan :—

The average annual production of tobacco in Pakistan has been estimated at about 160 million lbs. from a total area of 1,89,500 acres. Pakistan is considered to be the seventh important tobacco producing country in the World. The main types of tobacco produced in Pakistan are Hookah-Snuff, Chewing, Cigar and Cherooot tobacco. About 67% of the tobacco produced in Pakistan is Hookah, Cigarette, Cigar and cherooot tobacco amount to 15.8%, Snuff and chewing tobaccos 8.3% and 3.6% respectively and Bidi tobacco roughly 5.2%.

Although Pakistan produces large quantities of tobacco she has yet to depend on foreign countries for superior quality Virginia tobacco and bidi tobacco. Apart from raw tobacco, large quantities of cigarettes, cigars, pipe and cut tobacco, bidis etc. are also imported every year. In 1950, the imports included 19.2% of unmanufactured tobacco, 6.7% cigarettes, 0.3% cigars, 0.1% pipe tobacco and 70.37% tobacco of other sorts including bidi tobacco. The main sources of imports are the U. K., India and the

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U.S.A. Small quantities are also being imported from Burma. It has recently been reported that Pakistan's new economic policy is to cut down imports from dollar areas to the barest minimum.

Large quantities of bidis are consumed in Pakistan. Her tobacco industry is concentrated in Sind and East Bengal. As bidi tobacco is not grown in Pakistan on the required scale, large quantities are annually imported from India. Substantial quantities of bidis are also imported from India. Soon after partition, experiments on the possibilities of growing bidi tobacco in Pakistan were undertaken and it was observed that bidi tobacco can be grown satisfactorily in certain parts of Sind and East Bengal. Active attempts are understood to be afoot to cultivate bidi tobacco with a view to become self-sufficient in the near future.

Pakistan is, at present, trying to reduce the imports of bidis, bidi tobacco and bidi leaves from India. A short time before the current Indo-Pakistan Trade Agreement was concluded, Pakistan, with a view to booming her own cottage industry raised the *ad valorem* import duty of 10% on Indian Bidis to 50%, and reduced the excise duty on local grown tobacco. Annual Pakistan purchases of our tobacco during the tenure of the previous trade agreement were of about Rs. 8,36,00,000 out of which Bidis covered Rs. 4,28,00,000 and the raw materials (Bidi tobacco and Bidi leaves) Rs. 4,08,00,000. But all the three articles were under open general licence. The last agreement provided for Rs. 2 crores only, bidis for Rs. 1 crore and the raw materials for another crore. Recently, opinion has been adduced both by the press and the public in Pakistan to relax import restriction on Indian tobacco particularly on bidi wrapper leaf.

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Russia :—

Detailed statistics of the Russian tobacco production, exports, imports etc. are not available. About 450 million lbs. of tobacco are reported to have been produced in 1950. Russia's production of tobacco has, however, to be supplemented by foreign exports to meet her requirements. She had imported low grade Indian tobacco to the extent of about 15 million lbs. in 1951 as against 4.6 million lbs. and 1.5 million lbs. in 1952 and 1950 respectively. Russia would appear to be a good prospective buyer for our low and medium grades.

Indo-China :—

Indo-China is also a good market for Indian low grade tobacco. Indian exports to Indo-China are steadily increasing from 1950. Indo-China imported 305,985 lbs. of Indian tobacco in 1952 as compared to 43,948 lbs. and 8,800 lbs. in 1951 and 1950 respectively.

Muskat Territory :—

This territory shows promise of a good market for our bidi and bidi tobacco. She imported 5,200 lbs. of bidis in 1952 as against 2,823 lbs. and 782 lbs. of bidis and bidi tobacco in 1951 and 1950 respectively.

Other important outlets for Indian bidis and bidi tobacco are Aden and Dependencies, Bahrain Islands, Kuwait and Saudi Arabia. In January 1953 Afghanistan imported about 450 lbs. worth about Rs. 5,000 of Indian bidis. It is understood that Afghanistan is trying the Indian bidis and if found suitable, she might turn out to be a good market for Indian bidis and bidi tobacco.

The following table shows the exports of Indian unmanufactured and manufactured tobacco to these countries :

Table—Indian Tobacco Exports to
(1950, '51)

Countries.	Year.	Un-Manufactured.		Cigarettes.		Cigars.	
		Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
		lbs.	Rs.	lbs.	Rs.	lbs.	Rs.
Japan	1950	2,784,064	19,43,912	...	...	...	...
	1951	2,530,698	20,39,701	...	...	...	...
	1952	14,602,069	1,81,90,097	...	...	...	...
Hongkong	1950	2,688,529	23,86,366	...	...	...	...
	1951	18,658,722	1,11,26,072	4,214	20,600	...	...
	1952	2,105,776	31,40,129	...	...	...	...
China	1950	69,223	59,594	716	1,392	...	...
	1951	3,317,343	15,89,812	42	577	...	...
	1952	...	...	...	...	...	...
Indonesia	1950	1,754,629	23,11,481	...	...	...	...
	1951	1,606,132	21,47,971	42	515	...	...
	1952	1,608,648	19,49,570	...	...	...	...
Malaya and Singapore	1950	38,256	57,263	84,691	1,15,383	48	96
	1951	133,599	2,39,126	760,367	47,95,814	80	240
	1952	203,679	4,25,896	97,238	6,32,048	2,837	5,825
Burma	1950	22,220	57,886	231,924	16,08,757	...	...
	1951	127,576	3,32,639	108,214	8,49,543	...	...
	1952	170,401	4,15,409	...	...	...	...
Ceylon	1950	845,917	16,17,374	...	...	...	...
	1951	950,244	19,39,118	36	455	...	...
	1952	919,310	19,02,258	...	...	...	...
*East Pakistan	1950	1,228,043	16,70,374	850,347	23,59,235	...	...
	1951	21,836	30,834	13,323	81,512	...	...
	1952	...	...	...	...	...	...
*West Pakistan	1950	7,379,618	86,24,296	148,763	12,27,632	5,311	8,873
	1951	2,484,528	25,26,549	300,813	9,23,850	2,450	10,606
	1952	1,658,066	15,02,991	5,527	38,771	6,905	24,035
Russia	1950	1,472,077	5,30,981	...	...	...	...
	1951	14,944,540	1,00,65,112	11	132	...	...
	1952	4,683,802	28,56,132	...	...	...	...
French Indo-China	1950	8,800	17,600	...	...	...	...
	1951	43,948	61,802	...	...	...	...
	1952	306,985	8,76,504	...	...	...	...
Muskat Territory	1950	104	115	...	...	...	...
	1951	1,115	1,115	...	...	...	...
	1952	...	...	...	...	...	...

* Export by Sea

Conclusion :—

It will be seen from the foregoing, that countries like Japan and Hongkong have commenced evincing great interest in the Indian F.C.V. tobacco. China itself, which is one of the largest tobacco producing countries in the world requires more and more of Virginia tobacco for her increased demand for home consumption

and has been purchasing occasionally from India. Indonesia has already begun showing interest in Indian tobacco and during the last year, several enquiries have been received from that country for our low grades of tobacco. The demand for Indian tobacco of low and medium grades in these countries will continue if Indian tobacco is competitive in prices on

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Eastern and neighbouring Countries.
& '52).

	Bidis.		Other Sorts.		Total of Manufactured.		Grand Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	lbs.	Rs.	lbs.	Rs.	lbs.	Rs.	lbs.	Rs.
...	...	...	...	...	...	...	2,784,064	19,43,912
...	...	...	...	...	...	...	2,530,698	20,39,701
...	...	...	...	...	...	...	14,602,069	1,81,90,097
...	...	...	...	...	...	...	2,688,529	23,86,366
...	...	...	...	...	4,214	20,600	18,662,936	1,11,46,672
...	...	...	...	...	...	...	2,105,776	31,40,129
...	...	...	...	...	716	1,392	69,939	60,986
...	...	...	...	...	42	577	3,317,385	15,90,389
...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	1,754,629	23,11,481
...	...	...	...	...	42	515	1,606,174	21,48,486
...	...	...	...	...	...	...	1,608,648	19,41,570
...	...	...	8,156	14,562	92,895	1,30,041	131,151	1,87,304
...	...	...	22,636	74,524	783,083	48,70,578	916,682	51,09,704
...	38,130	159,030	18,135	52,541	156,340	8,49,450	360,011	12,75,346
...	...	...	...	...	231,924	16,08,757	254,144	16,66,043
...	...	...	3,246	38,627	111,460	8,88,170	239,036	12,20,809
...	...	...	...	...	...	...	170,401	415,409
...	...	...	504,711	19,87,966	504,711	19,87,966	1,349,728	36,05,340
...	...	...	1,414,636	53,52,343	1,414,672	53,52,798	2,364,916	72,91,916
...	1,027,050	38,75,438	527,600	19,30,991	1,554,650	58,12,429	2,473,960	77,14,687
...	...	...	702,725	22,56,980	1,553,072	46,16,215	2,781,115	62,86,589
...	...	...	4,928	11,520	18,251	93,032	40,087	1,23,866
...	...	...	...	...	...	...	...	...
...	...	...	2,635,806	95,98,539	2,789,880	1,08,35,044	10,169,498	1,94,63,340
...	...	...	2,956,684	92,78,140	3,259,947	1,02,12,605	5,744,475	1,27,39,154
...	1,561,298	49,54,454	1,327,393	38,90,083	2,900,223	89,07,343	4,558,289	1,04,10,334
...	...	...	...	...	...	...	1,472,077	5,30,981
...	...	...	...	...	11	132	14,944,551	1,00,65,244
...	...	...	...	...	...	...	4,683,802	28,56,132
...	...	...	...	...	...	...	8,800	17,600
...	...	...	...	...	...	...	43,948	61,802
...	...	...	...	...	...	...	306,985	8,76,504
...	...	...	678	1,634	678	1,634	782	1,749
...	...	...	1,708	4,085	1,708	4,085	2,823	5,200
...	5,200	13,195	...	...	5,200	13,195	5,200	13,195

and Air only.

quality basis. Every attempt should be made to expand these markets and the aim should be to maintain trade relation in tobacco with these countries at least to the extent to which it has been established with the Western countries.

As regards bidi tobacco, Pakistan and Ceylon have been very good export outlets so far, but the future prospects do not look encouraging as those countries are reported to be striving hard towards self-sufficiency in tobacco.

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Cultivation and fertilisation of tobacco in Indonesia

By

M. ROSANOW AND J. M. WYBENGA.

Plant Nutrition Research Laboratory, Wageningen, Holland.

A REVIEW of the tobacco cultivation in Indonesia should distinguish "Estate"—and "Native" tobaccos.

The "Native" tobacco culture lacks a scientific basis, while it is just scientific research and long years of elaborate experimentation that enabled the "Estate" Companies in Java and Sumatra to develop world famous quality tobaccos. Information on the cultivation of Native tobaccos is scarce, mainly due to the great differences in local practices. On "Estate" tobaccos there are more data available that might serve for a comparison with tobacco growing in India.

The main centres of Estate tobacco-culture are Deli (E. Sumatra), Besuki (E. Java) and the Vorstenlanden (Centre Java). Unfortunately, the latter producing centre has not been able to resume its activity after the war which is due to the still prevalent social and political difficulties. The former Dutch estates were badly damaged during the war and have not come into production again.

AREA UNDER CULTIVATION.

In prewar times (1938) the total area under cultivation amounted yearly to: Deli 13,000 ha, Besuki 8,000 ha, Vorstenlanden 6,500 ha. The native tobacco occupied an area of 147,000 ha, mainly situated in Java and the adjacent small island of Madura.

The total production amounted to 97,500 tons of which quantity 13,800 tons were produced by Deli.

An impression of the different qualities produced can best be obtained by comparing the

prices of tobacco from the different centres. In 1938 following average prices were quoted: Deli 108, Vorstenlanden 42, Besuki 33 and Native "Krosok" 12 guilder cent per $\frac{1}{2}$ kg.

No official data are available about the postwar areas under cultivation. In 1950 an area of approximately 4,000 ha was harvested in Deli and gave a production of 3,400 tons of dry product. Besuki production was low due to sabotage. On the other hand, the culture of Virginia flue-cured tobacco is becoming popular; the product is mainly destined for domestic consumption.

The first reports on tobacco growing in Indonesia date back from the beginning of the 17th century, when this crop was introduced by the Portuguese. Although native tobacco-culture became popular later, the Europeans did not show much interest in this product due to the fact that the curing methods greatly differed from those in Europe and America and no market was to be found for the Indonesian product.

The first estate was founded in Besuki in 1855, while Deli began to develop in 1863, after the foundation of its first estate by NIENHUYNS.

The cultivation methods in different districts are largely determined by the purposes for which the tobacco is grown; for example chewing, cigar, pipe, wrapper leaf and cigarette tobacco. They also vary with the different conditions of soils and climate.

NATIVE TOBACCO CULTURE.

The native tobacco culture shows great similarity with the cultivation of chewing tobacco in the Sivapuri area of Chidambaram Taluk in

India. The Native cut tobacco (Radjangan) is cut by the peasant himself and marketed in this cut condition. This tobacco serves mainly for domestic use and is not suitable for export, although it is sometimes used as a constituent of cigarette-tobacco mixtures. "Krosok" is the tobacco of which the leaves are dried and then sold to local dealers who prepare the stuff for

export or for domestic Javanese Cigarette factories. The population prefers a strong, full flavoured tobacco as chewing tobacco or the so called "ROkok Klobot" (spicy cigarettes wrapped in bracts of corn cobs); the upper and higher middle leaves of the plant constitute the best quality for this purpose; the lower leaves are not so suitable and give inferior qualities.

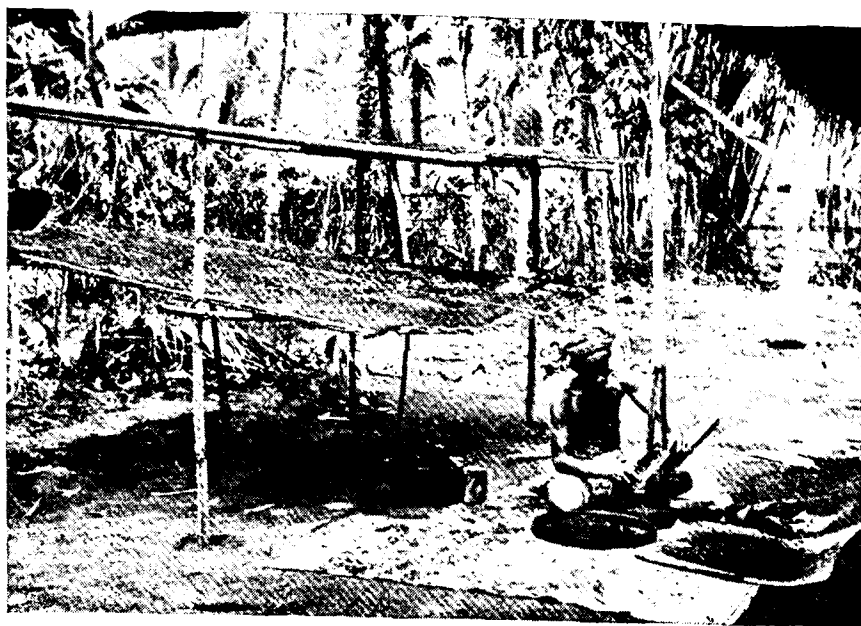


Fig. 1.—Cutting and Drying of Radjangan Tobacco.

Fertilisation is usually given as farmyard manure; it is spread over the land or sometimes applied in the plant holes. There is a tendency to introduce dressings with commercial fertilisers but the involved cost is usually too high for the ordinary peasant. The average yields amount to 800-900 lbs. per acre.

Nevertheless there are encouraging signs of increased use of commercial fertilisers especially in the more progressive districts of native tobacco growing.

JAVA-VIRGINIA TOBACCO.

The development of the home production of Virginia cigarettes in the early thirties led to an

introduction of Virginia tobacco culture on a rather big scale. (In 1940 an area of 45,000 acres was planted). The tobacco was grown by the native population but the planting material was supplied by the European firms which also provided the necessary fertilizer-mixtures and gave financial support to the planters during the cultivation period. The curing process was carried out in central flue-curing estates in order to produce a final product of a high standard quality. This working system has not been resumed after the war, the estates not being able to control the financial side of the business. Instead hereof several (damaged) sugar factories turned to Virginia tobacco culture due to the shortage of supply of cigarettes tobacco and the

INDIAN TOBACCO

possibility to develop an activity without large capital investments. Most Virginia tobacco (var. Harrison special) is grown on sawahs following the harvest of paddy. Contrary to the practice in cigar tobacco, the harvest takes place in the dry season ("not rained tobacco"). The leaves are picked in the late morning hours and thus contain larger amounts of carbohydrates than cigar tobaccos. The average production amounts to 1,000 lbs. per acre.

ESTATE TOBACCO GROWING.

Deli—

Climate :

The climate is characterized by a favourable division of rainfall during the planting period. The rainfall in the plains amounts to 2000 mm. per annum on an average. The planting times are calculated in such a way that the plants, when about 3 weeks old, receive max. 30 mm. rain per week.

Soils :

Apart from a favourable climate, the soil is the decisive factor for the success of the growth. Most tobacco plantations are situated on alluvial soils. On soils with dacitic material, tobacco growing presents the best chances and gives a product of superior quality. The types of soils are very varying; sandy loams, loamy sands, white clay soils and reddish humic sand. A field is only planted with tobacco every alternate 8 years. This long interval is considered to be necessary to avoid damage from the *Pseudomonas solanacearum* ("slym"-disease). During the 7 fallow years the land becomes covered with a bushy vegetation, which enriches the soil by large amounts of organic matter.

Soil reaction :

In harmony with experience elsewhere (e.g. Connecticut) it was found that Deli-tobacco showed the best development in slightly acid and neutral soils. Grown on more acid soils one often gets a reduced fire holding capacity, probably due to increased uptake of Cl. The

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fact, however, that the *B. solanacearum* also thrives best under same soil conditions, forms a particular difficulty in Deli for a correct soil management. Under alkaline soil conditions the plants are apt to be damaged by toprot which is caused by boron deficiency. In experiments made by VAN DER POEL it was shown that addition of organic manure decreased the damage from the "slym"-disease, while regulation of the soil acidity by the alternate use of physiologically acid or alkaline fertilizers gave promising results.

Soil treatment :

The soil is thoroughly cultivated to a great depth, while care is taken not to mix up the different soil layers. In case of heavy clay soils the cultivation goes as deep as 45-50 cm. The thus prepared soils are kept fallow for a few months.

Tobacco on seedbeds :

The beds are laid in North-South direction and consist of a thick 15-30 cm. layer of surface soil; they are protected by roofing. The surface layer must be firm and have a crumbly structure.

Before sowing the soil is thoroughly moistened and seeds applied towards evening. The seed is mixed with dry wood ashes or water which is evenly spread over the bed. In the first days the soil must be kept moist, watering 4 times a day if necessary. The seedlings emerge after 5 days. The seeds are usually germinated before by keeping them on wet cloth during 2-3 days. Thinning takes place 14 days after sowing, when the remaining plants come to a distance of 5.5 cm. from one to another. After about 40 days the seedlings are 15-20 cm. high and ready for transplanting.

Tobacco in the field :

In Deli the tobacco is planted in double rows. Usually the plants stand 45 cm. apart; the distance between the double rows is 1 m. and that between the two rows 50 cm. (about 12,000 plants per acre). A furrow is made in the strip of 1 metre 5 days after transplanting and the soil from these

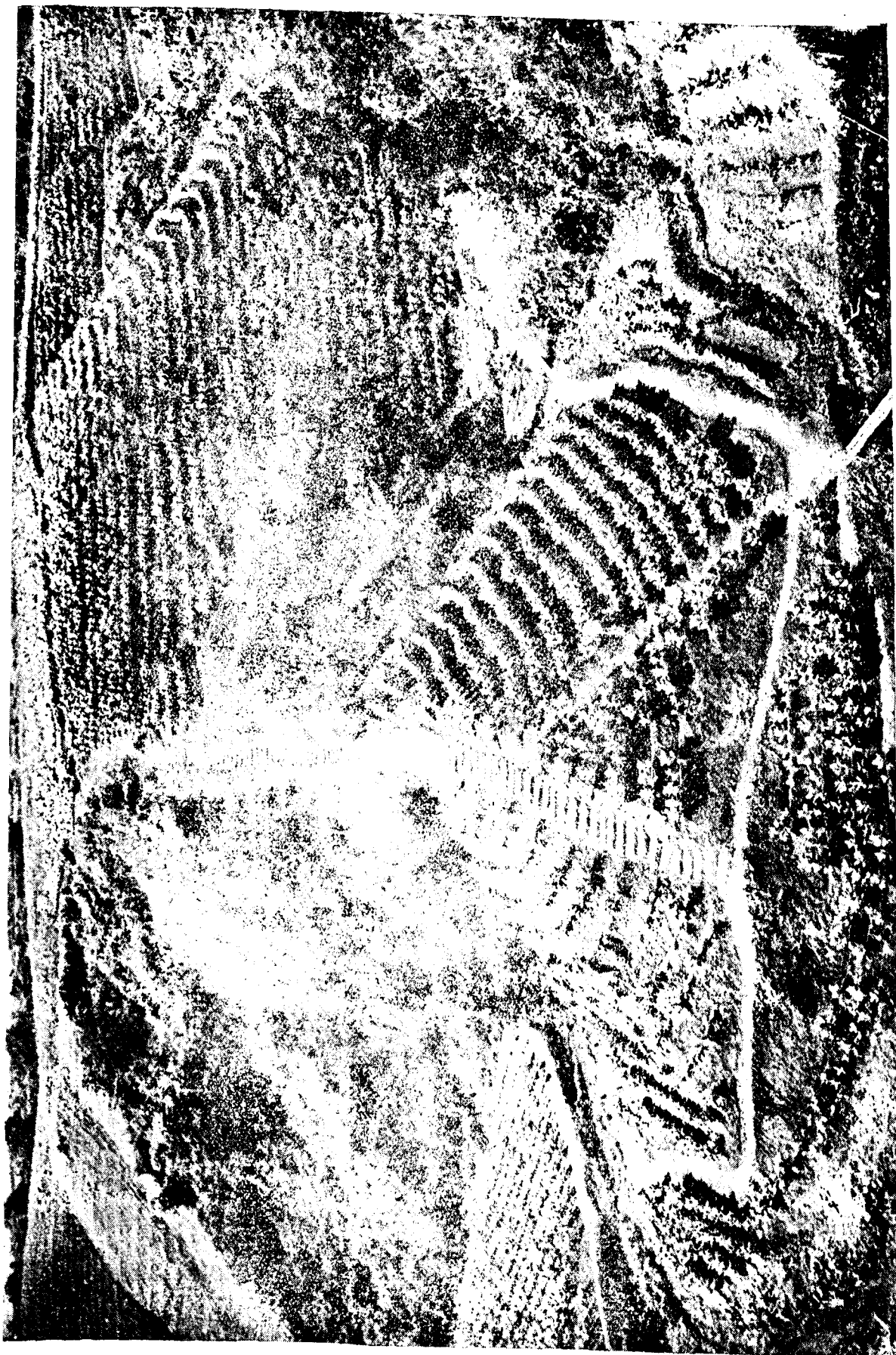


Fig. 2.—Young Estate-Tobacco in Deli. The slopes are well terraced to prevent soil erosion.

M. Rosanov and J. M. Wybenga.

furrows serve to earthen up the plants: 15-20 days after planting the second earthing up is given. The furrows then have a depth of 40-50 cm. On soils with defective permeability the furrows are made even before transplanting to avoid damage from an excess of soil moisture. Growth sets in after the first fortnight following the transplanting. 45-55 days after transplanting the plants are about 2 metres in height with 25-30 leaves whilst buds become visible. A regular distribution of the rainfall between the 14th and 50th day after transplanting is an important condition which has a pronounced effect on the quality of the crop. The Deli-tobacco is not topped.

Fertilization :

The most efficient fertilization, as regards quantities of N, P and K was established long ago in field experiments. Seed beds are usually dressed with 40-50 g of Sulphate of Ammonia, 60-90 g of double superphosphate and 40-80 g of potassium sulphate per m^2 , the quantities depending on the type of soil. It is common practice to add half the dressing in solid form before sowing and the balance dissolved in water as topdressing.

Fertilization of the tobacco in the field is mostly carried out on the day of transplanting and a fertilizer-mixture is applied in the plantholes. For alluvial soils a 5 : 10 : 7.5 mixture is much practised. The normal nitrogen dressing is 0.5g of nitrogen per plant.

It is an established fact that the quality of the final product largely depends on the nutrition of the plant. Cl-ions have an adverse effect on the regularity of the burn, (fire-work) so that muriates are never used for fertilizing purposes of tobacco. In mixture phosphate is mostly supplied in the form of double superphosphate while basic slag which also provides the soil with a certain supply of lime, is often applied as a basic dressing a few weeks before planting. A regular supply of the soil with Ca-compounds proved to have a beneficial effect on the quality of the

tobacco as it tends to decrease the potash contents of the leaves. Too high a potash content of the leaves produced the so-called "wet tops". If we compare the usual K-dressings with those practised in other countries, we must conclude that the Deli-soils are still relatively rich in their potash content. In other centres of tobacco culture much higher dressings are applied and it is always stated that K has a pronounced effect on the fire holding capacity of the final product.

Due to its peculiar climatic conditions and the abundance of land, Deli has always been a centre of tobacco culture which occupied a place of its own and its practices are not quite comparable with those in other tobacco producing countries.

At present the Deli tobacco estates encounter many difficulties which are mainly due to the fact that the status of the long leased lands has not yet been settled in a satisfactory way. The Authorities tend to reduce the area occupied by the tobacco culture which would make it necessary in the future to reduce the 7 years of fallow period in order to keep the production on the same level. As prewar research showed that shortening of the fallow period either resulted in a high percentage of "slym"-disease or in a decreased quality of the next crop it will be one of the first problems to be solved. Addition of organic manure proved to decrease the "slym"-disease. Would this manuring come into common practice, new fertilization standards will have to be devised.

Harvesting :

The start of the picking coincides with the bud formation of the plants. One picks two leaves from each plant, every 4-5 days, in the morning hours from 5-30-10 a.m. The leaves are separated according to types :

Sandleaf	4-6	leaves per plant
Pre-harvest	6-8	" " "
Middle harvest	6-8	" " "
Post harvest	2-4	" " "

The leaves are dried in barns which have a storage-capacity of 1 million leaves each. The drying process takes about 3 weeks; then the leaves are fermented and sorted according to about 50 different qualities. Formerly the occurrence of spots on leaves was considered to be a characteristic of maturity, but it was established later that this was a disease caused by a fungus. (*Cercospora nicotianae* L.).

Besuki tobacco (E. Java) :

As can be seen from the comparison between the prewar prices of the different centres Besuki produces cigar-tobacco's of the lowest grades. The lands are hired from the native population and the tobacco is planted in the dry period after the harvest of the paddy. Due to this particular system of cultivation it was difficult to maintain the desired quality standards. Variable soil properties and the impossibility of carrying out permanent measure of soil improvement, made the product also varying in its properties, the lower lands have often shown too high contents of Cl so that good drainage was found of great importance. Two types of tobacco are produced; the Kedu-type which gives a tobacco with a fine sort odour and taste and the Hybrid-type selected by the Exp. Station at Djember which produces leaves not only suitable for binders but also for wrappers. The tobacco is planted in single rows with approximately 7000-7600 plants per acre depending on the type grown. As the first growth takes place in the dry season irrigation is necessary. Furrow irrigation is given at regular intervals. Not very much work is published about fertilization practices. On seed beds a rotation with leguminous crops is often practised. Sulphate of Ammonia and potassium sulphate have given bad results owing to their high content of SO_4 . Potassium nitrate proved to be a good but very expensive fertilizer. Good results have been obtained with Chilean Nitrate; Nitrate of lime has also been used although the planters are averse to this product's excessive degree of hygroscopicity.

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Vorstenlanden Tobacco (C. Java) :

This centre was mainly situated on andesitic soils formed by the volcano Merapi. As most volcanic soils they are very varied in age, mechanical composition and situation. The same is true for the tobaccos grown on these soils. It is therefore not accidental that much work has been done by the Klaton Experimental Station to find out the relations between the soils and the qualities of tobacco. Great attention was also paid to the effect of different working methods in the field and factory. In spite of the fact that Vorstenlanden have lost their importance at the moment, a short review of the experience gained in this district must be regarded of value for other tobacco growing countries. One of the first important facts which has been established at Klaten is the effect of organic manure on the yield and quality of tobacco. Furthermore, the effect of increasing doses and the form in which the nitrogen is best absorbed by the tobacco plants have been studied.

Organic manure :

Organic manure was regarded to be indispensable for obtaining a good product although the burn is affected adversely by the Cl-content of farmyard manure. Several trials have been made with substitution of the stable manure by green manure but many difficulties were encountered in introducing this system. The tobacco was planted on hired lands and it was impossible to fit the leguminous crop in the existing system of rotation. After some time of experiments a method had been worked out whereby the leguminous crop (mostly *Crotalaria* species) were sown between the tobacco rows at the moment when the lowest leaves were picked. After the final harvest the *Crotalaria* was cut and stored in the tobacco barns until the next planting season. The dried mass was then worked into the soil as organic manure.

Application of fertilizers :

Besides this system of early manuring, application of commercial fertilisers proved to

Fig. 3.—Curing Barns for Cigar Tobacco.

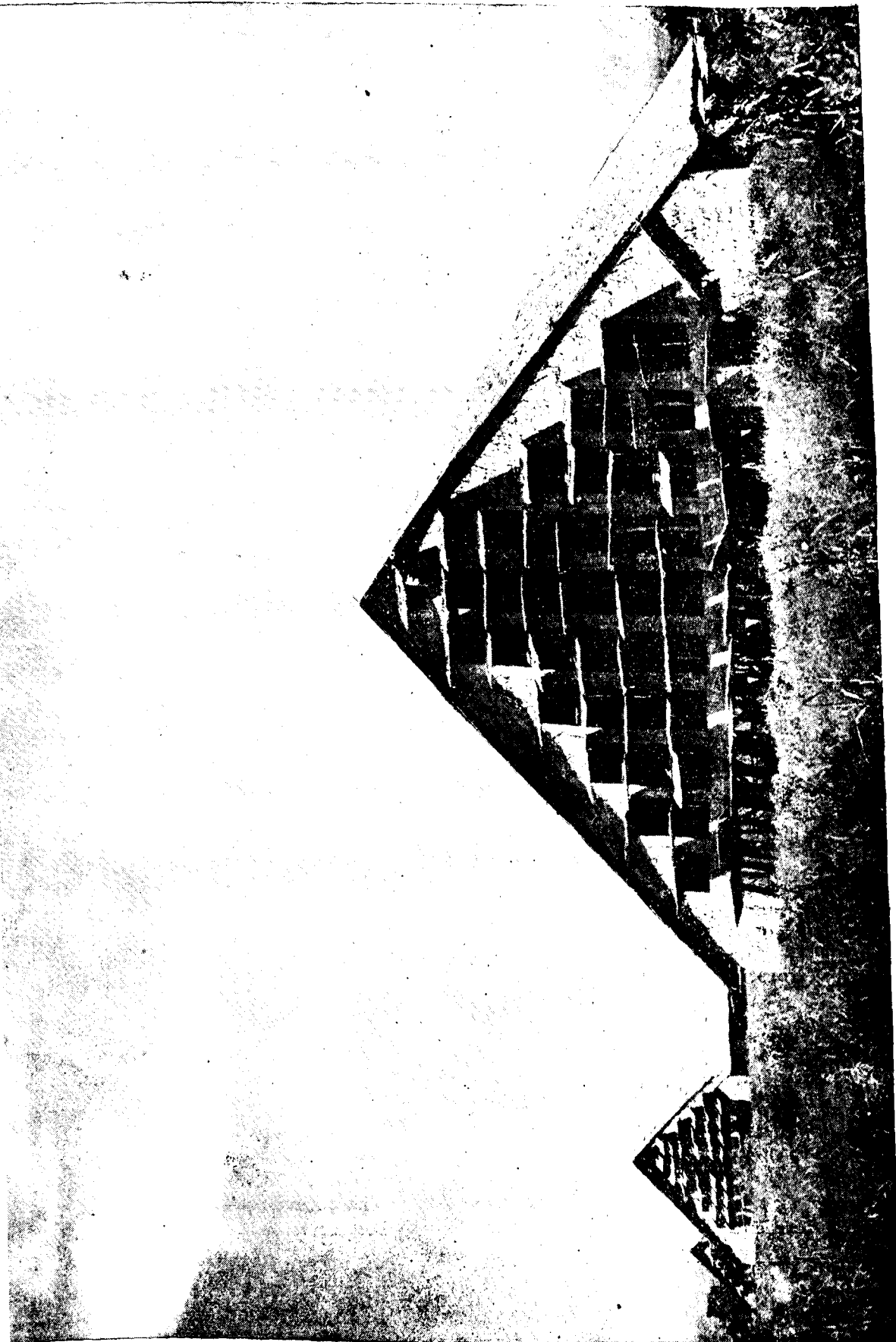




Fig. 4.—Graded and Bundled Tobacco Ready for Final Control.

be beneficial. An extensive study was made of the effect of fertilizers on the grade of the final product which was produced. The best results were mostly obtained with a dosage of 0.6 grams of nitrogen per plant : (occasionally 1.2 grams on poor soils). Tobacco dressed with higher nitrogen dose gave invariably worse qualification. Foliar analyses showed that the highest grades of tobacco correspond with a nitrate-content in the midribs of 2%. On the other hand it was established that rainfall and curing of the tobacco have a pronounced effect on the grade of the final product which often exceeded the effect of the nitrogen dressings. Addition of organic material to the soil proved to protect the tobacco against too high a NO_3 -content of the leaves. This could be explained by assuming that much nitrogen is needed for the biological decomposition of the carbohydrates, which checks the availability of this nutrient, so that a more regular supply is obtained.

As to the form in which the nutrients are applied, it was found that nitrate of potash was a very good carrier of potash and is free of constituents which are deleterious to the quality of the tobacco. A comparison made in the last few years before the war between the effects of Sulphate of ammonia and Chilean nitrate showed that the latter fertilizer invariably produced a product of better quality. Tests of parcels sent to Amsterdam resulted in the following qualifications :

“The colour of the ashes was better, the quality milder, more substantial, brighter, stronger and of a better type than the usually produced grade. Also the burn of Chilean Nitrate tobacco was higher than that of Sulphate of ammonia tobacco”.

Although the cause of this difference has not been explained exactly, it is probable that nitrate nitrogen must be regarded as a better form of nitrogen supply for the tobacco plant, while on the other hand a combination of nitrate with a monovalent ion seems to be more effective than other ways of supply.

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As concerning the first preposition there is much evidence that it is really the case. Many investigators have studied the different effects of several nitrogen compounds. BEAUMONT (U.S.A.) carried out experiments in water cultures with the variety Havana seed and showed that ammonium sulphate was toxic in all concentrations used in the various experiments. In these experiments nitrates were readily assimilated. EVANS and WEEKS experimented with burley tobacco and found that plants of the nitrate series produced nearly twice as much dry matter as the ammonium plants. HUTER (Zurich) comes to the same conclusion. It is shown by his experiments that the uptake of nitrate—or ammoniacal nitrogen by the tobacco-plant is hardly influenced by the H-ion concentration of the growth medium.

The fact that tobacco growers turn to nitrate fertilizers confirms the above mentioned facts. Referring to the effect of different nitrogen fertilizers on the quality of tobacco SWANBACK (Connecticut) states : “The results of all tests lead us to doubt whether sulphate of ammonia should be used in the tobacco mixture”. (“Fertilizing Connecticut Tobacco” Conn. Agr. Ex. Br. Bull. 503 (1947), p. 13).

It is noteworthy that not only with potassium nitrate but also with nitrate of soda good results have been obtained. It is known that the fire holding capacity is determined by the ratio :

$$\frac{\% \text{ K}_2\text{O}}{\% \text{ Cl} \times (\% \text{ CaO} - \% \text{ MgO})}$$

in the leaves' ashes. This connection has been established by COOLHAAS in the Vorstenlanden and by BAILY and ANDERSON in Connecticut and shows that a high content of divalent cations and chlorine decreases the fire holding capacity, while potassium has a beneficial effect. Modern views on uptake of cations by plants make it most probable that the mineral composition of a plant is a reflection of the available cations in the

soil. (ELGABALY, WIKLANDER). Therefore an extra supply of a monovalent cation, such as potassium or sodium will decrease the total amount of bivalent cations in the plant and so improve the ratio—governing the fire holding capacity.

The favourable effect of sodium on the development of tobacco is also mentioned by VERONA (Italy), who describes experiments where tobacco varieties Kentucky, Virginia Bright and Brasile Selvaggio were grown in pot cultures with different nitrogenous fertilizers and K-levels. The results show a marked difference between the plants grown with nitrate of soda and nitrate of lime. Even when no potassium was applied nitrate of soda dressing produced normal plants while in the nitrate of lime pots plants failed to develop sufficient growth. (According to the Annual report of the Canadian Experiment Farm Service 1949-1950 similar results were obtained in Canada).

SUMMARY :

The given description of the cultivation practices in Indonesia shows a distinct conformity in general conditions which can be summarized as follows :

1. Soils :

In general, light loamy and sandy soils are preferred for tobacco culture. Young volcanic material is preferable to soils of older origins. A good drainage is necessary.

2. Irrigation :

In Delhi tobacco is grown on non-irrigated lands which is possible through the fact that the rainfall is almost equally distributed between the months of the growing period. In other districts the high quality tobacco is mostly grown on irrigated rice-fields, following the harvest of the paddy. Grown on dry fields the tobacco gives leaves of a thicker constitution, which is not suitable for the cigar industry. Virginia tobacco can be grown

on dry soils providing that the rainfall will enable the plants to give normal development.

3. Fertilization :

In all the culture centres of Indonesia it is understood that a quick growing crop like tobacco needs a regular supply of mineral components in order to produce high yields. The selling price of the final product and the resulting financial result of the culture depend to a large extent on the grade which is produced. As the quantities and the form in which the nutrients are applied have a marked effect on the quality of tobacco, a well balanced fertilization is important.

Recent research brought to light that several improvements of the old fertilization practices are possible (green manuring, liming, substitution of ammonium sulphate by nitrate of potash or nitrate of soda), so that it is worth while to continue this line of research.

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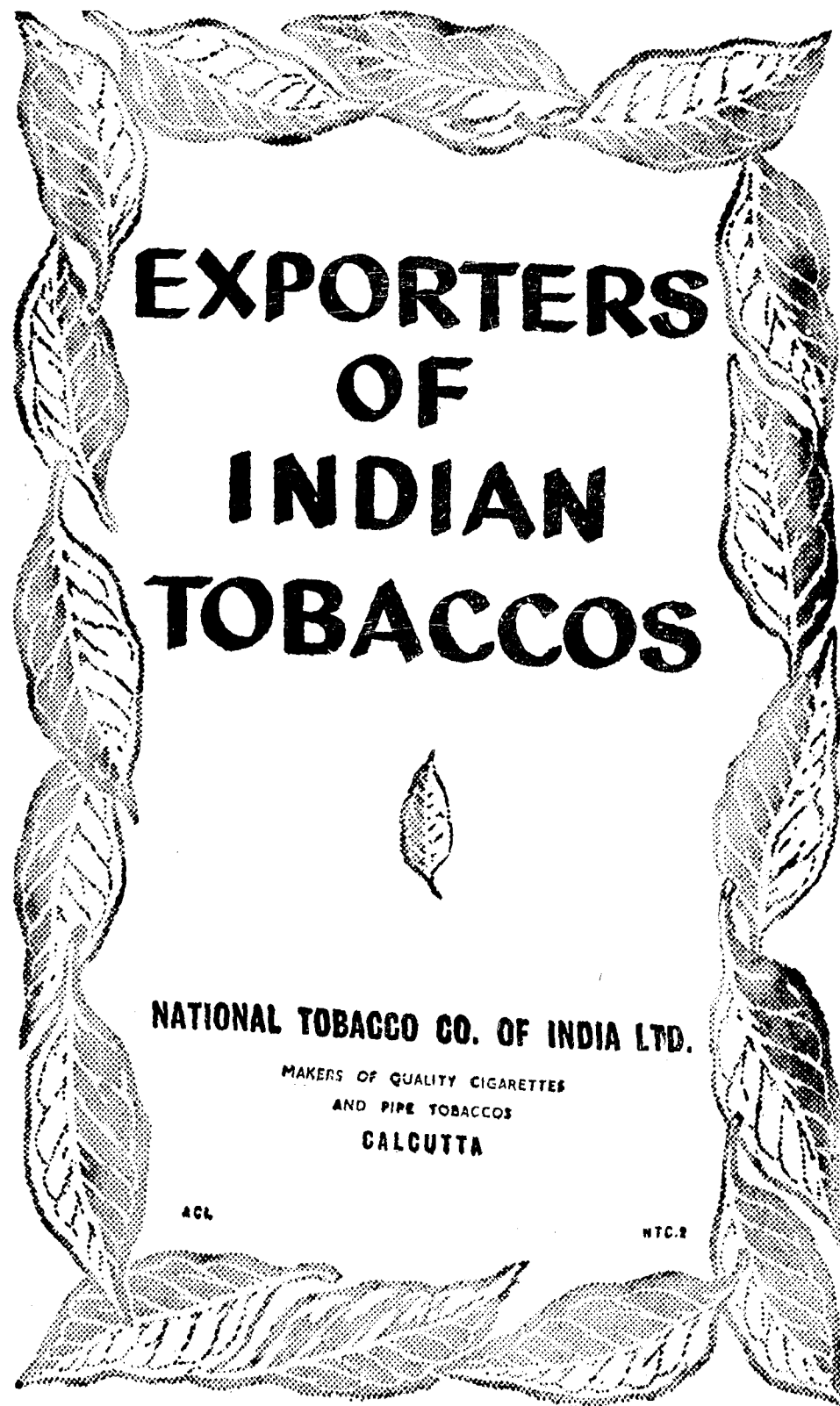
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Samples on application.



Nitrogenous Fertilisation of Cigar Tobacco

H. T. KHEMCHANDANI¹, B. S. KADAM² and A. S. KRISHNAN³

Introduction.

The cultivation of cigar tobacco is mainly concentrated in the districts of Madura, Tiruchirappally and Coimbatore of Madras State. Tobacco in these parts is grown on soils which vary from light gravelly to sandy loam. Cigar or cheroot tobaccos are considered high nitrogen tobaccos, and a liberal supply of nitrogen is essential for high yield and good quality. As a consequence, these tobaccos are manured heavily by the cultivators. The normal practice of manuring is to apply farm yard manure at the rate of 15 to 20 tons (30 to 40 cartloads) per acre. In some cases, sheep and goat foldings are also utilised. Use of artificial fertilisers is not in vogue. In some of the concentrated tobacco growing areas the cost of farm yard manure is very high, ranging from Rs. 7/- to Rs. 10/- for $\frac{1}{2}$ ton or one cartload. More over it is not easily available, with the result that an ordinary cultivator is not able to manure his crop adequately. Excessive use of farm yard manure however does not result in proportionate increase in yield to pay for the high cost of manure. An experiment was therefore begun at the Cigar and Cheroot Tobacco Research Station, Veda sandur, to see how far farm yard manure could be supplemented with a richer nitrogenous fertiliser.

Material and Methods.

In order to determine optimum combination, three levels of farm yard manure and three levels of nitrogen with two sources of nitrogenous fertilisers alone and in equal combinations were studied as detailed below :—

Levels of F.Y.M.

F ₁ =	10 tons	(20 cartloads)	per acre.
F ₂ =	15 "	(30 ")	" "
F ₃ =	20 "	(40 ")	" "

1 and 3 Agronomist and Agricultural Assistant, respectively, Cigar & Cheroot Tobacco Research Station, Veda sandur. 2. Director, Tobacco Research, Central Tobacco Research Institute, Rajahmundry.

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Levels of nitrogen.

N ₀ —	No nitrogen applied.
N ₁ —	30 lbs. of nitrogen per acre.
N ₂ —	60 lbs. " " "
N ₃ —	90 lbs. " " "

Types of nitrogenous manures.

- A — Nitrogen applied in inorganic form as ammonium sulphate.
- B — Nitrogen applied in organic form as groundnut cake.
- C — Nitrogen applied in equal proportion from (NH₄) SO₄ and cake.

The experiment was laid out in a split plot design. The main plots received F.Y.M. treatment and the sub-plots the levels of nitrogen. Each sub-plot was further divided into three ultimate plots which received the three types of manures. Ultimate plots in 1949-50 were 16.5' × 33' and in 1950-51 16.5' × 31.5'. In every plot one row all round was discarded to avoid border effect.

The experiment was commenced in 1948-49 and was repeated for three years upto 1950-51. During 1948-49, which was also the first year of the start of the Research Station, the operations could not be done in time as the land could not be taken possession of. Due to this reason and probably due to extreme soil heterogeneity no differences among various treatments were found. Therefore the results for this year have been omitted from this report.

During the different years, the crop had to be raised in different blocks. The soils in these blocks were light gravelly in texture and well drained.

Farm yard manure was applied about one month in advance of the transplanting and well incorporated in the soil by ploughing. Groundnut cake was applied by broadcast just before transplanting. Sulphate of ammonia was given in two equal doses to minimise leaching, the first half was applied just before transplanting, and the rest at the time of weeding and earthing up i.e., about 35 days after transplanting.

The local variety used in the trial is known as *Vellaiyazhai* (Vellai = white, Vazhai = plantain, i.e., long and narrow plantain like leaf with light green colour).

Experimental results.

The yield data obtained in each year, and the average of the two years were analysed statistically. The summarised yields for main treatment effects are presented in table I.

Table I. — Response of cigar tobacco at different levels of F.Y.M. and nitrogen.
(Yield in lbs. per acre).

Levels of F.Y.M.				Levels of Nitrogen.				Types of Manures.			
Treatment.	49-50	50-51	Avg.	Treatment.	49-50	50-51	Avg.	Treatment.	49-50	50-51	Avg.
F ₁	1220	1450	1335	N ₀	1069	1299	1184	A	1276	1498	1387
F ₂	1294	1566	1430	N ₁	1296	1477	1387	B	1292	1566	1429
F ₃	1368	1587	1477	N ₂	1290	1625	1457	C	1315	1539	1427
				N ₃	1519	1736	1628				
S.E.	82.86	54.1	49.4		42.12	34.0	27.2		26.33	29.4	19.6
C.D. 5%	N-S	N-S	N-S		125.44	104.8	78.2		N-S	N-S	N-S

Conclusions :—

1949-50	F ₃ F ₂ F ₁	N ₃ N ₂ N ₁ N ₀	A	B	C
1950-51	F ₃ F ₂ F ₁	N ₃ N ₂ N ₁ N ₀	A	B	C
Average	F ₃ F ₂ F ₁	N ₃ N ₂ N ₁ N ₀	A	B	C
Seasons	1950-1951	1949-1950			

It was observed that the yield obtained in any year from plots receiving only farm yard manure was generally lower than that secured from plots receiving nitrogen irrespective of the dose of farm yard manure applied. The lowest yield of 1133 lbs. per acre, as the average of two years, was obtained from plots receiving only 10 tons (20 cartloads) of farm yard manure as against the average in the tract of about 1000 lbs. of cured leaf per acre. The corresponding

average yield from plots receiving only 15 tons (30 cartloads) and 20 tons (40 cartloads) farm yard manure per acre were 1149 and 1270 lbs. respectively. Considering the high cost of farm yard manure (the increase in the dose of farm yard manure from 10 to 15 and 20 tons would cost Rs. 70 to Rs. 140 more) the increase in the yield, which was only 16 lbs. to 137 lbs. was quite low and not economical.

The main response of yield of cigar tobacco was to the different levels of nitrogen. The response due to nitrogen was of the ascending order i.e., each higher level of nitrogen generally gave more yield than the lower level. Application of nitrogen was significantly better than no nitrogen. Of the different levels of nitrogen, 90 lbs nitrogen per acre gave significantly higher yield than 60 lbs. or 30 lbs. nitrogen per acre. Between 60 lbs. nitrogen and 30 lbs. nitrogen generally there was no significant difference in 1949-50 though in 1950-51 60 lbs. dose gave significantly higher yield over 30 lbs.

The average increase in the yield under 90 lbs. nitrogen over 60 lbs., 30 lbs. and no-nitrogen plots was 171 lbs., 241 lbs. and 444 lbs. or in percentages 11.7%, 17.4% and 37.5% respectively.

In the experiment, no-nitrogen plots were not actually the no-manure plots. In fact, these plots received varying doses of farm yard manure e.g., 10, 15 or 20 tons as the case was. In the field, plants in the plots receiving no nitrogen, looked nitrogen starved, in varying degrees, as was indicated by the yellowing and stunted growth

of plants. Where, however, 60 lbs. or 90 lbs. of nitrogen was applied, no visible signs of nitrogen starvation were seen. Evidently, even 20 tons (40 cartloads) of farm yard manure in combination with 30 lbs. of nitrogen did not seem to meet the full nitrogen requirements of the cigar tobacco crop. Normal good growth was obtained when 90 lbs. of nitrogen was applied irrespective of the levels of farm yard manure or types of nitrogenous manure.

The absence of any significant response by increasing heavy doses of farm yard manure e.g., 15 tons and 20 tons, over that of 10 tons, was attributed to admittedly slow acting nature of farm yard manure. It was inferred, that, all the nitrogen in farmyard manure may not have become available in the first season of its application, in which case, the farm yard manure may have residual effect. To assess this, in the following season, after tobacco, a crop of dry cholam (*Andropogon sorghum*) was raised in 1949-50 and in 1950-51 irrigated cumbu (*Pennisetum typhoides*) was grown after tobacco. The yields were compiled for main plots only. Summarised data are presented in table II.

Table II. — Residual effect of F.Y.M.
(Yield in lbs. per acre).

Treatments.	1949-50	1950-51	
	Cholam ears.	Cumbu grain.	Cumbu straw.
F ₁	2431	1113	5349
F ₂	2576	1185	5016
F ₃	2431	1335	5698
S.E.	121.3	64.9	256.3
C.D. @ 5%	Not significant.		
Conclusion	F ₂ F ₃ F ₁	F ₃ F ₂ F ₁	F ₃ F ₁ F ₂

These results indicate that there was no significant residual effect in any year.

Quality :—

Quality of cigar tobacco in the present context relates to the elements of smoking, e.g., the fire
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retention capacity, uniformity of burning, ash colour, aroma and flavour. This was determined by actually smoking the cigars made out of tobacco obtained from different treatment plots. Out of three replications, samples were taken from two replications consisting of 3 cigars

from each plot. The opinion was thus based on the average of 6 cigars made from the same grade of tobacco. The tobacco was graded according to the position of leaf on the stalk and for testing, leaves obtained from middle 1/3 section of the plant were taken.

The quality of tobacco in general was good all through. However, F_1 appeared better than F_2 or F_3 . Similarly N_3 seemed better than no nitrogen. There was no difference between different forms of nitrogenous manures, though, addition of groundnut cake seemed to improve the aroma and flavour of tobacco.

Under higher nitrogen doses, leaf was larger in size and there was a tendency on the part of the buyers to quote a little more, about Re. 1

per maund of 25 lbs., for tobacco obtained from plots receiving 90 lbs. nitrogen than plots receiving only farm yard manure.

Economics of Manuring :—

The table below gives the gross money return per acre in rupees under different manuring systems. It is at once seen that the local practice of manuring (20 tons of f.y.m.) is not at all economical and the increase in income by adopting the other three manuring systems ranges from Rs. 188 to Rs. 220. The highest net return is obtained with the manuring system of 10 tons of f.y.m. with 90 lbs. nitrogen as groundnut cake. It thus appears that it will be economical to reduce the application of f.y.m. to about 10 tons (20 cartloads) and supplement it with 90 lbs. nitrogen as groundnut cake.

Table III.—Gross money return per acre under different manuring systems.
(in rupees).

Treatment.	Cost of manures per acre.			Yield in lbs. per acre.			Gross income per acre.			Average net return.
	1949-50	1950-51	Average.	1949-50	1950-51	Average.	1949-50	1950-51	Average.	
$F_1 N_0$ 20 tons of F.Y.M.	280	283	282	1156	1401	1278	658	553	806	249½
$F_1 N_3 A$ 10 tons of F.Y.M. 90 lbs. N. as ammonium sulphate.	213	218	216	1378	1589	1484	784	1081	933	449
$F_1 N_3 B$ 10 tons of F.Y.M. 90 lbs. N. as groundnut cake.	250	313	281	1316	1904	1610	749	1295	1027	470
$F_1 N_3 C$ 10 tons of F.Y.M. 90 lbs. N. in equal proportions of ammonium sulphate and cake.	232	265	248	1564	1504	1534	890	1023	957	438

Discussion :—

Farm yard manure is an important source of humus for the soil. The importance of humus on soil structure in the utilisation of manurial nutrients on the various biochemical processes in the soil, and on soil fertility in general are well known. Maintenance and building up of soil

humus is therefore essential in building up soil fertility.

Cigar tobacco soils in these parts are light gravelly and generally deficient in humus. High temperatures, sandy open nature of the soil and its repeated cultivation are conducive to quick depletion of organic matter by oxidation. The

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rate at which organic matter is lost from the soil increases, as the organic content of the soil is increased, and the maintenance of humus at high level becomes not only difficult but also expensive. Thus, frequent smaller applications of farm yard manure as a source of humus are preferable to heavy applications. In the experiment the addition of 15 tons or 20 tons of farm yard manure did not give any significant increase in yield over that of 10 tons of farm yard manure, nor was any residual effect seen. In the absence of any chemical analyses of the treated soils, it is not possible to say why higher doses of F.Y.M. do not give any residual response.

Experiments at the Ohio Agricultural Experimental Station indicated that smaller applications of farm yard manure not only were economical but also resulted in greater recovery of manurial fertilisers in the crop, than higher applications.

It thus appears that it would be economical to reduce the application of farm yard manure to about 10 tons (20 cartloads) and supplement it with 90 lbs. of nitrogen applied as ammonium sulphate or groundnut cake or the mixture of the two. With the present high cost of farm yard manure, this would result in an additional income of Rs. 188 to Rs. 220 per acre over that of the local practice of manuring with 20 tons (40 cartloads) of farm yard manure alone.

Summary :—

Experiments on the nitrogen manuring of cigar tobacco with four levels of nitrogen, 0, 30, 60 and 90 lbs. per acre, three levels of farm yard manure, 10, 15 and 20 tons per acre and different forms of nitrogenous manures, ammonium sulphate, groundnut cake and the combination of the two in equal proportions was conducted at Cigar and Cheroot Tobacco Research Station, Veda sandur.

Results of two years (1949-50 and 1950-51) indicated that the yield of cigar tobacco increases with higher amount of nitrogen. Highest yield was obtained with 90 lbs. nitrogen per acre and the lowest when no nitrogen was applied, regardless of the farm yard manure application.

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There was no significant difference between different levels of farm yard manure nor was there any residual effect of the high application of farm yard manure. Different forms of nitrogenous manures were also not significant.

Physical appearance and smoking quality of tobacco with 90 lbs. nitrogen was better than no nitrogen. The merchants priced such tobacco about a rupee higher per maund of 25 lbs.

Application of groundnut cake seemed to improve flavour and aroma of tobacco.

Application of 90 lbs. nitrogen as ammonium sulphate or groundnut cake or the combination of the two in equal proportion gave Rs. 188 to Rs. 220 more net returns per acre than the cultivators' practice of applying 20 tons (40 cartloads) of farm yard manure alone.

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NEW CHEMICAL FOUND EFFECTIVE IN CURBING TOBACCO HORNWORMS.

The Agricultural Research Administration has announced that United States Department of Agriculture entomologists had discovered that the insecticide TDE is a safe and extremely effective agent for the control of tobacco hornworms, a major menace to southern leaf crops.

The tobacco hornworm, a destructive green caterpillar three to four inches long, feeds so heavily and moves so freely from plant to plant that even minor infestations can seriously damage a tobacco planting unless aggressive control measures are used.

Applied properly, TDE provides excellent control of these tobacco-destroying insects, although of all insecticides currently known to be effective against hornworms, it is the least hazardous to persons applying it and to crop handlers.

Unlike some other insecticides, its use does not involve the risk of lowering the value of the treated tobacco. Lead arsenate leaves residues of two poisons, lead and arsenic. Benzene hexachloride and toxaphene are known to impart disagreeable odors to the cured tobacco and thus may damage the flavour and aroma of cigarettes.

The use of TDE alone and in combination with the insecticide parathion is described in the new USDA leaflet 336, "Control of Hornworms on Tobacco", which is based on research of the Bureau of Entomology and Plant Quarantine. The leaflet also discusses cultural control methods.

TDE can be used either as a dust or a spray. TDE dust, applied early on a windless day when many of the hornworms are feeding, or a wettable powder or emulsion spray applied with either high pressure or low pressure ground equipment, or by aircraft, will provide excellent control.

TDE should be applied as soon as any small hornworms are found on the tobacco plants. The pests are most easily controlled when they are less than an inch in length. Applications of the Chemical should be repeated whenever a survey of the field shows the pests to be abundant. Usually one or two applications of TDE during a growing season will prevent hornworm damage to tobacco.

TDE also controls budworms on tobacco, and can be used in combination with parathion in a single dust or spray when aphids as well as budworms and hornworms must be controlled.—(*United States Tobacco Journal*—February 9, 1953).

INCREASE IN THE WORLD TOBACCO PRODUCTION.

The world's tobacco production has increased more than 50 per cent. since the years before World War I, whereas the area grown to tobacco has expanded only some 36 per cent.

Since World War II, there has been a marked expansion in area as well as production, mainly in Europe, the Near East, Africa and Latin America, says the U.S. Department of Agriculture. While production in North America has increased substantially in recent years, the area has remained constant. The increase in production of nineteen times in the area of 100 million acres in the Near East, Africa and Latin America, says the U.S. Department of Agriculture.

The increase in production of cigarette types, in particular flue-cured Virginia and light air-cured tobacco, has been remarkable. Production of cigar leaf has been gradually declining since the late twenties.

The expansion of leaf tobacco production has been stimulated by a steady improvement in the price relationship between tobacco and other crops grown on similar soil.

The United States is the largest exporter. However, while its exports account for 40 per cent. of world trade, they only represent 25 per cent. of its production.

Other major exporting countries, such as Turkey, Greece, Southern Rhodesia, Indonesia, Brazil and Cuba export a far higher percentage of their production and are in consequence far more vulnerable to surplus marketing problems.

("Tobacco" London—March 1953).

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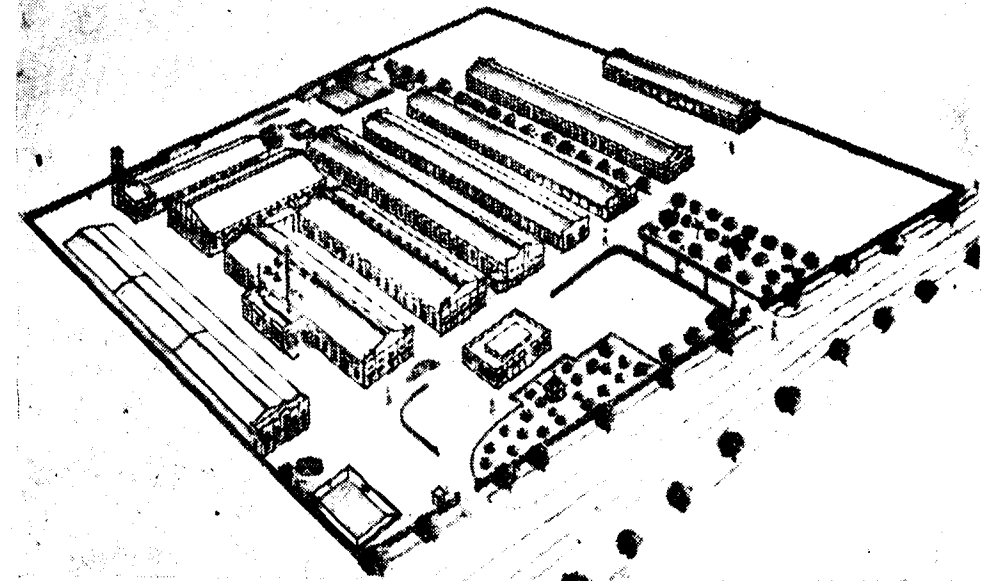
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