

CTMC AGRICULTURAL RESEARCH PROGRAM

Referring to Minute No. 5 of the CTMC Meeting Jan. 31, 1973, this memorandum presents the plans that have evolved for the ITPL Practical Experimental Farm. These plans reflect the views that were expressed in conversation with representatives of all CTMC companies, the Ontario Growers' Board, CDA Station Delhi, and a number of tobacco farm machinery manufacturers. There is also reference to certain activities of the CDA Station that are directly related to the tobacco sheet project.

Three main topics were discussed extensively -

- 1) Mechanization of flue cured farms
- 2) Reconstituted tobacco
- 3) Quality objectives for flue cured tobacco

I. Mechanization of Farms

The adoption of mechanical harvesting machines has speeded up in the U.S. since the adoption of leaf production quotas based on pounds rather than acres. Canadian growers believe that the wider row spacing required for mechanical harvesters results in a corresponding reduction in yield per acre. The Marketing Board has been unwilling to make a compensating adjustment in allotment for growers who wish to use mechanical harvesters. The Marketing Board is also not prepared to convert to a system of poundage control of allotments.

Members of the Marketing Board expressed the view that the capital cost of going into mechanical harvesting is prohibitive for the great majority of Ontario growers who are not equipped with bulk curing kilns, which are required for most types of harvesters. They felt that attempts should be made to adapt standard kilns for use with mechanically harvested leaf, or a much less expensive alternative curing system is needed. There was agreement that scarcity of labor is a problem to be overcome.

There will be a few mechanical harvesters in use in Ontario, one in Nova Scotia, and possibly one in PEI this year.

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Mechanically harvested leaf may be offered for sale in random orientation, rather than straight laid, in the bales. This may present a problem for some leaf processing plants, if they require straight laid leaf. ITPL has assured the machinery manufacturers and growers concerned, that mechanically harvested tobacco will be evaluated on its merits, regardless of how it is oriented in the bales, by ITPL buyers. It is hoped that this view will be taken by most buying companies, otherwise progress in farm labor saving could be seriously set back.

A mechanical harvester is being purchased for the ITPL farm to be used for two purposes:

- 1) - to gain experience with mechanical harvesting, and to demonstrate the technique to others.
- 2) - in conjunction with the reconstituted tobacco program.

Three Canadian manufacturers of harvesters have been told that they may demonstrate their machines on the ITPL farm if they so wish. Most tobacco on the ITPL farm will be planted at a 48" row spacing suitable for mechanical harvesting, with a closer spacing between plants in the rows, according to recommendations of the CDA Station. This should provide factual answers to the concerns about lower yield/acre with mechanical harvesting.

Two new curing techniques will be tried:

- a) The Johnson Modular Curing System. A development at U. of N. Carolina State, it is intended for use with mechanical harvesters and offers considerable potential in reducing materials handling labor on the farm. This will be the first large scale evaluation of the system outside the University. The system requires that the leaf be cut in pieces approx. 3½" square prior to curing. This, of course, constitutes a radical change in the form of the leaf, and probably in the container in which it is transported from the farm.
- b) Use of a double row stitching machine so that randomly oriented mechanically harvested leaves can be hung and cured in a standard kiln.

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II. Reconstituted Tobacco (ITPL Farm Program)

The objective of agricultural work in support of the tobacco sheet project remains to develop an economical means of growing tobacco for processing into sheet. A major problem has been to determine what leaf qualities are essential to the sheet making process. Since the B.A.T. sheet making process is in an early stage of evolution, no useful guidelines could be set on the basis of practical sheet making experience. In 1972 an alternative procedure of growing tobacco under widely different conditions was adopted, to determine the effect of different tobaccos on the process and the resultant product. Considerable emphasis was placed on the systematic elimination of costly steps in tobacco culture, and on agricultural procedures which would lower cost by an increase of yield. This included the trial of tobacco stalks in sheet making.

Evaluations of the various tobaccos grown have led to the general conclusion that the better the smoking quality of the leaf used to make the sheet, the better the smoking quality of the resultant sheet.

Some of the farm cost cutting experiments led to the trial of rapid air dried rather than flue cured leaf, immature leaf, tobacco stalks. All of these gave inferior smoking sheet. Many of the departures from normal cultural practice led to a substantial reduction in nicotine content. While the B.A.T. research group is endeavoring to develop methods of upgrading smoking quality as part of the sheet making process itself, it was felt that the main thrust of agricultural experimentation in Canada this year should be towards mechanization and simplification of the growing of a quite normal type of flue cured tobacco. B.A.T. however, will explore the effect of a wide variety of leaf types selected from around the world, on sheet smoking quality.

One of the disappointments of the past two years' work was the harmful effect of forage harvesting machines. The leaf becomes badly bruised and the bruising interferes with proper curing, and even results in a marked loss of nicotine. It was the report that leaf, when cleanly cut into pieces, cures normally in the Johnson Modular Curing System, that led to our interest in this system, both for the PRT program, as well as for the production of standard flue cured.

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A summary of experience to date is that the preferred tobacco for use as a raw material for sheet for incorporation into flue cured cigarettes should bear a close resemblance to normal flue cured tobacco. Accordingly the work at ITPL farm will be devoted mainly towards the simplification of the production of a fairly standard type of tobacco, embodying as many cost cutting procedures as possible, consistent with the production of such tobacco. Additionally, however, there will be continued exploration of "rapid air drying", which eliminates the yellowing stage of the standard flue curing cycle.

All tobacco for PRT will be harvested mechanically but in only three primings. Curing will be done in three types of kilns: standard kiln, bulk kiln and Johnson Modular Curing System. The leaf will be dried at the farm to a suitable moisture content for shipment, so that no redrying plant processing is required.

Experience with cost cutting procedures for PRT tobacco inevitably produced parallel ideas for traditional tobacco, so it is not surprising that the difference between the "Farm Mechanization" and the PRT programs is in many instances only one of degree. The farm mechanization program must produce leaf that is acceptable in all respects according to normal commercial standards, but greater liberties may be taken with PRT tobacco.

The experimental plan for PRT and Farm Mechanization may be summarized as follows:

	<u>CURING SYSTEM</u>			
	<u>Bulk Kiln Whole Leaf</u>	<u>Johnson Modular Cut Pieces</u>	<u>Johnson Modular Forage Chop</u>	<u>TCS100 Random Leaves</u>
Rapid Dry	PRT	PRT	PRT	
Flue Cure	PRT FM	PRT FM	PRT	FM

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NOTES: PRT - Tobacco for shipment to BAT PRT 71 project harvested in three primings and dried on farm ready for shipment.

FM - Farm Mechanization studies, harvested in normal number of primings. Flue cured and packed for shipment to auction warehouse.

TCS 100 - To be pursued if hanging random leaves proves feasible and quality of cure is satisfactory.

Forage Chop - To be pursued if preliminary experiments show promise.

All Treatments - Variety Virginia 115, cultivated for mechanical harvester. 48" rows x 20" spacing. Top to 18 leaves.

Reconstituted Tobacco (CDA Station Program)

In 1972 the Station continued to experiment with a very close spacing of tobacco in the field. This permits tobacco to be grown with a minimum of hand labor and agricultural chemicals. The project has been managed with the active participation and collaboration of Rothmans. Tobacco from these experiments has been processed into a PCL type sheet at Ajax Plant. Rothmans were favorably impressed with the smoking quality, although nicotine content is low. Despite certain drawbacks, it was agreed at a joint meeting of personnel from CDA station and from all CTMC companies that this program should continue.

Accordingly, CDA Station is preparing a program, and has indicated there will be a request made to the Council for assistance.

III. Quality Objectives for Flue Cured Tobacco

Nicotine Content

It has been impossible to arrive at clear cut statement of consensus about nicotine. Health authorities are emphatic in the view that the tar and nicotine of smoke should be lowered. Manufacturers, well aware of the

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importance of nicotine to a satisfying smoke, have tended to object to low nicotine tobacco. There are exceptions, as in the case of Germany, where low nicotine tobacco is needed to supply a sizeable low nicotine market. An important reason for the attractiveness of Canadian flue cured to foreign buyers is its relatively low tar/nicotine ratio. Reduction of nicotine content would reduce this quality advantage.

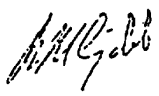
Discussions of this subject have led to a research objective for CDA Station that reflects the current dilemma of thought about nicotine. It was agreed that the research station should study the factors, including varieties, that control nicotine content, so that it will be possible to grow tobacco at the level of nicotine that eventually emerges as being desirable. A start on this program was made in 1972 with the growing of a number of varieties from seed obtained from many parts of the world. This work will continue at the Delhi Station, and a few small plots will be grown on the ITPL farm.

Subjective Smoking Quality

If cigarette design continues to change in the direction of giving less smoke, or more dilute smoke to the smoker, it will become increasingly difficult to achieve a fully satisfying smoke taste. This will be especially true if substantial quantities of sheet are to be used. Accordingly the Delhi Station has agreed to recognize the need for enhanced taste and flavor, when screening candidate tobaccos for introduction into the Canadian breeding program.

Similarly, the point was made that agricultural practices that enhance the content of fully ripe tobacco in the Canadian crop, are desirable.

May 11, 1973.



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