



Plant Products Division  
Ottawa, June 13, 1966.

YOUR FILE NO.  
VOTRE N.É.F. N°

MEMORANDUM TO: Participating Members of Tobacco  
and Endrin meeting held May 25, 1966  
at Delhi Experimental Farm.

YOUR FILE NO. VOTRE N.É.F. N°	DATE
	-6 JUL 1966
FROM	
TO	
SUBJECT	

Re: Registration of Endrin for use on tobacco

This meeting was called to discuss the possible health hazards which might accrue from endrin residues on tobacco. Several other aspects of hazard due to the use of endrin were discussed such as drift to adjacent crops destined to be food or feed and the possible occurrence of residues, and the occupational health aspects in its application.

With respect to endrin residues on the tobacco itself, there is evidence to indicate that while endrin residues deteriorate rapidly on the tobacco leaf, they will appear in the tobacco even through the flue curing process if applications are made too close to priming or harvest, (1). Residues surviving the preharvest interval and the flue curing process become stable in the tobacco and no diminution occurs during storage. In order to reduce the possibility of residues occurring in the tobacco leaf after curing, the evidence suggests that a 14-day preharvest interval should be imposed on the use of endrin, and this restriction now appears on the endrin labels registered in Canada. This interval corresponds to that which is in force with respect to the use of endrin on food crops, which are monitored by the Food and Drug Directorate, and is still acceptable. Tolerances have not been established on any food crop and few if any violations of this "no tolerance" have occurred that could not be construed as misuse. This use experience supports the approach that a 14-day interval will result in residues of a very low order if detectable at all.

With respect to the health hazard of smoking tobacco containing endrin residues one must consider it as an atmospheric pollutant. The American Conference of Governmental Industrial Hygienists (2) in 1963 established a Threshold Limit Value for endrin at 0.1 mg/m<sup>3</sup>. This value is acceptable today by the Occupational Health Division of the Department of National Health and Welfare. Values for other common pesticides are as follows, Dieldrin 0.25, Heptachlor 0.5, DDT 1.0, Carbaryl 5.0 and Guthion at 0.2. An appraisal of the Safety of Endrin Residues in Tobacco, from Shell Chemical Company dated February 13, 1964, New York 20, N.Y. includes a formula for determining the amount of endrin residue available to the smoker by the following means and is supported by the work of other agencies. It is estimated that 17% of the endrin in tobacco is likely to remain in the main stream smoke, supported by analyses of whole cigarettes and the 1" butts remaining after smoking. Should an individual smoke 40 cigarettes per day Shell calculates

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in agy work.  
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by means of the following formula that 10 micrograms of endrin is available for absorption by the smoker. Weight of 40 cigarettes X 1.5 ppm (assumed residue level) X 17 yields 10 ug. This 10 ug. would be present in the main stream of the smoke. Shell Chemical Company asserts that 80% of the foreign materials inhaled are exhaled, which leaves 20% of 2 ug. of endrin supposedly absorbed per day. To relate the inhaled 10 ug. residue to the Threshold Limit Value for endrin to which a worker may be subjected for 8 hours without detectable deleterious effect the total weight of endrin during the period must be calculated. A sedentary worker will breathe 3.3m<sup>3</sup> of air during 8 hours, and thus be subjected to 330 ug. per day. Thus the cigarette smoker is subjected to 10/330, or about 3% of the acceptable dose established as the Threshold Limit Value.

now probably about 10-12% - W.B.

The above calculation does not suggest that 1.5 p.p.m. endrin should be considered acceptable, but it does help to relate those residue levels present with acceptable industrial norms WHO/FAO reports recommend that every effort be made to keep endrin intake by man at the lowest possible level and the 14-day harvest interval should do much to accomplish this end.

Occupational hazard is a factor to be considered and unless the hazard is inordinately high the precautionary label statements if followed should provide adequate safety. Most if not all endrin has been applied to tobacco from the air and the attendant hazards must be considered. The pilot is subjected to a maximum total exposure of 0.29% of what is to be considered to be a toxic dose, borne out by data developed by the Occupational Health Division of the Department of National Health and Welfare and in close agreement with H.R. Wolfe et al (3). High pressure ground rig operators were subjected to similarly low order of magnitude. The above figures presuppose that normal precautions are taken. The precautionary statement that workers should not be permitted in the sprayed field within 5 days allowed adequate protection based on present data.

Control of drift to adjacent crops is an operational aspect that can be controlled only by applicator and is normally outside the responsibility of the Pest Control Products Act. So long as drift is controllable and it is possible to apply a pesticide without undue concern for adjacent crops, this aspect must be regulated by the operator himself or by provincial authority.

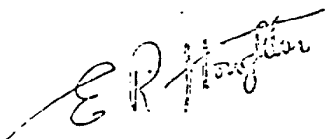
The product endrin is acceptable for registration under the terms of the Pest Control Products Act because it cannot be shown to be a health hazard according to the present data and standards, neither from the expected residue situation with a 14 day harvest interval, nor the occupational hazards if used according to direction.

From the discussions at this meeting it appears that endrin applications prior to the 14 day harvest interval may be largely outside present practice. For those pest control situations on tobacco where protective sprays may be useful, or where early infestations occur, endrin may be

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used to good advantage and should be available for good agricultural practice. Preharvest intervals are established for many pest control programs and selection of pesticides to suit the program and the interval to harvest is normal practice. Local or regional conditions will certainly dictate the procedure to follow and federal registration will continue to permit regional authorities to make the recommendations at that level to further restrict use practices if this is appropriate.



E.R. Houghton,  
Supervisor,  
Pesticide Unit,

ERE/jbn

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