Agriculture Canada

Canada

Food Production and Inspection Branch
Direction générale de la production et de l'Inspection des aliments

Pesticides Directorate
Direction des pesticides

Note to CAPCO C90-10

WOOD TREATMENT MATERIALS

Various products have historically been used to protect wood from decay organisms. In more recent times, the materials of choice have been broad spectrum products that are active over a long time frame and in a wide range of settings or circumstances, for example, copper chromium arsenate (CCA), creosote and pentachlorophenol. Unfortunately, these positive performance attributes are frequently associated with other inherent characteristics that are less desirable, such as toxicity to aquatic organisms, chronic health effects, and complex or ill-defined chemistry.

Wood treatment can be divided into three main sectors or use areas:

- sapstain applications
- heavy duty industrial applications
- specialty applications (e.g., home and garden products, wood joinery applications, remedial groundline treatments, etc.).

PUBLIÉ AUSSI EN FRANÇAIS AUGUST 1, 1990

This bulletin is published by the Pesticide Information Division of the Pesticides Directorate. For further information, please contact:

Pesticides Directorate
Agriculture Canada
Ottawa, Ontario

K1A 0C6
(613) 993-4544

Facsimile: (613) 998-1312
Telex: 053-3282
Envoy 100: Pesticide
National Pesticide Call-Line: 1-800-267-6315

SAPSTAIN

Introduction

Fresh sawn softwood lumber is generally treated with a pesticide (antisapstain chemical) to protect it from surface mold and fungal deterioration during transportation and prolonged storage. Over 3.6 billion board feet of coastal softwood lumber from British Columbia were treated in 1986 with antisapstain chemicals. This treatment is essential to meet lumber quality requirements for export markets.

The use of chlorophenate chemicals, the traditional protectants, has become controversial, both in Canada and elsewhere, particularly in relation to three concerns:

- potential carcinogenicity;
- dioxin contamination; and
- toxicity to aquatic organisms.

Many alternative chemicals to the chlorophenates do exist. Three are currently registered in Canada, under the Pest Control Products Act, namely, TCMTB, Copper-8 and borax. However, these alternatives do not effectively control the full spectrum of organisms. Furthermore, their health and environmental data bases do not meet current Canadian registration standards. Several additional replacement chemicals are required to control the broad range of sapstain organisms occurring on the various wood species encountered in Canada.

Although registered and used in a number of other countries, none of the alternative antisapstain chemicals have the comprehensive data base normally required for registration in Canada under the Pest Control Products Act.

There are two types of regulatory approaches commonly used in Canada and internationally:

- A complete package of scientific studies supporting a generally acceptable course of action.
- A less than ideal science data base frequently associated with controversial decisions that nevertheless must be made.

To deal with the dilemma posed by the latter type of situation, agencies world-wide often make use of regulatory management techniques.[1]

Federal departments have been working for some time to introduce regulatory management principles to strengthen the pesticide decision making process. Progress in this initiative has been gradual, but steady, over time. The current sapstain example represents the most ambitious application of this regulatory management approach to date, in terms of federal involvement and stakeholder participation.

Background

In 1989 Agriculture Canada - in cooperation with Health and Welfare Canada, Environment Canada, Forestry Canada, and the Department of Fisheries and Oceans - prepared a Draft Discussion Document on Antisapstain Chemicals.

The Draft Discussion Document:

- summarizes the scientific studies on a series of compounds identified, in consultation with the Council of Forest Industries for British Columbia (COFI), as chlorophenate replacement products;[2]
- provides an update on new or additional health and safety information that had emerged over the previous 18 months on pentachlorophenol (PCP);
- includes a value assessment prepared, under contract for Forestry Canada, by Deloitte Haskins and Sells International, with the assistance of the forest industry; and,
- identifies some possible regulatory options.

In November 1989, Agriculture Canada (in concert with Health and Welfare Canada, Environment Canada, Fisheries & Oceans and Forestry Canada) sponsored a consultation meeting in Vancouver on sapstain control. Other participants in this consultation included COFI, the B.C. government, labour unions and public interest groups, as well as representatives of primary suppliers of the control products described in the Draft Discussion Document on Antisapstain Chemicals.

Decision Making Process

Although the participants did not reach a consensus on specific chemicals, the November 1989 consultation meeting was worthwhile. Participants were unable to endorse additional alternative chemicals in the absence of full data packages, but were willing to consider this possibility after further review by an independent multi-stakeholder forum (MSF), with representation from:

The British Columbia Ministry of the Environment
The British Columbia Ministry of Forests
The Canadian Paperworkers Union
The Council of Forest Industries of British Columbia (COFI)
Earthcare
The International Longshoremen's and Warehousemen's Union
The Industrial Woodworkers of America (IWA) - Canada
The Pulp, Paper and Woodworkers of Canada (PPWC)
The Sawmill Industry of British Columbia (COFI Members)
The West Coast Environmental Law Association (WCELC)
The Wharf Operators of British Columbia

_____

1 This approach entails scientific and public policy components, and utilizes consultation and communication in an effort to reach a best-balanced decision.

2 TCMTB, Cu8, Borax, Bardac 22, Polyphase, NP-1, Azaconazole (see Table III). Decision Making Process

Although the participants did not reach a consensus on specific chemicals, the November 1989 consultation meeting was worthwhile. Participants were unable to endorse additional alternative chemicals in the absence of full data packages, but were willing to consider this possibility after further review by an independent multi-stakeholder forum (MSF), with representation from:

The British Columbia Ministry of the Environment
The British Columbia Ministry of Forests
The Canadian Paperworkers Union
The Council of Forest Industries of British Columbia (COFI)
Earthcare
The International Longshoremen's and Warehousemen's Union
The Industrial Woodworkers of America (IWA) - Canada
The Pulp, Paper and Woodworkers of Canada (PPWC)
The Sawmill Industry of British Columbia (COFI Members)
The West Coast Environmental Law Association (WCELC)
The Wharf Operators of British Columbia

Federal government efforts in preparing background documentation (the Draft Discussion Document) and hosting the November 8, 1989 consultation, were a prerequisite to formation of the MSF.

Federal departments involved were pleased to see this independent initiative and committed to carefully consider any advice, counsel or suggestions that would emerge from this process.

The MSF, established late in 1989, has already met several times and has also engaged its own private consultants to assess the supporting scientific studies. These assessments, available from the MSF Chairman[3], were consistent with those developed by federal government scientists and summarized in the Draft Discussion Document on Antisapstain Chemicals.

Arising from these discussions has been a position developed independently by the MSF, with no direct involvement of the federal officials. This position reflects careful consideration of the existing knowledge base by a majority of the interest groups represented on the MSF and by their contract consultants. Against this background, there is little reason for the federal response to run counter to the majority view and expressed wishes of the MSF whose members are likely to be the first affected and most directly impacted by whatever direction is adopted.

Agriculture Canada will continue to pursue the fullest possible scientific evidence to demonstrate the safety, merit and value of pesticides. However, at the same time, the Department recognizes that it is not possible to provide infallible assurances of infinite safety, even with today's intensive testing procedures and the Canadian government's high standards.

---

3 William Leiss & Associates Ltd., 2229 Oak Street, Vancouver, B.C., V6H 3W6, Phone: (604) 734-1020 Fax: (604) 734-0731

Situations are frequently encountered where products are widely used and accepted internationally as pesticides or, in non- pesticidal applications, accepted as having no recognized hazards or known risks. Nevertheless, these same products may have information gaps when measured against the high standards set for the registration of pesticides in Canada. The incremental risk involved in extending coverage to include pesticidal uses is likely to be perceived as acceptable, particularly if the material is intended to replace registered pesticides that have become linked to clearly defined and recognized risks.

Circumstances such as these may well support, in the public interest, a decision to register certain pesticide products using regulatory management decision making principles, supported by full public disclosure of information, along with consultation and communication with affected parties of interest.

Agriculture Canada has led initiatives to develop and introduce this type of decision making process. The Department will continue efforts to develop and apply these principles. While this process requires extensive time and energy, it is seen as a useful alternative for major, critically important user situations that are not fully supported by complete data packages. This approach to decision making is widely used in other countries and has been applied in this case, dealing with new antisapstain materials, as well as in other areas.

Results

The outcome emerging from this particular effort on antisapstain chemicals has been a majority expression of support by the MSF focusing on:

- registration of products containing DDAC and IPBC, as additional antisapstain alternatives, recognizing existing limitations in the current science base;
- re-evaluation of products containing the active ingredients TCMTB, copper-8 and borax;
- establishment of a B.C. provincial health protection and monitoring committee (union and industry members) to oversee the collection and analysis of information on worker health effects. This information will enable industry to adjust technological practices to enhance worker safety;
- cooperation of the B.C. Ministry of Environment in establishing appropriate effluent standards for registered antisapstain chemicals;
- on-site training and education program for mill managers and workers.

The MSF Report[3] reflects the interests and informed input of the majority of the participants. The position developed by the MSF forum did not carry the support of Earthcare, The Pulp, Paper and Woodworkers of Canada (PPWC), or The West Coast Environmental Law Association (WCELA).

The PPWC provided a dissenting view focusing on the inability, based on currently available data, to scientifically support definitive conclusions regarding the safety of the new chemicals. Their comments also touched on the relationship between exposure, end-use product concentration, and occupational hazard.

The WCELA also provided a dissenting view based on recognized data gaps and the resultant inability to "declare or establish scientifically, that the new chemicals are probably safer to the environment and to workers than the present chemicals."

While these represent minority positions, the PPWC and the WCELA viewpoints are appreciated, particularly in light of the number of end points that must be compared and the range of chemicals involved.

The risk associated with any treatment is by definition a function of the hazard inherent in the product and the degree of exposure to that hazard. Worker exposure is reduced and, conversely, protection of health and safety enhanced, by new closed system application technology which is now common in many mills.

The diversity of practical situations encountered (e.g., wood species, weather conditions, application techniques ranging from dip tanks to spray boxes) necessitates availability of a range of end use product concentration options. Engineering design of the application system (e.g., vented spray boxes) responds to this reality by minimizing exposure to concentrated solutions while producing a finished product (i.e., treated lumber that is virtually "dry") thereby reducing the potential worker exposure during subsequent handling. Regardless of the product concentration and application technique, actual dosages are targeted for a standard application of active ingredient per unit surface area (i.e., micrograms (ug) of active ingredient/cm^2 of wood).

It has been recognized from the outset that the data base currently available could not provide complete scientific support for any final decision on the relative overall safety, to the environment and to workers, of the various antisapstain chemicals. This situation is evident in reviewing the fact base described in the Draft Discussion Document and was highlighted during the November 1989 consultation meeting. Independent experts engaged by the MSF reached a similar conclusion.

Awareness of the current data base and ongoing studies were KEY factors in the undertaking, by federal pesticide regulatory authorities, to resolve the antisapstain question on the basis of regulatory management principles (i.e., a combination of science and public policy considerations based on an accepted fact base, plus informed consultations and input). Recognition of the scientific fact base, together with the MSF majority report, has influenced the regulatory position summarized in this Note to CAPCO (e.g., annual review of the temporary registrations and annual monitoring of schedules for additional data).

Advice and input from key stakeholders is an essential component of this approach to decision making. Having benefited from broad consultation, advice, and council, it is Agriculture Canada's responsibility, under the authority of the Pest Control Products Act, to make regulatory decisions and to implement actions arising from them. At the same time, to be acceptable, the selected course of action must also recognize and respect the legitimate interests of all five federal departments involved in, and directly impacted by, the decision.

Against this background, and in the light of input and advice received via the process described above:

1. Registration of all sapstain control uses of tetrachlorophenol and pentachlorophenol in Canada will be terminated, as requested by manufacturers, effective December 31, 1990.

2. Agriculture Canada is:

i) granting temporary registration, subject to annual review, for the following new DDAC and IPBC antisapstain products which are considered essential for effective control of the full range of organisms that cause sapstain in various wood species:

Product Name	Guarantee(%)			
NP-1 (Kop-Coat)	DDAC	64.8	IPBC	7.6
Ecobrite III (Canfor)	SCB	10	DDAC	2
	BOA	2	BNS	2
F2 (Walker Brothers)	DDAC	11.4	BNS	16.8
Timbercote II (Napier Pacific)	DDAC	20		

Additional terms and conditions will also be associated with the registration of the technical active ingredients, DDAC and IPBC, relevant to compliance with schedules for ongoing studies and additional data, as outlined in the Draft Discussion Document on Antisapstain Chemicals. Compliance with these schedules will be monitored annually, as a condition for continuing regulatory status.

As part of the agreement developed by the MSF, the B.C. Ministry of Environment has committed to work cooperatively to establish appropriate effluent standards for registered antisapstain chemicals, in accordance with Section 4 of the B.C. provincial "Antisapstain Chemical Waste Control Regulation".

The B.C. Ministry of Environment will work, in concert with federal colleagues in Environment Canada and in Fisheries & Oceans, to develop technical details regarding appropriate standards, analytical technique and compliance monitoring.

Progress in this area will also be reviewed annually as part of the commitment to a regular re-examination of this important area. Since the MSF intends to continue to function on an ongoing basis, it will be asked to commit to this undertaking, as well as to the education and training programs also discussed under sub-agreement "F" of the MSF Report[3].

ii) formally initiating re-evaluation of antisapstain products containing TCMTB, copper-8 and borax. A great deal of work has already been done in this area, such as the preparation of the Draft Discussion Document on Antisapstain Chemicals.

This best balanced decision will accomplish several major objectives:

- Early phase out of antisapstain use of the chlorophenates.
- Access to the range of products necessary to protect lumber export markets valued at over four billion dollars per year.

- Establishment of sufficient information and options to allow for an informed choice by users to:

  - select products best suited to their specific operations, wood species, etc.

  - switch away from materials that they may have been forced to use (because of the limited range of alternatives available) even though they were not the product of choice in their particular operation or circumstance.

HEAVY DUTY TREATMENT MATERIALS

Pentachlorophenol has received a good deal of study in Canada and elsewhere. Additional data is anticipated via an industry task force focusing on long term human health and environmental effects.

The range of materials available for use in this important sector (e.g., creosote and copper chromium arsenate) will be re-evaluated simultaneously. The intent is to adopt a regulatory management approach similar to that undertaken for antisapstain products. Creosote-impregnated waste materials are being simultaneously assessed under the Canadian Environmental Protection Act (CEPA).

SPECIALTY APPLICATIONS

Pentachlorophenol has also played a significant role in a number of specialty applications including paints and stains, wood joinery products, industrial water treatment products, remedial groundline wood preservatives, oil field biocides and material preservatives.

In response to the June 1987 Pentachlorophenol Discussion Document 87-02 and subsequent events, basic manufacturers of pentachlorophenol have requested voluntary withdrawal of its registration for sapstain use and all specialty applications, with the exception of remedial groundline wood preservatives since discussions are still ongoing about this area of use.

All chlorophenate sapstain control uses will be terminated effective December 31, 1990. Discussions are proceeding with formulators and secondary suppliers of specialty products in an effort to achieve a parallel position in that market sector.

PRODUCT STEWARDSHIP INITIATIVES

Training and Licensing

The largest users of wood treatment materials are concentrated at various commercial facilities across the country. Based on experience in other sectors (e.g., the structural pest control sector) this situation seems to be amenable to similar education, training and, perhaps, licensing initiatives. This approach provides an opportunity for cooperation between government, chemical suppliers and chemical users. It is generally regarded as having contributed to better operating practices and improved safety among professional pest control operators.

Preliminary discussions, regarding a parallel approach in the wood treatment sector, have been positive. This initiative, supported by the MSF, will be pursued via the Canadian Association of Pesticide Control Officials (CAPCO). A good basis for progress already exists in the form of the Environment Canada Code of Good Practice which might serve as a useful Core Manual for education and training. Chemical suppliers and industry/user associations also have useful training and educational materials.

Label Improvement

As part of the ongoing initiatives in this area, Agriculture Canada has been working cooperatively with basic penta manufacturers on a Label Improvement Program (LIP) for the industrial materials (flake and block forms) that are used at commercial wood treatment facilities. The objective is to provide clearer and more specific labelling in the interests of upgrading operating practices and improving safety.

A generic model has been prepared to illustrate current labelling information and format (e.g., use only in industrial facilities for treatment of railway ties, utility poles and exterior construction timber) which carries detailed formulation specific use instructions and limitations.

Upgraded Product Quality for Pentachlorophenol

Hexachlorodibenzo-p-dioxins (HxCDD) have long been recognized as microcontaminants inherent in penta production.

Industry has been working to improve manufacturing technology and quality assurance techniques in an effort to upgrade product quality. HxCDD contamination has been reduced by about 10-fold over the last several years.

Tables I and II outline typical properties and production limits established as registration requirements which characterize penta production relevant to dioxin contaminants. Suppliers are obliged to meet these quality assurance standards.

TABLE I

TYPICAL CHEMICAL COMPOSITION FOR PENTACHLOROPHENOL

	Typical Value	Production Limit
Pentachlorophenol	90 %	86%
Tetrachlorophenol	4.5%	9%
Other related phenols	3 %	6%

TABLE II

CONCENTRATION OF DIOXIN EXPRESSED AS PARTS PER MILLION PARTS PENTACHLOROPHENOL

Hexachlorodibenzo-p-dioxins	<2 ppm	4 ppm
2,3,7,8-tetrachlorodibenzo-p-dioxin	N.D.*	N.D.*

*N.D. = None detectable at detection limit of 0.001 ppm. (No 2,3,7,8-tetrachlorodibenzo-p-dioxin has been found in currently produced pentachlorophenol)

TABLE III

	PRODUCT NAMES	OTHER NAMES
1.	Chlorophenates	PCP, Penta, Tetrachlorophenol, pentachlorophenol, sodium pentachlorophenate, sodium tetrachlorophenate
2.	Pentachlorophenol	PCP, Penta, NaPCP
3.	Tetrachlorophenol	TCP, Tetra, NaTCP
4.	Azaconazole	Rodewod
5.	Copper-8-quinolinolate	Quinolate, Copper-8, Cu-8, Nytek GD, PQ-57, oxine copper, copper salt of 8-hydroxyquinoline
6.	didecyldimethyl ammonium chloride	BARDAC 22 or 2280, DDAC.
7.	3-iodo-2-propynyl butyl carbamate	Troysan Polyphase, iodocarb, IPBC
8.	Mixture of DDAC and IPBC	NP-1
9.	Borax (+ Sodium Carbonate)	Ecobrite, Ecobrite C, CFST, sodium borate, BNS
10.	2-(thiocyanomethylthio) benzothiazole	TCMTB, Busan 30/1030/30 WB
11.	Boric acid	BOA
12.	Sodium carbonate	SCB