OTHER RELATED SUBJECTS

This section provides modules on a number of points which cannot be fitted readily into any of the other sections. They are divided into administrative and scientific subjects.

DECISION-MAKERS, SUPERVISORS AND MEDICAL PERSONNEL:

May need to understand any of the modules in Subjects A and B that are relevant to their work.

Other modules can be inserted under these headings to meet local needs, and can include other aspects of reporting or record keeping.

Module No. VIII A 1
Level: ADVANCED

Section: VIII **Other related subjects**
Subject: A **Administrative subjects**
Number: 1 **Selection of staff**

Main points:

FOR JOBS IN WHICH THERE WILL PROBABLY BE REGULAR OR PROLONGED EXPOSURE TO PESTICIDES, A MEDICAL EXAMINATION BEFORE EMPLOYMENT IS HIGHLY DESIRABLE. THIS PROTECTS THE EMPLOYER AND REMINDS THE WORKER THAT HE WILL BE HANDLING CHEMICALS OF A HAZARDOUS NATURE. IT IS ALSO AN OPPORTUNITY TO ASSURE THE WORKER THAT HE/SHE WILL COME TO NO HARM IF THE CORRECT SAFETY PRECAUTIONS ARE FOLLOWED.

THE MEDICAL EXAMINER MUST CONSIDER WHETHER ANY EXISTING DISEASE MIGHT BE EXACERBATED BY EXPOSURE TO PESTICIDES, OR WHETHER ABSORPTION OF PESTICIDES MIGHT BE INCREASED. RELEVANT CONDITIONS ARE ASTHMA, A SKIN DISORDER ON EXPOSED SKIN, PHYSICAL OR MENTAL NERVOUS DISEASE OR A MAJOR LIVER DISORDER.

IF THE WORKER IS TO HANDLE ORGANOPHOSPHOROUS FORMULATIONS OF MODERATE OR GREATER HAZARD A PRE-EMPLOYMENT CHOLINESTERASE TEST IS ESSENTIAL FOR ESTIMATING HIS/HER EXPOSURE IN THE FUTURE. IT MAY PREVENT UNNECESSARY SUSPENSIONS FROM CONTACT WITH THESE PESTICIDES.

Subsidiary point:

As when exposure to any toxic chemical is likely to occur, the possibility of pregnancy and lactation in female workers of child-bearing age must be considered.

Other information:

For details on the interpretation of cholinesterase tests, see modules VII A 2 and VII B 2.

Suggested visual aid: None indicated.

Module No. VIII A 2
Level: INTERMEDIATE

Section: VIII **Other related subjects**
Subject: A **Administrative subjects**
Number: 2 **Records of exposure to pesticides**

Main points:

WHEN WORKERS ARE HANDLING PESTICIDE FORMULATIONS OF MODERATE OR GREATER HAZARD, BRIEF RECORDS OF EXPOSURE SHOULD BE KEPT.

THE RECORDS ARE OF USE IF THE WORKER SHOWS ANY SIGN OF INTOXICATION BY A PESTICIDE.

Subsidiary points:

1. These records are additional to, or can form a part of a register of operational details. This is always desirable and may be required in some operations.

2. The following table is an example of the form in which the records might be kept.

Name ..... Week beginning .....

Product Applied	Day													
	1		2		3		4		5		6		7	
	H	P	H	P	H	P	H	P	H	P	H	P	H	P

H = Total hours worked in spraying (or bagging or mixing or loading) during day.
P = Number of sprayer tankfuls (pump charges) sprayed, or any other appropriate quantitative index.
Only one column, H or P, need be completed, but it should be consistent for all workers.

Suggested visual aid: Diagram of form to be adopted.

Module No. VIII A 3
Level: INTERMEDIATE

Section:	**VIII**	**Other related subjects**
Subject:	**A**	**Administrative subjects**
Number:	**3**	**Reporting of cases of poisoning**

Main points:

WHENEVER A CASE OF POISONING BY PESTICIDES OCCURS
IT IS IMPORTANT THAT FULL DETAILS SHOULD BE RECORDED.
THIS IS NOT JUST AN ADMINISTRATIVE EXERCISE.
ITS OBJECTIVE IS TO DEFINE THE HAZARD.
TO PREVENT THE WORKER BEING POISONED AGAIN,
AND OTHERS BEING POISONED AT ALL .

Subsidiary points:

The following are the points on which basic information should be obtained. Other points can be added according to local circumstances. The information may have to be collected from several sources before it is complete.

Name, age and sex of the person.
Occupation, spare time occupation.
Date and time of onset of symptoms.
Nature and progress of symptoms and signs.
First aid treatment and referral of case.
Dose and time of any medication given before referral.

Pesticides to which the person might have been exposed.
Common or approved names of these pesticides.
Percentages of pesticides in formulations used.
Method of application.
Exposure of the person, with quantitative data, if possible,
e.g. sprayer tankfuls (pump charges) sprayed, hours of work, wind direction, etc.
Protective measures taken by case, type of clothing worn,
use of washing facilities, etc.
Condition of application equipment.
Any other workers affected.

Details of medical examination.
Results of biological tests.
Treatment given, dosage and times.
Course of case.
Any residual disability on discharge from treatment.
Follow-up.

For discussion:

What are the local procedures for investigating and reporting cases of poisoning?

Suggested visual aid: Text giving details of local procedures.

Module No. VIII B 1
Level: ADVANCED

Section: VIII **Other related subjects**
Subject: B **Scientific subjects**
Number: 1 **Field testing of cholinesterase activity**

Main points:

THE FIELD TESTING OF CHOLINESTERASE ACTIVITY IS NEEDED WHENEVER ORGANOPHOSPHOROUS FORMULATIONS OF MODERATE OR HIGHER HAZARD ARE APPLIED FOR PERIODS OF SEVERAL DAYS OR MORE, OR WHEN ANY WORKER HAS SHOWN ANY OF THE EARLY SYMPTOMS OR SIGNS OF POISONING.

THERE ARE TWO MAIN METHODS,
USING BLOOD FROM THE FINGER OR EARLOBE.

THE FIRST IS A COLORIMETRIC METHOD
A TRAINED TECHNICIAN CAN CARRY OUT 10 TESTS IN ONE HOUR.
ALL THE EQUIPMENT AND REAGENTS CAN BE OBTAINED COMMERCIALLY IN A KIT. THIS METHOD CANNOT BE USED AFTER CARBAMATE EXPOSURE.

THE SECOND METHOD IS SPECTROPHOTOMETRIC,
USING A BATTERY OPERATED INSTRUMENT.
IT IS ALSO AVAILABLE IN A KIT. THIS METHOD IS MORE ACCURATE BUT REQUIRES MORE EXPERIENCE IN ITS USE.
INDIVIDUAL TESTS TAKE ABOUT 3 MINUTES EACH.

Subsidiary points:

1. The ambient temperature in which the tests are carried out must be recorded and adjustments made according to the correction charts available with the kits.

2. Whenever the kits are used, the care and replacement of reagents is essential, and must be budgeted.

Other information:

Details on the cost and availability of the kits and their reagents are available from WHO.

Suggested visual aid: Photograph of a kit, set out.

Module No. VIII B 2
Level: ADVANCED

Section: VIII **Other related subjects**
Subject: B **Scientific subjects**
Number: 2 **Interpretation of results of cholinesterase tests**

Main points:

Organophosphorous pesticides inhibit cholinesterase activity, and results of tests are expressed as a percentage of 'normal' pre-exposure activity of the worker, as this varies widely between individuals. Ideally, the 'normal' value of a man should be the value obtained before he was exposed to any organophosphorous or carbamate pesticide. Otherwise, a community norm is used, or in field testing, the value obtained in the same series of tests on the blood of the technician.

TWO TYPES OF CHOLINESTERASE ACTIVITY CAN BE MEASURED:
THE ACETYLCHOLINESTERASE IN ERYTHROCYTES,
AND THE PSEUDOCHOLINESTERASE IN THE PLASMA.
WHOLE BLOOD CONTAINS MOSTLY RED CELL CHOLINESTERASE,
AND IS ADEQUATE FOR FIELD TESTING.

ANY FALL TO 70% OF NORMAL CHOLINESTERASE ACTIVITY INDICATES A NEED TO INVESTIGATE WORKING METHODS, AND MORE FREQUENT CHOLINESTERASE TESTS ON THE INDIVIDUAL CONCERNED.

SYMPTOMS OF POISONING MAY APPEAR WHEN THE BLOOD OR RED CELL CHOLINESTERASE ACTIVITY IS LESS THAN 35% OF NORMAL.

IF BLOOD OR RED CELL CHOLINESTERASE ACTIVITY IS LESS THAN 50% OF NORMAL, THE WORKER MUST BE SUSPENDED FROM ALL CONTACT WITH ORGANOPHOSPHOROUS OR CARBAMATE PESTICIDES UNTIL THE LEVEL RISES ABOVE 70% OF NORMAL.

PSEUDOCHOLINESTERASE ACTIVITY IN THE PLASMA CAN FALL TO VERY LOW LEVELS WITHOUT EVIDENCE OF SYMPTOMS. THIS ONLY INDICATES UNDESIRABLE EXPOSURE.

Subsidiary point:

For field testing, venous blood is more accurate, but finger-tip or earlobe blood can more conveniently be used. The skin must be carefully cleaned with alcohol to remove any pesticide residues, and the puncture must not be squeezed as this dilutes the sample with plasma.

Suggested visual aid: Text, using words in capitals above.