

Guidelines on procedures for the
REGISTRATION CERTIFICATION AND
TESTING OF NEW PESTICIDE
APPLICATION EQUIPMENT



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BACKGROUND

Since 1995, FAO AGSE has worked to improve the safety and efficiency of pesticides within systems of sustainable agriculture and integrated pest management (IPM). This began with the publication of guidelines to assist member states to control the quality of the most commonly used types of application equipment. The first versions of the FAO guidelines on pesticide application equipment were approved for publication in May 1997 by; the FAO Panel of Experts on Pesticide Specifications, Registration Requirements, Application Standards and Prior Informed Consent; and the FAO Panel of Experts on Agricultural Engineering.

In 2001, FAO AGSE, issued a new, revised and expanded series of pesticide application equipment-related guidelines, which includes this publication. The guidelines in this document outline how governments can influence pesticide safety by controlling the quality of new pesticide application equipment manufactured in or imported into a country. By incorporating into national legislation, a requirement for manufacturers and importers to declare that application equipment meets acceptable, international standards of safety and durability, or to set up national or regional testing and certification procedures, it should be possible to gradually reduce and ultimately to eliminate sub-standard application equipment from farms.

The series consists of the following other guidelines:

Guidelines on minimum requirements for agricultural pesticide application equipment;

An important objective of these guidelines is to assist FAO and other agencies to ensure that sprayers purchased are safe to users and to the environment as well as being efficient and durable in operation. Even the cheapest sprayer models should meet minimum standards of safety and durability.

They take into account equipment that is already on the market, many of which already meet the requirements. The prime objective therefore is that member countries should adopt these guidelines immediately, to begin to eliminate substandard and unsafe sprayers from national markets and ultimately from the international scene.

Guidelines on standards for agricultural pesticide sprayers and related test procedures;

These guidelines are more demanding than the minimum requirements and provide more precise safety targets for spray equipment. They consist of detailed specifications and requirements, supported by test procedures to measure compliance with the proposed standards. The guidelines cover the major types of portable (operator-carried), vehicle-mounted and trailed agricultural pesticide sprayers manufactured in or supplied to FAO member countries.

Guidelines on the organization and operation of training schemes and certification procedures for operators of pesticide application equipment;

These guidelines consider the training, testing and certification of those who actually operate pesticide application equipment. Even the most well designed and maintained sprayer can do immeasurable damage in the hands of an unskilled operator and the importance of these guidelines should not be underestimated.

Guidelines for the organization of schemes for testing and certification of spray equipment in use;

A very important way to improve the safety and efficiency of pesticides is to influence the state of application equipment currently used to apply pesticides on farms. These guidelines draw on international experience to present the requirements, the options and considerations for a country that wishes to introduce this type of scheme.

A further two guidelines in the series cover application of pesticides using aircraft and field crop sprayers and tree and bush crop sprayers:

Guidelines on good practice for aerial application of pesticides;

Guidelines on good practice for ground application of pesticides.

These guidelines have been prepared to offer practical help and guidance to all those involved in using pesticides for food and fibre production or in public health programmes. They cover the main terrestrial and aerial spray application techniques.

1. INTRODUCTION

There is cause for serious concern, especially in the developing world, over the condition of agricultural pesticide sprayers, which are used to apply pesticides. This situation seriously affects the amounts of pesticides used, the way in which they are applied, and in turn the risks to human health and the environment.

With careful use and regular maintenance and checking, well designed, well-manufactured application equipment should continue to perform satisfactorily for several years. However, the reality is that once spray equipment enters field use it is subject to considerable wear and tear and even amongst advanced farmers, servicing and maintenance are often inadequate.

It is fundamental therefore, that new application equipment whether it is imported or manufactured in a country should comply from the outset with adequate standards of safety and quality. Schemes that register, test and certify application equipment as safe before allowing it to be placed on the market for sale, can make a major contribution towards controlling the use of and exposure to pesticides.

The guidelines presented in this document aim to assist countries who do not yet have in place quality control schemes for new pesticide application equipment. These schemes are well within the reach of many countries now that FAO guidelines on minimum requirements and on safety/quality standards are available to all countries. They cover all the major types of application equipment and provide clear and complete compilations of standards at two levels: *Guidelines on minimum requirements for agricultural pesticide application equipment*; *Guidelines on standards for agricultural pesticide sprayers and related test procedures*.

2. POLICY

Governments contemplating the introduction of procedures to control the placing on the market of new pesticide application equipment need first to ensure that the legislation, which deals with the control of pesticides, includes compliance with safety standards and the certification and registration of this type of equipment.

Once the law is in position the regulatory authority responsible for pesticides should formally appoint a suitable organisation or government agency to be responsible for the scheme.

Schemes for new equipment will avoid sub-standard equipment from going on to the market, however it is equally important that schemes are in place to control the condition of sprayers in use. Whilst it is important to ensure that new equipment entering the market is safe, it is equally important that equipment in use on farms is well maintained and operating safely and efficiently. Advice on schemes for application equipment in use is contained in another FAO guideline in this series: *Guidelines on the organization of schemes for testing and certification of sprayers in use*.

In some situations the most appropriate solution is for registration, testing and certification schemes for both new equipment and equipment in use to be run by the same executive authority.

It is important to decide which types of pesticide application equipment should be included in the scheme. In a particular country, vehicle-mounted and trailed (tractor) equipment may predominate and lever-operated knapsack equipment and other operator-carried equipment schemes are not required. The reverse may apply in another country.

Another consideration is whether there is a need for national (or regional) testing centres for new sprayers. An alternative is to request that importers and manufacturers seeking an import licence or a licence to sell in the country should declare that the type and model of equipment involved meets the standards stipulated in the law. In this case, the regulatory body can either arrange random checks of compliance at their own or at other international test centres.

3. REGISTRATION OF APPLICATION EQUIPMENT

In any comprehensive scheme to control pesticides through regulating the sale of application equipment, there is a need to establish a register of those makes and models of new application equipment, which are compliant and are authorised to enter the market.

A further requirement is to know to whom the equipment was sold so that, after a period of perhaps two years, the owners of the individual applicators can be called to submit their equipment for a safety test to obtain certification under a parallel scheme for sprayers in use. There is therefore a need for a register, which identifies the farm location of all units of application equipment in the country, which were compliant when they were new. This represents a systematic way of monitoring the movement and condition of application equipment on farms, which has progressed through the new sprayer approval scheme.

It should be noted that although the above procedure will contribute towards ensuring the safety of application equipment in use, it will not cover units, which are already on farms. The existing applicators will persist for several years therefore other initiatives are required to identify, test and certify this equipment.

The ultimate aim of the regulatory authority should be to establish a record of the entire sprayer population and eventually seek to test and certify compliance of the whole application equipment population at regular intervals. This will be extremely difficult in many circumstances however, in some countries, there are already complete records of all vehicle-mounted, trailed field crop and orchard applicators, that are officially tested every one or two years.

4. RESPONSIBILITIES

In all countries, registration, certification and testing schemes for new pesticide application equipment should be included as a responsibility of government, via the pesticide regulatory authority to minimize the risks to human health and the environment from the exposure to and the release of pesticides.

Efficient schemes can also be run by completely independent, professional bodies such as associations of professional engineers. Their motive is usually to protect the industries which they serve by ensuring high standards of good practice in relation to reduced pesticide hazard and improved productivity, nevertheless, these schemes can be recognised under national legislation and can be forerunners of what eventually become full and effective national or regional schemes. Irrespective of the type of scheme the ultimate responsibility should rest with the regulatory authority.

5. CERTIFICATION SCHEMES

5.1 Choice of scheme

There is no one scheme, which is best for all circumstances. The ultimate aims are to limit pesticide hazards and to minimise the losses that can result from poorly maintained pesticide application equipment.

Several factors will affect the choice of scheme in a country:

- numbers of the different sprayer types in a country or area and their importance in terms of their risk to humans and to the environment;
- the cost and complexity of the scheme and the importance of national testing centres;

N.B. Portable equipment can easily be transported long distances for testing (internationally by air if required) and requires relatively simple test equipment whereas for tractor sprayers transport is more difficult and the test facilities are more sophisticated and costly.

Whichever scheme is chosen, the most important considerations are to have the law in place, a balanced, fair and efficient scheme and to use the law effectively to ensure that equipment coming onto the market complies with the requisite safety standards.

The most common types of pesticide equipment fall into four categories.

I. Portable (operator carried) applicators

Lever operated knapsack sprayer

Motorized knapsack sprayer

Compression sprayer

Motorized mistblower

Rotary atomiser

Thermal and cold fogger

Granule applicator

II. Vehicle-mounted or trailed (tractor) pesticide applicators

Field crop (horizontal boom) sprayer

Air assisted sprayer for tree crops (for orchards and plantations)

Broadcast air assisted sprayer (e.g. cannons)
Granule applicator

III. *Aircraft*

Fixed wing
Helicopter
Mixer/loader (an operator task certification)
Field marker (an operator task certification)

IV. *Others*

Seed treatment
Large-scale batch treatment
Large-scale continuous application (conveyor belt)

5.2 Organization of certification and testing schemes

The authority designated to run any scheme is required to perform the following principal functions:

General:

- design and maintenance of the overall scheme and control of the compliance requirements;
- administration of the scheme (to include publicity, documentation, appeals, certificates, decals (stickers), databases; and fee collection;

Where testing centres are required:

- accreditation of the national testing centres;
- inspection of testing centres and their staff;

- training and certification of the testing staff;
- maintenance of uniform quality and objectivity (Quality Assurance);
- collection of fees and financial administration;

5.3 Testing centres

Where it is decided that new equipment will be tested in a country, centres which carry out the inspection and testing should meet the following requirements:

- officially approved by the regulatory body;
- buildings, which are appropriate for the purpose:
 - protected from weather;
 - clean and ordered;
 - enough space.
- compliant with local environmental requirements;
- equipped to carry out the tests;
- staffed by well-qualified, accredited staff who are competent sprayer inspectors;
- adequate administrative and management ability to participate in the scheme, to forward records to the regulatory authority and to issue certificates of compliance;
- regularly inspected by the regulatory authority or an outside auditor.

5.4 Testing staff

Each testing station should have testing teams of at least two staff who meet the following requirements:

- reliable people with appropriate professional training;
- technical knowledge, skills and experience;
- specific and detailed technical knowledge of the different types of sprayer being tested at the centre and the methodology stipulated.

5.5 Test reports and records

Full details of the test (including a copy of the test protocol containing the results of the inspections and tests), should be sent by the test centre to the regulatory authority, where it should be securely archived. The manufacturer/importer of the sprayer should also receive a copy of the full report.

5.6 Certification

The aim of the regulatory authority is to maintain the integrity of the scheme through a new sprayer certification service by ensuring appropriate, consistent and uniform compliance standards. The granting of a certificate of compliance has considerable value to the applicant and to society. It provides several key benefits:

- official authorization to the manufacturer or importer to sell the certified equipment on the market(s) covered by the scheme
- benefit to the activity for which the application equipment is used (e.g. where quality assured produce is being grown);
- increased public confidence

For all schemes, once a sprayer has passed the official test, or a declaration of compliance is accepted, the regulatory authority should issue a national certificate of compliance.

A certificate should contain certain essential information:

- a unique certificate number
- equipment make
- equipment model
- test report or declaration number
- date of approval

In addition to the certificate, the regulatory authority should also authorise the applicant to purchase weatherproof, durable certification labels, which can be attached to an approved applicator as official proof of compliance, which shows that it has been authorised for sale in the country. The labels (stickers) should incorporate the approval certificate number and the date of approval.

6. COMPLIANCE REQUIREMENTS

Many countries have compliance standards for pesticide application equipment, some of which are rigorously applied via testing centres within the countries themselves. In other cases, regional standards are becoming the norm (especially for vehicle-based (tractor) field-crop and orchard equipment) and regulatory authorities require only a declaration of compliance from an importer of manufacturer to grant a certificate allowing the equipment to enter the market. Where the equipment is found to be in breach of the requirements then penalties are involved.

These arrangements will not be attractive to all countries, especially where the law governing pesticides and its enforcement is not yet in place or practical to enforce.

Whether a country opts for in-country testing or for a declaration from the importer or manufacturer, a regulatory authority can adopt the FAO scheme as its compliance requirement or national standard.

The FAO scheme operates at two levels and the appropriate level for a country will depend on the circumstances and the stage it has reached with its pesticide control legislation and safety schemes. The “minimum requirements” option, which was originally developed to assist purchasing agencies to avoid sub-standard equipment, contains comprehensive requirements and involves careful, consistent inspection and a simple series of measurements and tests to be carried out by trained personnel. The guidelines on standards provide a more precise and rigorous programme with more demanding test procedures in line with current international practice.

Both schemes are based on the modular format, which is illustrated in Figure 1 and Figure 2 for portable and vehicle-based equipment respectively. This modular approach means that new requirements can be introduced easily and uniformly across all the principal types of application equipment.

The FAO scheme therefore provides a convenient approach for the systematic inspection and testing of new application equipment. Comprehensive information on the requirements and test procedures are contained in the relevant guidelines.

7. FINANCING

Most successful schemes are initiated using official funding to provide:

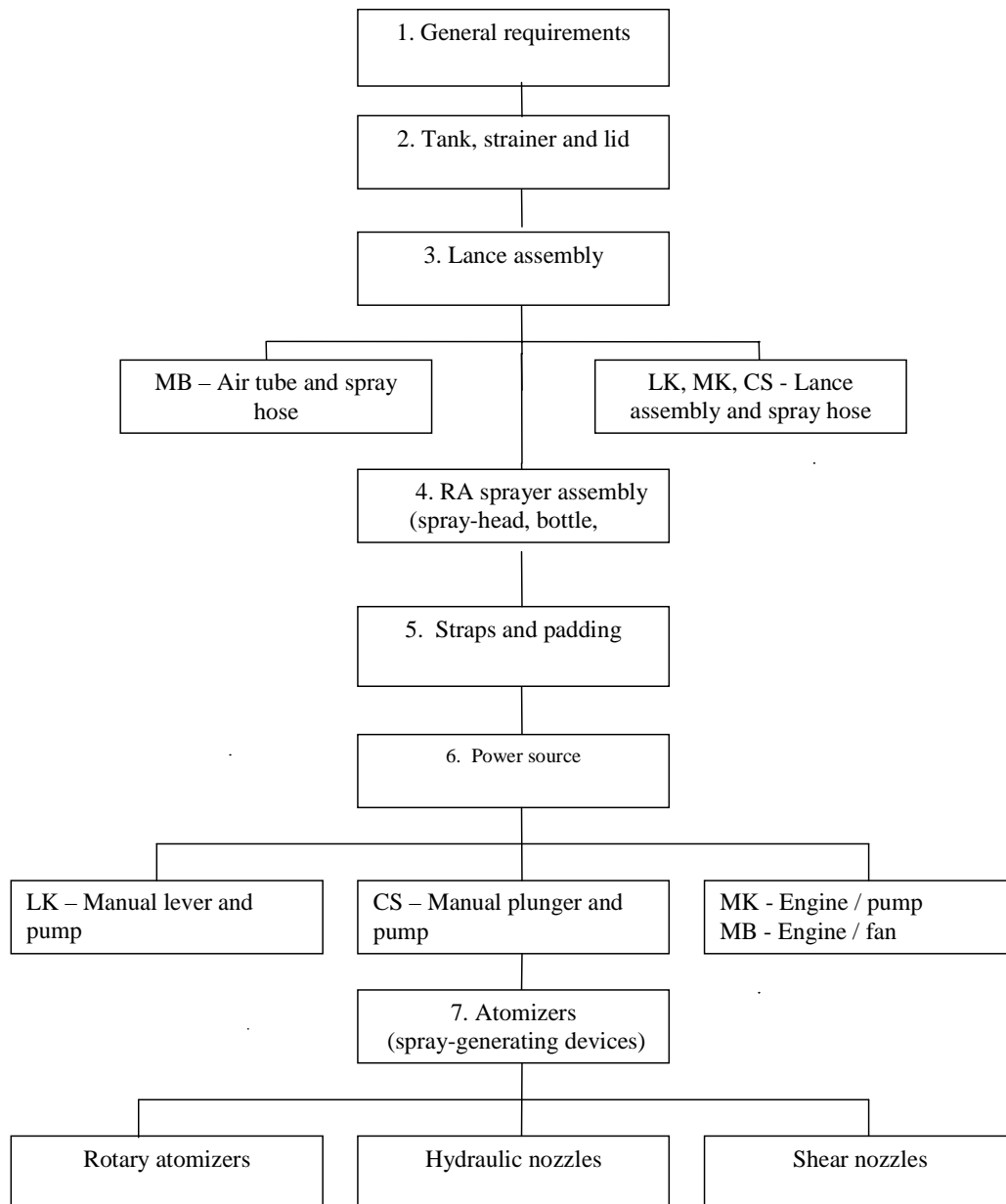
- the scheme design;
- the infrastructure and staffing;
- publicity and promotion to explain the need for and operation of the scheme;
- equipment for government testing centres (when these form part of the scheme).

Once they are running the aim of all sprayer testing certification schemes is to be self-financing and the most obvious route being through fees to the manufacturer or importer for certification, the purchase of official stickers and for tests at national centres where these are required.

To ensure the continued existence of the scheme it is important that, in the planning stages, the cash flows and financial requirements are accurately predicted. It is also important to ensure that the fees charged for the different classes of sprayer are realistic.

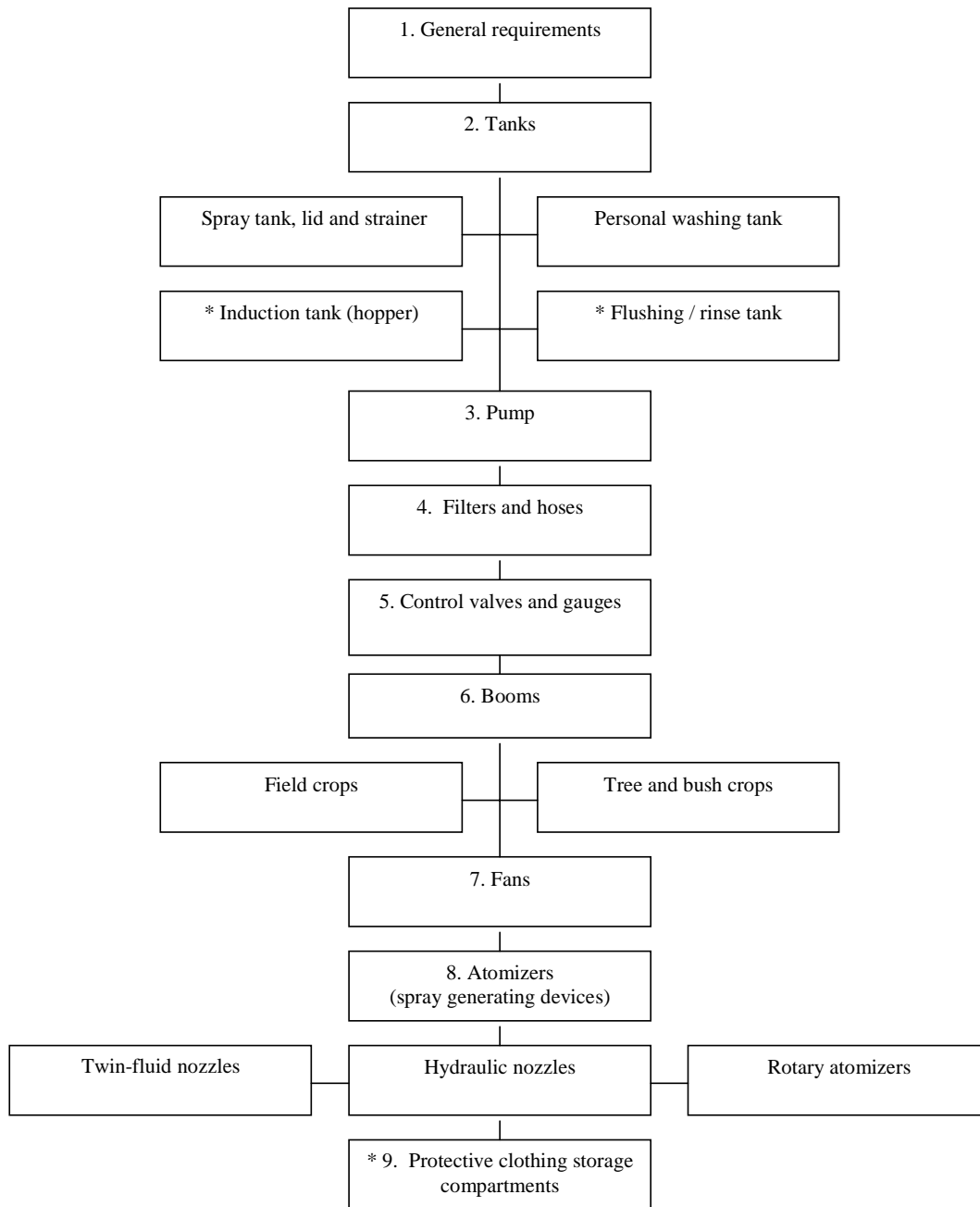
8. QUALITY ASSURANCE

It is essential that schemes suggested in these guidelines are undertaken in an objective and professional manner with provision for a periodic, independent quality assurance audit.

Figure 1- Portable (operator-carried) sprayer component modules

Key: LK - Lever-operated knapsack MK - Motorized hydraulic knapsack
 CS - Compression sprayer MB - Motorized mistblower RA - Rotary atomizer

Figure 2 - Vehicle mounted and trailed sprayer component modules



* required for sprayers with tank volumes over 1000 litres