

## Summary of Discussion Workshop on technical status quo and adjustment procedures of sprayers during implementation of IPM in Poland

T. Baranowski<sup>1</sup>, M. Bzowska<sup>2</sup>

<sup>1</sup> Polish Academy of Sciences - Committee of Plant Protection, Section of Plant Protection Methods and Products

<sup>2</sup> University of Life Sciences in Lublin, and Polish Academy of Science - Committee of Agricultural Engineering

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### Introduction

All European Community member states were obliged to implement the 2009/128/EC Directive into national regulations and practice of Integrated Pest Management (IPM). The provisions of the Directive include, among others, compulsory testing of application equipment, and training and certification of all professional pesticide users, distributors and advisors. Some member states decided to implement related procedures individually years ago, others left these aspects unregulated. Nevertheless, by December 2016, all 28 EC member states are expected to provide a system of procedures and infrastructure for control of spraying systems in use. With the large variety of crops, local agricultural practices, farming business models, and equipment used in crop protection, constructing efficient procedures is not an easy task. European Workshops on Standardised Procedure for the Inspection of Sprayers in Europe (SPISE) support the national efforts by providing a forum for experience exchange.

Assuring quality of the spraying equipment in use is only one side of the problem. It is necessary to take care of the training for the operators and advisors in crop protection. The success of IPM depends on their ability to plan a proper dosage of a right substance, and to precisely conduct the treatment to the maximum benefit of the farmer and the minimum loss to the environment. In this respect, selecting an optimal spraying system and its right settings are of key importance.

### Situation in Poland

In Poland, a system of technical control of sprayers was established in 1999. More than 300 workshops received accreditation for mandatory testing of sprayers. Since the beginning of 2000, more than half a million sprayer inspections were conducted, most of them by means of mobile testing stations. Some of the accredited testing workshops work on seasonal basis (three months in early Spring and three months in Autumn). It certainly allows them to reduce costs, but the control of such testing stations with seasonal working system is much more difficult.

The Polish control system does not provide individual data on each sprayer. Only the number of conducted technical checks (with positive and negative result) is being monitored. For this reason is not possible to get information how many times each sprayer was tested. For the same reason, it is not possible to find out how many sprayers in the population were already inspected, and how many were never subject to tests. Moreover, there is a disturbing difference in the records on the numbers of sprayers in use. Two governmental institutions maintain their independent registers of sprayers. In 2010, the surveys of the Central Statistical Office of Poland (Główny Urząd Statystyczny - GUS) counted over 500 000 sprayers in use, and the Main Inspectorate of Plant Health and Seed Inspection (Państw-

wowy Inspektorat Ochrony Roślin i Nasiennictwa - PIORiN) reported 330 000 sprayers in use.

With regard to standards on professional preparation of people involved in crop protection, Polish re-gulations set requirements only towards sprayer operators' training and knowledge. Crop protection competencies are not required from plant production managers. In practice, the operator is not the person to decide on the selection of pesticides or timing of the treatment. There were reported cases of animal production specialists or agricultural economists taking decisions on plant protection treatments despite their lack of competencies in IPM. Some EC countries developed procedures that could be followed in Poland – for instance, requiring at least one IPM professional to be employed in a farm.

To meet the requirements of Directive 2009/128/EC in terms of spray boom working quality, two checks should be required: determination of cross liquid distribution and nozzle flow rates uniformity. Neither of them provides complete information of liquid distribution system quality, and they are in fact complementary. However, some countries selected only one of these checks as compulsory, and to transpose the Directive they need to change the regulations.

Spraying system nozzles offered on the Polish market as spare parts for agricultural machines are not subject to any requirements and any control, not even the PN-EN-ISO 12761-2 minimal requirement on spray drift control (§4.3.2.  $D_{v10}$  value higher than for reference 110° nozzle at 250 kPa and 0,72 l/min flow rate). There is also no control system of the nozzle spraying class. Some manufacturers claim that nozzles of different design but with the same flow rate according ISO 10625 visiflo color coding automatically belong to the same spraying class (as this parameter is required in pesticide labels). This information is then copied into brochures and manuals published by public institutions. However, there are no standards on the method of spraying quality class determination – so what exactly is understood by the requirements given in the pesticide labels.

Moreover, technical information on nozzles stays without any control. Some technical sources, brochures, manual and electronic devices contain unverified data. Some procedure of nozzle quality control is thus necessary, as there are many cases of inadequate quality of operation. Equipment without full operating guidelines should not be admitted to trading. It is also advisable that the manuals of PPP equipment, including spare parts such as nozzles, were unified under national regulations and PN/CEN and ISO standards.

The process of developing legislation and procedures of plant protection should not proceed without involvement of practitioners. These include not only spraying systems operators, but also sprayer system diagnosticians – experts with considerable experience not only with many designs of equipment available on the market, but also with the operating practices of their users.

Another group able to provide valuable input are advisors in crop protection and equipment suppliers; the Directive 2009/128/EC acknowledges their key role and requires that equipment suppliers should be trained in IPM just as plant protection advisors.

There are also concerns about machines not considered pesticide application equipment, but whose operation poses risk of contamination, such as pneumatic seeders and planting machines. The pneumatic seeder's exhaust air contains concentrated chemicals – a serious hazard for bees and surface waters, so do planting machines with chemical treatment units. They are not covered by pesticide related regulations and not subject to control.

## About workshop and participants

In first year of the IPM's Directive 2009/128/EC implementation, the Discussion Workshop was held in Poznań. The Section of Plant Protection Methods and Products (Committee of Plant Protection of the Polish Academy of Sciences) initiated this workshop in cooperation with the Committee of Agricultural Engineering of the Polish Academy of Sciences) and Technical Committee (TC-16 – Tractors and machinery for agriculture and forestry) of Polish Committee for Standardization (PKN-KT-16) – CEN and ISO member. The workshop gathered over 170 participants: representatives of about 40 accredited sprayers testing stations, scientists and experts from ten research institutions. The discussion was focused on the practical problems of IPM from the point of spraying system diagnosticians, operators, and advisors in plant protection.

## Conclusions

Diagnosticians proposed their ways of improving the spraying system testing regulations. In particular, the need for using both tests (flow rate and cross distribution) on spray boom operating quality was discussed. The liberal requirement for new sprayers – first mandatory check five years after purchase – was strongly criticized.

Another issue were the techniques of spraying at higher wind speeds – the recently eased regulations allow conducting treatments up to the wind speed of 4 m/s, but have not been accompanied by precise operating guidelines on spraying techniques and working parameters yet. The problem of lack of spray distribution standards and drift reduction technology classifications was vigorously discussed. The participants called for unification of international and national requirements in this respect (CEN, PN, ISO, SPISE, ENTAM).

The participants agreed that the majority of IPM manuals ignore technical aspects. Sprayer operators and advisors in crop protection emphasized the need for precise manuals with professional, confirmed (reviewed) and reliable information on how to operate sprayers in particular conditions. In particular, they should include the guidelines for drop-size determination and spray classes unified with PPP labels.

Some owners of sprayer testing units mentioned that the price of test should be determined by governmental decision and fixed similar to system used in periodic technical inspection of cars. Leaving unregulated prices for a standard and compulsory procedure leads to unfair competition and corruption: cases of issuing certificates without a complete test were reported. Further standardisation of tests is needed – a relationship between scope and duration of sprayer tests should be established.

The diagnosticians opt for a 30-minutes procedure, including issuing the documents.

Diagnosticians and owners of workshops authorized for mandatory sprayers testing underlined the need to build some knowledge sharing platform connecting workshops, experts and advisors in plant protection. Therefore, the participants put forward that similar meetings and workshops should be repeated periodically, with the presence of representatives of regulatory bodies. The meetings would facilitate an open discussion and getting familiar with state-of-the-art in spraying systems testing equipment.

The participants agreed that – following the example of other EC countries and the requirements of the Directive 2009/128/EC – that the Polish Ministry of Agriculture and Rural Development should appoint an officer responsible for the mandatory system of sprayer testing.

## References

- Directive 2009/128/EC: DIRECTIVE 2009/128/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 October 2009, establishing a framework for Community action to achieve the sustainable use of pesticides. 16 pp.
- EN-ISO 12761-2 2002: Sprayers and liquid fertilizer distributors – Environmental protection Part 2: Field crop sprayers. 18 pp.
- ISO 10625 2005: Equipment for crop protection. Sprayer nozzles. Colour coding for identification. Int. Standard. Org. 12 pp.