

MARKET PLACEMENT OF MICROORGANISMS IN POLAND

Summary

The analysis of all products containing microorganisms registered in Poland for use in agriculture, whether as plant protection products or as fertilizers in April 2014 shows that the market share of microbial products is not high. Only 0.75% of plant protection products and 2.7% of registered fertilizers contain microorganisms.

*Nine plant protection products containing 6 different microorganisms: one virus, two strains of bacteria and three fungi were placed on the Polish market. Three of them are registered as fungicides and six as insecticides. Only two uses for agriculture crops were registered; namely protection of potato against the Colorado beetle and protection of oilseed rape against diseases caused by *Sclerotinia* Spp. There are 21 products containing microorganisms registered in Poland according to the rules regarding fertilizers: 4 registered as fertilizers, 5 as growth stimulators, 4 as surface soil, and 8 as soil conditioners.*

Key words: Poland, agriculture, microorganism, plant protection, fertilizer, IPM, integrated pest management, biopesticides

WPROWADZANIE MIKROORGANIZMÓW DO OBROTU HANDLOWEGO W POLSCE

Streszczenie

*Przeprowadzona w kwietniu 2014 analiza wszystkich produktów zawierających mikroorganizmy przeznaczonych do stosowania w rolnictwie, zarejestrowanych w Polsce jako nawozy lub jako środki ochrony roślin pokazuje, że udział w rynku tych produktów nie jest duży. Tylko 0,75% środków ochrony roślin i 2,7% zarejestrowanych nawozów zawiera mikroorganizmy. Do obrotu w Polsce było dopuszczonych dziewięć środków ochrony roślin zawierających 6 różnych mikroorganizmów: jeden szczep wirusa, dwa szczepy bakterii i trzy grzybów. Trzy z nich są zarejestrowane jako fungicydy a sześć jako insektycydy. Zarejestrowano tylko dwa zastosowania w uprawach rolniczych: ochronę ziemniaka przed stonką ziemniaczaną oraz ochronę rzepaku przed chorobami powodowanymi przez *Sclerotinia* Spp. W Polsce zarejestrowano także 21 preparatów zawierających mikroorganizmy zgodnie z przepisami o nawożeniu: 4 jako nawozy, 5 jako stymulatory wzrostu, 4 jako podłoża glebowe i 8 jako preparaty poprawiające właściwości gleby.*

Słowa kluczowe: Polska, rolnictwo, mikroorganizmy, ochrona roślin, nawożenie, IPM, integrowana ochrona roślin, biopestycydy

1. Introduction

Numerous products containing microorganisms are sold commercially for use in agriculture. While market placement of plant protection products has been strictly regulated within the EU by uniform law for many years [1, 2], the guidelines for commercial sales of other products containing microorganisms differ significantly among member states. In some countries and likewise for some groups of products there is no need for registration at all [5].

In the case of plant protection products, registration is obligatory in Poland, as in all other European Union member states. From the point of view of the farmer, registration provides a guarantee that the product is safe and efficient if properly used, as safety and efficacy assessment is an obligatory part of the registration process of each plant protection product. In the case of fertilizers, registration assures farmers that the product is suitable for the declared use and its application may be beneficial. However, it should be stressed that unregistered products containing microorganisms are also legally sold for use in agriculture in Poland. Examples include products which speed up the composting process or root nodule bacteria used in legumes.

This paper presents an analysis of registered products containing microorganisms placed on the Polish market for use in agriculture.

2. Materials and methods

The analysis includes all products containing microorganisms (including viruses) registered in Poland for use in agriculture either as plant protection products or as fertilizers in April 2014. The source for analysis of registered plant protection products containing microorganisms was the official register of the Polish Ministry of Agriculture and Rural Development [3] and the labels of the registered plant protection products.

The source for analysis of registered fertilizers was also the official register of Polish Ministry of Agriculture and Rural Development [6,7]. Since the official register of fertilizers does not contain information regarding the composition of fertilizers, the only public source available with information about fertilizer content is the website of individual producers. The following approach was taken to identify fertilizers containing microorganisms:

1. the information given on the website of a producer was verified;
2. in the case of the lack of website information (which totaled 10 products or about 1,3% of registered fertilizers), the product was not analyzed (which is to say, the products were categorized as not containing microorganisms);
3. the product was qualified to the group of fertilizers containing microorganisms on the basis of the producers' declaration;

Table 1. Microorganisms placed on the Polish market as plant protection products in April 2014

Microorganism	Group	Number of registered products	Use	Registered uses
<i>Aureobasidium pullulans</i> str. DSM 14940 and DSM 14941	fungi	1	fungicide	pome fruit (apple, pear)
<i>Bacillus thuringiensis</i> var. Kurstaki str. ABTS-351	bacteria	2	insecticide	vegetables (pea, cabbage), pine forests
<i>Bacillus thuringiensis</i> subsp. Tenebrionis str. NB 176	bacteria	1	insecticide	potato
<i>Cydia pomonella</i> Granulosis Virus (CpGV)	virus	3	insecticide	pome fruit (apple, pear)
<i>Coniothyrium minitans</i> str. CON/M/91-08	fungi	1	fungicide	vegetables, oilseed rape, ornamental plants
<i>Pythium oligandrum</i> M1	fungi	1	fungicide	vegetables, strawberry, hop, cherry, raspberry, pear, blackcurrant, blueberry, ornamental crops, tree nurseries, lawns

Source: Personal elaboration

Table 2. Registration of fertilizers in Poland in numbers (in April 2014)

Group of products	Number of registered products	Number of product containing microorganisms	Share of products containing microorganisms
Fertilizers	312	4	1,3%
Growth stimulators	21	5	23,8%
Surface soil	366	4	1,1%
Soil conditioners	89	8	9,0%
Total	788	21	2,7%

Source: Personal elaboration

4. the data quoted in this paper as regards the type of microorganisms in the fertilizer rely on the information provided by the producers.

3. Results

In April 2014 there were 1206 plant protection products in the official register of the Polish Ministry of Agriculture and Rural Development. Nine of them (or 0,75% of the total amount) contained microorganisms as an active substance. Apart from this, two insecticides containing spinosad were registered in Poland. The products with spinosad are worth mentioning, but were not included in this analysis because spinosad is a product containing the metabolites Spinosyn A and D of the soil bacterium *Saccharopolyspora spinosa* and not the microorganism itself.

Table 1 presents the microorganisms registered in Poland in plant protection products. There are only six of them: one strain of virus, two strains of bacteria and three of fungi. They were placed on the market in nine products: 3 fungicides and 6 insecticides. Six out of nine products containing microorganisms are qualified for use in organic farming in Poland [4]. Most of products with microorganisms as an active substance are registered for protection of fruits and vegetables. There are also registered uses in ornamental plants, pine forests and tree nurseries as well as lawns. Only two products containing microorganisms were registered for protection of agricultural crops: an insecticide for potato protection against the Colorado beetle and a fungicide for protection of oilseed rape against diseases caused by *Sclerotinia spp.*

The products registered according to the rules regarding fertilizers are divided initially into two groups: fertilizers and products enhancing plant cultivation, which are further divided into three groups: growth stimulators, surface soil and soil conditioners (direct translation from Polish: prod-

ucts improving soil properties). Therefore, in total there are four groups of products registered in accordance with the guidelines regarding fertilizers. For each of these groups the Ministry of Agriculture provides a separate register. For this reason, the products were analyzed separately.

Table 2 presents the number and a share of products containing microorganisms in each group of products registered in line with the guidelines for fertilizers. In total, 21 out of 788 products or 2,7% of all registered fertilizers contained microorganisms. The share of products containing microorganisms among fertilizers is therefore not high, but on the other hand about three times higher than in the group of plant protection products. The highest share of microbial products was in the smallest group of growth stimulators, while the lowest share was among the products placed on the market as surface soil.

It is not a simple task to summarize the results as regards the type of microorganisms in products registered according to the guidelines regarding fertilizers. As it was stated in "Materials and methods", the only source of publicly available information about fertilizer content is the website of a given fertilizer producer. The precision of available information as regards type of microorganisms depends therefore strictly on the producers' will and marketing strategy and varies significantly among products. Some producers declare that their product contains only "microorganisms" or "effective microorganisms", which gives only a very limited understanding of the actual content. However, the following conclusions can be arrived at:

1. All products belonging to the group of growth stimulators where the addition of microorganism has been declared come from one producer. They all contain *Rhizobium* or *Bradyrhizobium* bacteria, which fix nitrogen after becoming established inside root nodules of legumes and therefore

enhance the development of legumes and accumulation of nitrogen in soil. This can be regarded as voluntary registration, as there is a loophole concerning market placement of legume symbionts and their registration is not obligatory.

2. All products belonging to the group of surface soil where the addition of microorganism has been declared come from one producer (who is not the same producer mentioned above for growth stimulators). They all contain yeast, lactic acid bacteria and photosynthesis bacteria.

3. Four products belonging to the group of fertilizers, where the addition of microorganisms has been declared, come from four different producers. In each case declaration regarding the type of microorganism was very general.

4. Eight products belonging to the group of soil conditioners where the addition of microorganism has been declared come from six different producers. Some of them mention only 'microorganisms', which others state 'some yeast', saprophytic fungi, *Azotobacter*, *Actinobacteria* and photosynthesis bacteria.

4. Conclusions

The analysis of registered products does not give a complete picture of the availability of preparations containing microorganisms for use in Polish agriculture. The sale of plant protection products in the European Union is allowed only after their separate registration in each member state. However, due to the Free Market, all fertilizers registered in one member state of the European Union can be sold in all other member states, affording Polish farmers access to a very wide group of products. As mentioned earlier, there are also products containing microorganisms which are used in agriculture, and which do not require registration in Poland.

The analysis of products containing microorganisms placed on the Polish market by the official decision of the Polish authority leads to the following conclusions:

1. Nine plant protection products containing 6 different microorganisms: one virus, two strains of bacteria and three fungi are for sale on the Polish market. Three of them are registered as fungicides and six as insecticides.

2. The majority of registered uses of microbial plant protection products are vegetable and fruit protection. Only two uses for agriculture crops are registered: protection of potato against the Colorado beetle and protection of oilseed rape against diseases caused by *Sclerotinia Spp.*

3. There are 21 products containing microorganisms registered in Poland according to the guidelines regarding ferti-

lizers: 4 registered as fertilizers, 5 as growth stimulators, 4 as surface soil, and 8 as soil conditioners.

4. The publicly available description as regards microorganisms in fertilizers is often very general and not very informative. With some exceptions, it is therefore difficult to establish what role the addition of microorganism plays in the fertilizer.

5. Products with microorganisms as an active substance constitute 0,75% of all plant protection products registered in Poland. Products containing microorganisms constitute 2,7% of products registered according to the guidelines regarding fertilizers. The share of microorganisms placed on the Polish market in registered products is therefore not high.

5. References

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