SURVEY OF CURRENT CROP AND PEST MANAGEMENT PRACTICES ON BLACK CURRANT PLANTATIONS IN POLAND

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ABSTRACT

In order to learn about the opportunities and challenges involved in implementing integrated black currant production in Poland, a structured questionnaire was designed to assess the current state of black currant production. The questionnaire was submitted to randomly selected growers in black currant producing regions of the country. The questionnaire was designed to collect the following information: (a) general characteristics of farms and producers; (b) the extent of black currant cultivation and its frequency distribution between farms; (c) knowledge of proper management and production practices, with special attention to Good Plant Protection Practices. Pests, diseases and other factors, which reduce yield and fruit quality, were also identified.

Recent European Union laws, decrees and funding pertaining to IFP training and certification should promote ecologically friendly black currant production in Poland. This study should serve as a reference point for the future evaluation of nationwide IFP training starting in 2005.

Key words: integrated production, integrated pest management, black currant, KAP survey

INTRODUCTION

During the last twenty years, significant progress has been made in developing integrated pest, weed and disease control methods, which can be specifically recommended for use by black currant growers in Poland. First, the biology, ecology and economic significance of major pests, weeds and

pathogens were exhaustively studied to identify the particular problems faced by Polish black currant growers and develop strategies to control them (Łabanowska, 2003). For example, predatory mites (*Phytoseiidae*) were found to play an important role in controlling spider mites (*Tetranychidae*), and can be used as biological control agents (Kropczyńska and Czajkowska, 1995; Niemczyk et al., 1996). At the Research Institute of Pomology and Floriculture in Skierniewice, Poland, plant breeders, agronomists, plant pathologists and weed scientists have developed guidelines for integrated pest, weed and disease control specifically tailored to fit the needs of Polish black currant growers (Gajek et al., 1998; Niemczyk et al., 2000; Olszak et al., 2000). The first set of guidelines was released in 2002 (Niemczyk, 2002).

However, even though more Polish black currant growers are trained in Integrated Fruit Production (IFP), only a small fraction of black currant production is carried out in accordance with IFP guidelines (Jorg and Cross, 2000). The total area given over to the production of all currant varieties in Poland has averaged about 39,000 hectares, of which about 30,000 hectares are given over to black currant production (Mochecki, 2003).

The first objective of our project, which began in 2001, was to monitor and document knowledge of, attitudes toward, and practices in black currant production and protection (KAP survey). However, the incorporation of ten new countries, including Poland, into the European Union in May 2004 has added an additional perspective to our studies. The Polish Parliament passed a law in December 2003, and the Minister of Agriculture and Rural Development issued a decree in June 2003 pertaining to integrated production and certification procedures, on the basis of which the quality of Polish agriculture and horticulture products can be improved to the point where they can compete on the European market. The PHARE fund for training farmers in IFP should enable them to meet this challenge.

MATERIAL AND METHODS

A structured questionnaire was designed based on our previous experience in integrated crop and pest management projects (Dabrowski, 1997; Łabanowska et al., 2002). The following information was collected:

(a) general characteristics of farms and producers;
(b) the extent of black currant cultivation and its frequency distribution between farms;
(c) knowledge of proper management and production practices, with special attention to identifying pests, diseases and other factors which reduce yield and fruit quality;
(d) perception and evaluation of training courses on the integrated production of black currants;
(e) the need for further extension assistance, including publications on IFP recommendations, pest monitoring and diagnosis.

Between 2001 and 2003, 250 questionnaires were distributed among black currant producers located in the black currant growing regions of Poland. Only 68 questionnaires were returned fully completed. Based on these responses, the only data that could be reliably estimated are the percentages of farmers using a particular practice, cultivar, or method of pest control. Special attention was paid to whether the respondents had participated in the IFP training courses.

In this paper, only the first three items listed above will be discussed. The other items will be covered in a separate paper.

RESULTS AND DISCUSSION

General characteristics of black currant producers

The largest group of respondents come from Łódź Province (42%), followed by Mazowieckie (18%), Lubelskie (15%), Kujawsko-Pomorskie (12%) and Zachodnio-Pomorskie (9%). Men make up 79% and women 21% of currant producers. The largest age group was between 45-55 years (38.2%), followed by the 35-45 year group (29.4%) and older than 55 years (20.6%). 50% of the women and 30% of the men had higher education; 43% of the women and 53% of the men had secondary education, and 7% of both the women and the men had primary school education. The largest group of farmers (31%) have 2-5 ha under black currant production; 29% – 5-10 ha; 12% – 1-2 ha; 10% – up to 1 ha. Between 6-7% of farmers have plantations of following acreage: 2-5 ha, 10-15 ha and larger than 20 ha. 56% of the respondents reported that their farms are specialized in black currant production. Another 38% reported that they were engaged in general crop production. 6% did not answer the question. Most respondents (64%) participated in the IFP courses, and 36% did not.

Pre-planting practices

Proper field selection and soil preparation are essential for establishing a healthy and productive black currant plantation. The crop previously grown on the site is important. 68% of farmers planted black currant after cereals; 10% after fodder plants; 9% after legume crops; and 3% after root crops.

The black currant plantations established by the respondents were planted on soils varying from class II to class VI. Most plantations were characterized by more than one soil type (Fig. 1).

Black currant cultivars grown by farmers

The cultivars most commonly grown by our respondents are older cultivars such as ‘Ojebyn’ and ‘Titania’ (Tab. 1). Our respondents considered ‘Ojebyn’ to be a variety that is high yielding, resistant to frost and American gooseberry mildew, and suitable for mechanical harvesting. Our respondents also had a high opinion of ‘Titania’ because it is resistant to major diseases, which

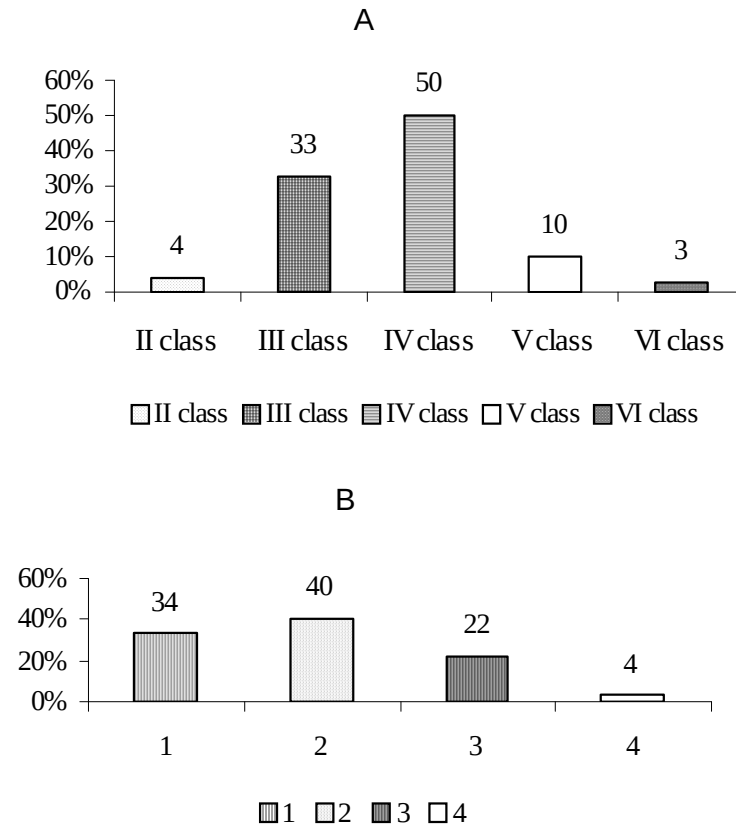

Figure 1. Class of soil under black currant plantations: A – percentage of total area declared by farmers; B – number of soil classes [in %] under black currant production in individual farm

Table 1. List of black currant cultivars and their acreage grown by surveyed farmers in 2000-2003

Cultivar	Acreage in ha	Percentage of cv. grown
Ojebyn	174.7	33.9
Titania	150.2	29.1
Ben Lomond	87.6	16.9
Ben Alder	49.4	9.6
Ben Tirran	31.3	6.1
Triton	9.8	1.9
Ben Nevis	6.5	1.3
Ben Sarek	6.2	1.2
Bona	0.4	0.1
TOTAL	516.1	100.0

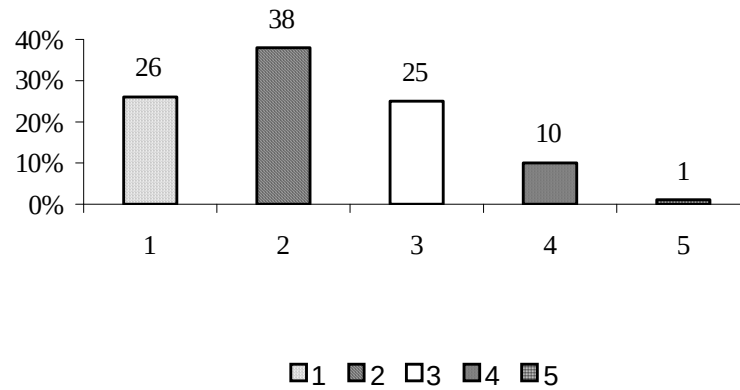

Figure 2. Number of black currant cultivars grown by individual farmers

substantially reduces costs associated with fungicide treatments. However, they were also aware of the fact that 'Titania' is not a favorite of the food processing industry. Several respondents were worried that, if 'Ojebyn' and 'Titania' were removed from the official register, they would have a difficult time selecting replacement cultivars.

Other respondents have planted newly recommended cultivars such as 'Ben Lomond', 'Ben Alder', and 'Ben Tirran', either alone or in combination with the older, familiar cultivars in order to evaluate their performance. While they appreciate the high yield potential and processing value of these newer cultivars, they are disappointed by their high susceptibility to diseases and overly vigorous vegetative growth. 'Ben Lomond' is highly susceptible to American gooseberry mildew and the black currant midge (*Resseliella ribis* Marik.), a pest which is difficult to control (Fig. 2).

Evaluation of planting material quality

50% of our respondents were satisfied that the planting material they purchased from nurseries was of high quality and free from diseases and arthropod pests. However, 30% complained that the planting material, which they had purchased, was of low quality, which led to problems with diseases and pests. A frequently reported problem was the appearance of black currant reversion virus and the black currant gall mite (*Cecidophyopsis ribis* Westw.) soon after planting.

Compliance with Good Plant Protection Practices (GPPP)

An ecological aware grower accepts and complies with GPPP

guidelines and other laws. The government, for example, requires that growers use properly inspected spraying equipment.

96% of all respondents were aware of these requirements. However, only 59% of the IFP course participants and 49% of non-participants used properly inspected spraying equipment.

There were also significant differences between these course participants and non-participants with regard to their behavior when preparing pesticide mixtures for spraying. 91% of the course participants obeyed recommended precautions, while only 78% of non-participants did. Another factor determining compliance with recommended precautions was education level. Among IFP course participants, the level of non-compliance was 2.3% for those with higher education and 6.8% for those with lower education. Among non-participants, the level of non-compliance was 4.3% for those with higher education and 13% for those with lower education.

Surprisingly, only 79% of the IFP course participants complied with recommended protection measures during spraying, while 88% of non-participants did. The most commonly protection measures were:

- protective clothing, goggles, rubber gloves, rubber boots and face-masks;
- designated buckets, bowls and other equipment;
- maintaining spraying equipment in accordance with standards.

To avoid accidental herbicide damage during spraying, separate spraying equipment should be designated for fungicides and insecticides, which should never be used for herbicides. Unfortunately, only 59% of course participants and 54% of non-participants complied with this rule, which is not a significant difference.

Choice of pesticide indirectly reflects the farmer's attitude to environmental issues. 67% of the farmers considered efficacy of the pesticide as the first priority; 25% price; and 6% environment safety (Tab. 2).

Table 2. Rank of farmer's priorities [in %] in choosing a pesticide for plant protection treatment on black currant plantation

A priority	1st choice	2nd choice	3rd choice
Price	25.0	44.1	23.5
Efficacy	60.3	17.6	14.7
Environmental input	5.9	29.4	55.9

The farmers were asked to describe the place where they store their pesticides. 36% of the IFP-farmers and 42% of the non-participants keep their chemicals in separate rooms, not describing it precisely. 32% of the IFP growers and only 8% of the non-participants had a special room for pesticide storage. 11% of the IFP-farmers and 8% of the others buy pesticide for immediate use, eliminating the need to store the unused portion.

Sources of information for plant protection decisions

Our respondents selected pesticides based on various sources of information. Most referred to the official recommendations of the Plant Protection Program developed at the Research Institute of Pomology and Floriculture or relied on their own knowledge and experience and knowledge. Only a few relied on the advice of agricultural extension agents, which reflects a lack of specialized expertise in horticulture production on the part of most agents.

The responses of black currant growers indicated that they took decisions on selecting pesticides for treatments based on various sources of information. Most farmers relied on to the official recommendations prepared by the staff of Research Institute of Pomology and Floriculture (and published in a separate volume by independent publishers). The rest of the data for other sources of information is shown in Figure 3. Low indications for Agricultural Extension Service confirm a lack of specialized expertise in horticulture production by most extension staff at present.

Monitoring for pests

Regular monitoring of crop plants is an important indicator of farmer's acceptance of Integrated Pest Management (IPM) principles. Surprisingly, 92.6% of growers reported that they frequently inspect their plantations. There were no significant differences between the IFP course participants and the other farmers. Just over 70% farmers claimed losses caused by diseases and arthropod pests between 5-30%. The detailed data is shown in Table 3.

Table 3. Perception of black currant losses caused by diseases and arthropod pests by surveyed farmers

Declared yield losses	Number of farmers	Percentage of farmers
0 – 5%	7	10.3
5 – 10%	18	26.5
10 – 15%	5	7.3
15 – 20%	8	11.8
20 – 25%	4	5.9
25 – 30%	13	19.1
> 30%	3	4.4
Not specified	7	10.3
No answer	3	4.4
TOTAL	68	100.0

One reasons for high yield losses is improper identification and diagnosis of pests and diseases. 38% of our respondents reported that they had this problem. IFP course participants reported having had this problem more than non-participants, which probably reflects their greater awareness of the wide range of factors that can cause yield loss. On the other hand, less educated growers also reported having this problem more than better educated growers, probably because they did not have sufficient knowledge of all of factors, which can affect black currant health and therefore could not accurately identify symptoms, which might indicate potential yield loss.

Even though our respondents often had trouble diagnosing pest and disease symptoms, 80% were fully satisfied with the efficacy of the pesticides they

chose. 7% were partially satisfied and 10% were dissatisfied.

Recognition of factors affecting high quality production

54% of our respondents are aware of the factors affecting yield quality, whereas 40% are not. 6.0% of farmers did not answer the question. The factors most often reported in order of frequency were:

- pests and diseases;
- not being able to use chemical protection against pests and diseases because of the high costs;
- not being able to use high quality, high technology spraying equipment because of the high costs;
- lack of cultivars resistant to common pests and diseases;
- not being able to plant newer, high quality cultivars because of the high costs;
- shortage of skilled labor;
- drought during the growing season and insufficient water resources for irrigation;
- insufficient price differences between high quality and low quality fruit;
- lack of time to devote to the plantation because of a second job;
- inefficient monitoring because the plantation is too far from the grower's residence;
- poor soil quality.

CONCLUSIONS

1. 65% of the growers who participated in an IFP course are fully prepared to manage and protect their black currant plantations in accordance with IFP guidelines.
2. 54% of respondents reported having had problems with producing high quality product. This means that researchers and extension agents have to further improve their knowledge and services;
3. Unpredictable profits from black-currant production limit investment in modern spraying and harvesting machinery and newer, high quality cultivars.
4. Further improvement is needed in monitoring for pests and diseases, attestation of spraying equipment, pesticide storage, and use of protective clothing while mixing and spraying pesticides. Recent European Union laws, decrees and funding pertaining to IFP training and certification should promote ecologically friendly black currant production in Poland.
5. This study should serve as a reference point for the future evaluation of nationwide IFP training starting in 2005.

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STOSOWANE PRAKTYKI PRODUKCYJNE I OCHRONY ROŚLIN NA PLANTACJACH PORZECZKI CZARNEJ W POLSCE

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S T R E S Z C Z E N I E

Na podstawie badań ankietowych wśród producentów porzeczki czarnej, którzy ukończyli kurs Integrowanej Produkcji (IP) oraz tych, którzy nie uczęszczali na kurs, dokonano oceny stosowanych praktyk produkcyjnych, takich jak wyboru stanowiska pod nową plantację; stosowanego przedplonu oraz wyboru i oceny odmiany. Przy analizie praktyk związanych z ochroną roślin uwzględniono czynniki, takie jak percepcję producentów odnośnie strat w plonie powodowanych przez agrofagi; priorytety w wyborze preparatu do zabiegów chemicznego zwalczania i przestrzegania Dobrych Praktyk Ochrony Roślin. Podano czynniki, które zdaniem producentów uniemożliwiają im uzyskanie plonu wysokiej jakości. Zarówno podana w pracy metodyka, jak i dane liczbowe powinny w przyszłości być wykorzystane do oceny skuteczności wdrażania IP na plantacjach czarnej porzeczki, w wyniku masowego szkolenia producentów owoców w produkcji integrowanej (IP) i wprowadzenia wymagań uzyskania certyfikatów IP przy obrocie hurtowym i dla przetwórstwa.

Słowa kluczowe: integrowana produkcja, praktyki produkcyjne, czarna porzeczka, badania ankietowe