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Phytosanitary conditions of the organic field and boundary

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Abstract. In the field and boundary of certificated field for organic farming in the Institute of Agriculture – Karnobat have been observed and described diseases, pests and weeds in wild and cultivated plants and dependencies between them are reported. The cultural plant diversity at the certified field for organic farming is significant and amounts to 32 species and varieties of cereals. The weeds in crops and in the free areas significantly differed. In crops, the annual broadleaf weeds had greater diversity of species (*Anthemis arvensis* L., *Lathyrus aphaca* L., *Papaver phoeas* L., *Polygonum aviculare* L., *Polygonum convolvulus* L.) and at the boundaries – the cereal weeds (*Apera spica-venti* L., *Hordeum murinum* L., *Bromus tectorum* L., *Poa pratensis* L.). At the adjacent areas the perennial broadleaf weeds – *Cirsium arvense* (L.) Scop. and *Convolvulus arvensis* L. were not found. At the boundaries less pest species and types of diseases were registered than in the crop fields. In cereals the most common pests are *Sitobion avenae* L., *Aelia acuminata* L., *Eurygaster austriaca* Schr. Beneficial insects are *Coccinella septempunctata* L. The most common diseases are *Erysiphe graminis* and *Rhynchosporium secalis* (Oudem.) Davis.

Keywords: phytosanitary conditions, organical farming, cereals, boundary, diseases, pests, weeds

Introduction

Maintaining greater biodiversity in organic farms is an important priority in implementing their sustainable development (Yancheva et al., 2012). In conventional farms, the number of crops grown is about 5 – 6, whereas in organic 20 – 30 and more. The limited number of crops imposes the use of plenty of pesticides, which kill both the harmful and the useful insects. Organic farming needs a belt of natural vegetation to create natural habitats for birds, and beneficial entomofauna, which regulate the pests in the fields. Kaytazov et al. (1982) and Harizanov et al. (1996) recommend increasing the part of specific and polyphagous predators and parasites in the cereal crops, growing annual and perennial grasses, nectar-bearing plants, shrubs next to them. These crops create conditions for additional nutrition and hosts where the entomophaga can multiply. Under the conditions of organic farming the weeds with relatively low density can play a positive role in the form of provided nutrition (habitat) for the beneficial organisms found at the argobiocenosis (Patriquinetal, 1988; Clemensetal, 1994). Atanasova et al. (2012) reported that the survey of the field boundaries found that the weed species composition differed over the years.

Some negative sides of the boundaries of natural vegetation were also pointed out (Andreev, 2003). The perennial cereal species of *Bromus inermis* L., *Dactylis glomerata* L., *Elitrigia repens* L., *Festuca elatior* L., *Lolium perenne* L., *Phleum pratense* L., *Poa pratensis* L. and *Sorghum halepensis* (L.) Pers are hosts for the barley yellow dwarf virus (BYDV) (Kovachevski et al., 1999). In the region of South-eastern Bulgaria were mainly found four species of pests on the cereal crops and at field boundaries: *Sitobion avenae*, *Schizaphis graminum*, *Rhopalosiphum maidis* and *Rhopalosiphum padi* (Maneva, 2007; Maneva, 2010; Maneva et al., 2009). Surveys on field boundaries reported the preferences of aphids to certain weeds (Atanasova et al., 2012).

Some weeds stand as hosts for a number of rare diseases on

cereal crops (Hristov, 1959). At the boundaries near Karnobat were found loose smut *Ustilago nuda* on wall barley *Hordeum murinum*., on wild oats *Avena spp* – crown rust *Puccinia coronata* (Atanasova et al., 2012).

The aim of this study was to conduct phytosanitary monitoring to establish and compare the species of weeds, pests and diseases in the organic farming fields and field boundaries in the area of South-eastern Bulgaria.

Materials and methods

The surveys were carried out at the fields and field boundaries of the certified field for organic farming (74 da) at the Institute of Agriculture in Karnobat, Bulgaria, over the period of 2012 – 2015. In the grown different species and varieties of cereals. The weeds were determined according to Delipavlov et al. (2003). All the species found in fields and boundaries are registered. To establish the species composition and trace the dynamics of the population density of the pests standard entomologic methods were used – direct reporting on individual plants. The taxonomic analysis of aphids was performed according to Emden (1972) and Blackman and Eastop (1984). The species composition of the phytopathogens on the crop and weed vegetation were determined through standard methods.

Results and discussion

Plant diversity in the certified organic field was significant. The winter cereals, which are the main subject of trials, numbered 32 species and varieties (Table 1). No significant variation of diseases, pests and weeds by years of study. The weed plants we observed in

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the crops and the free areas differed significantly. In the crops, the annual broadleaf weeds had greater species diversity. Weeds such as grass pea, common gromwell, black bindweed, corn buttercup, field mustard, heartsease and ivy-leaved speedwell are very often found in the crops and are not found in the adjacent areas (Table 2). At the adjacent areas the perennial broadleaf weeds - creeping thistle and field bindweed were not found either.

The cereal crops occupied a significant share of the weed plants at the boundaries. As percentage of covered area at places they reached up to 90–100%. In the crops 6 different species were found, whereas in the adjacent areas – almost twice as much – 13 species.

In the spring of 2015 were determined certain cereal weeds, which occupy the areas adjacent to organic farming (boundaries) (Figure 1).

Poa pratensis L. – common meadowgrass

Poa sylvicola Guss. – rough meadowgrass

Dasypyrum villosum (L.) P. Candargy – mosquitograss, the former Latin name of this plant was *Haynaldia villosa*, but it is no longer valid.

Arrhenatherum elatius (L.) P. Beauv. ex J.Presl&C.Presl – false oat-grass

Lolium perenne L. – English ryegrass

Bromus tectorum L. – drooping brome

During the vegetation seasons, in the cereal crops were found 22 pest species. In the boundaries we only found 18 species. In the fields and the adjacent areas, the beneficial insects were 10 species (Table 3).

During the investigation conducted on weed diseases were registered: loose smut (*Ustilago nuda*) on wall barley *Hordeum murinum*., and on wild oats *Avena spp* – crown rust *Puccinia*

coronata. In the cereal crops were found – *Erysiphe graminis*, *Puccinia recondita* Dietel & Holw., *Ustilago tritici* (Pers.), *Septoria*

Table 2. Weed species

Species	Organic field	Boundary
Annual broadleaf		
<i>Agrostemma githago</i> L.-	+	+
<i>Anagalis arvensis</i> L.	+	
<i>Anthemis arvensis</i> L.	+	+
<i>Bupleurum rotundifolium</i> L.		+
<i>Cerastium anomalum</i> W.K.		+
<i>Caucalis daucooides</i> L.	+	+
<i>Centaurea cyanus</i> L.	+	+
<i>Consolida regalis</i> L.	+	+
<i>Galium aparine</i> L.	+	
<i>Lathyrus aphaca</i> L.	+	
<i>Lithospermum arvense</i> L.	+	
<i>Myosotis stricta</i> L.	+	+
<i>Orlaya grandiflora</i> L.		+
<i>Papaver phoeas</i> L.	+	+
<i>Polygonum aviculare</i> L.	+	
<i>Polygonum convolvulus</i> L.	+	
<i>Ranunculus arvensis</i> L.	+	
<i>Sinapis arvensis</i> L.	+	
<i>Torilis arvensis</i> L.		+
<i>Tragopogon pratensis</i> L.		+
<i>Sinapis arvensis</i> L.	+	+
<i>Vicia irsute</i> (L.) S.F.Gray	+	+
<i>Vicia striata</i> M.B.	+	+
<i>Veronica hederifolia</i> L.	+	
<i>Viola tricolor</i> L.	+	
Total	19	15
Perennial broadleaf		
<i>Cirsium arvense</i> (L.) Scop.	+	
<i>Convolvulus arvensis</i> L.	+	
Total	2	0
Cereal weeds		
<i>Alopecurus myosuroides</i> Huds.	+	
<i>Apera spica-venti</i> L.	+	+
<i>Arrhenatherum avenaceum</i> P.B., P. Beauv. ex J.Presl & C.Presl		+
<i>Arrhenatherum elatius</i> (L.) P. Beauv. ex J.Presl & C.Presl		+
<i>Avena</i> spp.	+	+
<i>Bromus arvensis</i> L.	+	+
<i>Bromus tectorum</i> L.		+
<i>Dasypyrum villosum</i> (L.) P. Candargy		+
<i>Eragrostis minor</i> L.		+
<i>Hordeum murinum</i> L.	+	+
<i>Lolium temulentum</i> L.	+	+
<i>Lolium perenne</i> L.		+
<i>Poa annua</i> L.		+
<i>Poa pratensis</i> L.		+
Total	6	13

Table 1. Cereal crops

Winter malting barley	Wheat
1. Obzor	21. Miryana
2. Emon	22. Enola
3. Orfey	Durum wheat
4. Lardeya	23. Progress
5. Asparuh	24. Predel
6. Kuber	Rye
7. Sayra	25. Bul Millenium
8. Imeon	26. Population
9. Zagorets	Triticale
10. Deviniya	27. Respect
11. Sitara	Winter oat
12. Perun	28. Kehlibar
13. Krami	29. Kaloyan
14. Potok	30. Eincorn
15. Vicky	(<i>Triticum monococcum</i> – 2 n)
Winter malting barley	Wheat
16. Veslets	31. Emmer
17. Aheloy 2	(<i>Triticum dicoccum</i> – 4n)
18. Tamaris	32. Kamut
19. Boznin	(<i>Triticum turgidum polonicum</i>)
20. IZ Bori	



Figure 1. Cereal weeds in boundary

Table 3. Species composition of insects

Insect species	Organic field	Boundary
Vermin		
<i>Sitobion avenae</i> L.	+	+
<i>Schizaphis graminum</i> Rond	+	+
<i>Rhopalosiphum maidis</i> (Fitch)	+	+
<i>Rhopalosiphum padi</i> (L.)	+	+
<i>Eurygaster integriceps</i> Put.	+	+
<i>Eurygaster austriaca</i> Schr.	+	+
<i>Eurygaster maura</i> L.	+	+
<i>Aelia acuminata</i> L.	+	+
<i>Aelia rostrata</i> Boh	+	+
<i>Dolycoris baccarum</i> (L.)	+	+
<i>Oulema melanopus</i> L.	+	+
<i>Oulema lichenis</i> Voet.	+	+
<i>Zabrus tenebrioides</i> Goeze	+	+
<i>Mayetiola destructor</i> Say	+	-
<i>Opomyza florum</i> Fabr	+	-
<i>Phorbia securis</i> Tien	+	-
<i>Oscinella frit</i> (L.)	+	-

<i>Psammotettix provincialis</i> (Rib)	+	+
<i>Psammotettix sriatus</i> (L.)	+	+
<i>Macrosteles laevis</i> (Rib.)	+	+
<i>Haplothrips tritici</i> Kurd.	+	+
<i>Stenothrips graminum</i> Uzel	+	+
Total	22	18
Helpful insect		
<i>Coccinella septempunctata</i> L.	+	+
<i>Coccinella quatuordecimpustulata</i> L.	+	+
<i>Cantharis fusca</i> L.	+	+
<i>Chrysopa</i> sp.	+	+
<i>Sphaerophoria scripta</i> (L.)	+	+
<i>Aphidius</i> sp.	+	+
<i>Aphidius equiseticola</i> Stary	+	+
<i>Aphidius ervi</i> Haliday	+	+
<i>Praon</i> sp.	+	+
<i>Systole</i> sp.	+	+
Total	10	10

Table 4. Diseases in cereals and boundary

Diseases	Organic field	Boundary
<i>Erysiphe graminis</i>	+	
<i>Puccinia recondita</i> Dietel & Holw.	+	
<i>Puccinia coronata</i> Corda.		+
<i>Ustilago tritici</i> (Pers.)	+	
<i>Ustilago nuda</i> Jens.		+
<i>Septoria tritici</i> Desm.	+	
<i>Rhynchosporium secalis</i> (Oudem.) Davis	+	
<i>Pyrenophora</i> sp.	+	

tritici Desm., *Rhynchosporium secalis* (Oudem.) Davis, *Pyrenophora* sp.

Conclusions

The cultural plant diversity in the certified field for organic farming is significant and amounts to 32 species and varieties. The weeds in crops and in the free areas significantly differed. In crops, the annual broadleaf weeds had greater diversity of species (*Anthemis arvensis* L., *Lathyrus aphaca* L., *Papaver phoeas* L., *Polygonum aviculare* L., *Polygonum convolvulus* L.) and at the boundaries – the cereal weeds (*Apera spica-venti* L., *Hordeum murinum* L., *Bromus tectorum* L., *Poa pratensis* L.). At the adjacent areas the perennial broadleaf weeds - *Cirsium arvense* (L.) Scop. and *Convolvulus arvensis* L. were not found. At the boundaries less pest species and types of diseases were registered than in the crop fields. In cereals the most common enemies are *Sitobion avenae* L., *Aelia acuminata* L., *Eurygaster austriaca* Schr. Beneficial insects pest *Coccinella septempunctata* L. The most common diseases are *Erysiphe graminis* and *Rhynchosporium secalis* (Oudem.) Davis.

References

Andreev R, 2003. Agricultural Entomology. Agricultural University Plovdiv (Bg).

Atanasova D, Maneva V and Popova T, 2012. Phytosanitary monitoring of the boundary of certificated field for organic farming. Scientific works of the Institute of Agriculture Karnobat. 1, 159-166 ISSN 1314-961X.

Blackman R and Eastop V, 1984. Aphids on the world's crop: an identification and information guide. New York, John Wiley and Sons.

Clements RO, Donaldson G, Purvis G and Burke J, 1994. Clover: cereal bi-cropping. Aspects of Applied Biology 50, Optimizing cereal inputs: Its scientific basis, 249-254.

Delipavlov D, Cheshmedziev I, Popova M, Terzijski D and Kovachev I, 2003. Qualifier plant in Bulgaria. Plovdiv, Academic Publishing Agricultural University (Bg).

Emden HF, 1972. Aphid technology, London and New York, 107-110.

Harizanov A, Babrikov T and Harizanova V, 1996. Biological control against pests of crops, Agropres, Sofia, 302 (Bg).

Hristov A, 1959. Special Phytopathology. Diseases of cultivated plants in Bulgaria. Zemizdat, Sofia (Bg).

Kaytazov A, Tsankov G, Videnova E and Natskova V, 1982. Handbook on biological control of pests of plants. Zemizdat, Sofia, 215 (Bg).

Kovachevski I, Markov M, Yankulova M, Trifonov D, Stoyanov D and Kacharmazov V, 1999. Virus and virus similar diseases of crop plants. PublishSaySet - Agri, Sofia, 143-145.

Maneva V, 2007. Varietal preferences of aphids in winter wheat and their impact on the mass of grain. "Plant genefund - the basis of modern agriculture." Conference - 30 years IPGR, Sadovo, 2-3, 523-525. ISBN 978-954-517-084-3.

Maneva V, 2010. Aphids (Aphididae: Hemiptera) on barley and opportunities to combat them. Thesis for PhD, Agricultural University, Plovdiv (Bg).

Patriquin DG, Bains D, Lewis J and Macdougall A, 1988. Weeds control in organic farming system. In: Weed Control in Agroecosystems: Ecological Approaches. Eds MA Altieri and M Liebman. CRS Press. 303-317.

Yancheva H, Manolov I, Atshin N, Kovach A, Daza H, Dizdar A, Zaharulis N, Litsoy V and Enamoraldio A, 2012. Handbook of Organic Farming. Publishing house VAP, ISBN: 978-954-8326-60-5 (Bg).

Review

- Honey bees and their products as indicators of environmental pollution: A review** 175
D. Salkova, M. Panayotova-Pencheva

Genetics and Breeding

- Characterization of the Bulgarian sunflower hybrid Valin** 183
G. Georgiev
- Evaluation of the combining ability of mutant maize lines** 189
V. Valkova, N. Petrovska
- Evaluation of small size fruit peppers *Capsicum annum* spp. *microcarpum* with cluster and factor analysis** 193
V. Kuneva, M. Nikolova
- Sensitivity of promising cherry hybrids and new cultivars to economically important fungal diseases** 197
K. Vasileva, S. Malchev, A. Zhivondov

Nutrition and Physiology

- Lysozyme levels in haemolymph of worker bees (*Apis mellifera* L.) from bee colonies with different degree of expression of hygienic behaviour** 201
S. Lazarov, I. Zhelyazkova, D. Salkova, R. Shumkova, S. Takova

Production Systems

- Study on energy flows of renewable sources for producing hot water on dairy farms** 205
R. Georgiev, K. Peychev, D. Georgiev, R. Slavov, S. Apostolov, J. Ellingsen, J. Tønnesen
- Loose smut of barley grown in three types of farming** 209
T. Nedelcheva, V. Maneva
- Efficacy and timing of some new products against pear psylla (*Cacopsylla pyri* L.) (Hemiptera: Psyllidae): I. Spirotetramat** 213
V. Arnaudov
- Influence of year's characteristics and the different fertilization levels on the structural elements of wheat yield** 217
V. Kuneva, R. Bazitov, A. Stoyanova

Grain combines productivity according to various unloading methods – in the field and at the edge of the field	221
N. Delchev, K. Trendafilov, G. Tihanov, Y. Stoyanov	
 Agriculture and Environment	
Effect of some herbicides on weeds and vines in mother plantation of Cabernet sauvignon	227
N. Prodanova – Marinova	
Influence of foliar herbicides treatment on malting barley (<i>Hordeum vulgare</i> L.) productivity of Emon, Vanessa and Vicky varieties	232
D. Atanasova, V. Maneva	
Selectivity and stability of herbicides and herbicide combinations for the grain yield of maize (<i>Zea Mays</i> L.)	237
G. Delchev, T. Barakova	
Effect of some soil herbicides on vegetative habits of almond trees of 'Nonpareil' cultivar grown in a second-year nursery field	242
Z. Rankova, M. Tityanov	
Phytosanitary conditions of the organic field and boundary	245
D. Atanasova, V. Maneva, N. Grozeva	
 Product Quality and Safety	
Quality traits of eggs from autosexing Easter eggers	249
H. Lukanov, A. Genchev, A. Pavlov, I. Penchev	
Amino acid composition of lamb meat from the North East Bulgarian fine fleece breed and its crossbreds from internal breeding	256
R. Slavov, G. Mihaylova, St. Ribarski, D. Panayotov, D. Pamukova, D. Dragnev	
Some results of evaluation of new-introduced apricot cultivars under conditions of Plovdiv region	262
V. Bozhkova, M. Nesheva	

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Book chapter or conference proceedings:

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Mauff G, Pulverer G, Operkuch W, Hummel K and Hidden C, 1995. C3-variants and diverse phenotypes of unconverted and converted C3. In: Provides of the Biological Fluids (ed. H. Peters), vol. 22, 143-165, Pergamon Press. Oxford, UK.

Todorov N and Mitev J, 1995. Effect of level of feeding during dry period, and body condition score on reproductive performance in dairy cows. IXth International Conference on Production Diseases in Farm Animals, September 11-14, Berlin, Germany.

Thesis:

Hristova D, 2013. Investigation on genetic diversity in local sheep breeds using DNA markers. Thesis for PhD, Trakia University, Stara Zagora, Bulgaria, (Bg).

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Animal welfare

Studies performed on experimental animals should be carried out according to internationally recognized guidelines for animal welfare. That should be clearly described in the respective section "Material and methods".

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