Scanning report
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Country: Romania

NUTS 3 region(s)[1]: NUTS 3 REGION(s): RO111 Bihor, RO112 Bistrița-Năsăud, RO113 Cluj, RO114 Maramureș, RO115 Satu Mare, RO116 Sălaj, RO121 Alba, RO122 Brașov, RO123 Covasna, RO124 Harghita, RO125 Mureș, RO126 Sibiu, RO211 Bacău, RO212 Botoșani, RO213 Iași, RO214 Neamț, RO215 Suceava, RO216 Vaslui, RO221 Brăila, RO222 Buzău, RO223 Constanța, RO224 Galați, RO225 Tulcea, RO226 Vrancea, RO311 Argeș, RO312 Călărași, RO313 Dâmbovița, RO314 Giurgiu, RO315 Ialomița, RO316 Prahova, RO317 Telorman, RO321 București, RO322 Ilfov, RO411 Dolj, RO412 Gorj, RO413 Mehedinți, RO414 Olt, RO415 Vâlcea, RO421 Arad, RO422 Caraș-Severin, RO423 Hunedoara, RO424 Timiș

WP no. and title: WP5 Sustainable fruit production

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Source materials and methodology

In Romania, the organic agriculture has a special growth in the last years, the operators registered in the system evolved from 2000 in 2008 to nearly 14.470 operators in 2014. The area cultivated organically increased from 182.706 ha in 2010 to 289.252 ha in 2014 (http://ec.europa.eu/eurostat/data/database). Orchards and vineyard represent 3,25% from the total surface in organic crop (http://www.madr.ro/ro/agricultura-ecologica.html). For orchards, approximately 86% are under conversion and only 14% are certified (FAO Statistics; PNDR 2014).

One of the three priorities of the National Strategy for the Development of the Food sector in the medium and long horizon 2020-2030 consist in growing the organic production, from 3% in the present to 10% in 2020 respectively 15% in 2030 (http://www.madr.ro/strategia-pentru-dezvoltarea-sectorului-agroalimentar-pe-termen-mediu-si-lung-orizont-2020-2030.html).

There are special subventions from the national budget and from PNDR 2014 – 2020, the organic agriculture is stimulated through selection criteria and also by increasing the value of the non-refundable amount with 20%.

The new Sub Program for Fruit Growing financed through the Rural Development Program PNDR 2014-2020 create new opportunities for the organic orchards and put some pression in the same time on the conventional fruit production.

Different research projects were conducted in particular in testing the resistant varieties, optimum products and concentration used as organic pesticides, methods to increase the soil fertility etc.

[1] Please see ec.europa.eu/eurostat/ramon/nomenclatures/ for details on NUTS regions, level 3

Best practice findings

1. Apple scab resistance varieties behaviour in an organic orchard

Researches made in orchards with disease vulnerable varieties (Jonathan, Golden delicious) showed that the average number of treatments was 15-20, while for the resistant varieties was 7. Savings made in the orchard with resistant varieties by removing up to 90% of fungicides, and a reduction of 81% of insecticides and acaricides, represents 66% compared to those with vulnerable varieties (Popescu, communication - Research and Development Station for Fruit Growing Voinesti, Romania).

In an experimental organic apple orchard, three scab resistant varieties (Rubinola, Topas and Gold Rush), grafted on M9 rootstock, are studied since 2008, at the Faculty of Horticulture, USAMV Bucuresti.

The inter row was cultivated with a mixture of perennial grasses and mowed mechanically. Drip irrigation was provided on the row, having a continuous line with auto compensating drippers every 0.5 m. On the row, the soil was maintained clean by hand and mechanical cultivation. The fertilization was assured with different types of Fertisol and Folplant, organo-mineral fertilizers, applied to the soil and foliar sprays, respectively. An integrated pest management was applied by using pheromones traps, mat disruption and organic approved, non-chemical pesticides. Tree growth was measured using annual trunk cross sectional area, number and shoots length per tree, typology of the fruit branches, etc. In parallel, blooming intensity, fruit set percentage, fruit number, fruit size and fruit production per tree were measured and evaluated.

The evolution of the soil agrochemical characteristics and plant content in nutrients was studied along the year, based on monthly analyses. The results entirely justify the use of organo-mineral fertilizers to insure a high fruit yield and the economic efficiency and sustainability of the organic apple orchard (Stănică et al., 2010, Ilie and Stănică, 2011, Ilie and Stănică, 2012).

2. Ameliorative plants in soil preparation for planting an organic crop

The soil ameliorating quality of different plants is highlighted by specific changes in the soil microbiology (a large number of species with antagonistic properties both from the bacteria and *Actinomycetes*, that indicates a good capacity of soil to adjust the number of species with pathogenic potential for plants; they provided good premises in a good recycling of organic vegetal materials with the help of representatives of fungi genera recognized for their ability to degrade cellulose (*Myrothecium*, *Epicoccum*, *Cladosporium*, *Stachybotrys*, *Actinomucor*, *Trichoderma*).

There were notable changes in the agrochemical soil parameters: increasing in soil humus content or mobile potassium content that increased significantly in the horizon 0-20 cm. (*USAMV Bucharest research on organic edible rose crop,* Butcaru A.C. et al. 2015).

3. Pheromone, light and color traps

Almost all fruit tree growers use pheromone traps for monitoring and risk assessment of pests (ex. atraPOM for *Cydia pomonella*, codling moth). So, the threshold is established and the decision to apply treatments is made, with more effective organic pesticide application.

The Însurăței, Comly Farm from Brăila county controls almost 100% of the pests at the apple, plum, peach and apricot species by using pheromone traps and mating disruption systems.

At USAMV București a study regarding the efficiency of LED multispectrum light to attract pests is in course. In the same, the effectiveness of coloured traps in an rose and apple

organic orchard is in study.

4. **Protect and monitoring the useful orchard fauna**

Many useful species like *Parus spp., Hirundo rustica, Passer domesticus, etc* are studied in the organic orchard ecosystem

Special bird nests and feeders are mounted in the orchards for attracting and maintain the useful fauna (Ionescu et al. 2011, Mihai et al., 2015). Monitoring of orchard bird population and other useful organisms is made constantly.

5. **Alternative organic pesticide**

Reduced risk alternatives, such as "green products" were identified as potential tools in diseases management, with the goal to obtain organic fruits.

For example, researches regarding the use of potassium bicarbonate or potassium bicarbonate mixed with potassium silicate as an alternative to classical fungicides (based on copper and sulphur) to control scab and powdery mildew in apple were made. The results obtained highlight the effectiveness of potassium bicarbonate in apple scab control in conditions of Cluj-Napoca, Romania (Mitre, 2009; Mitre 2010).

Sodium bicarbonate and cow milk is largely used and tested against powdery mildew in edible roses, gooseberry, apple, apricot, plum (*USAMV Bucharest*).

6. **Weed control**

a. Mechanical weed control is an alternative to the use of herbicides. It is used in many orchards and can give a total substitution of treatments. Test regarding the use of biorotors on the tree rank are in course

b. The use of flame (MAITO system) on controlling the weeds on the row is in test at USAMV București (unpublished data).

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