

NEW VINE AND FRUIT PLANTATIONS IN THE SOUTHEASTERN PART OF HUNGARY AS A WAY FOR RURAL DEVELOPMENT

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Abstract: Farmers in the European Union's are supported with direct payments. To qualify for the subsidies, farmers are required to perform a certain set of agricultural activity and keep many standards on food safety, environmental protection, and maintaining the land in good agricultural and environmental condition respected.

Resent technologies are focusing on making environmentally friendly growing technologies and equipments, and the efficient management of the natural resources. Plantation and re-plantation take great interest in this area. Our results suggest that in our region the dominant plantations were vineyards in the examination period. Taking soil test results into consideration are necessary for the farmers, and the results of the tests serve as a base for the soil protection plans, which are made by the experts of soil protection. The use of waters from different origin is also essential.

Key words: *plantation, vineyard, orchard, rural development, soil physical tests*

INTRODUCTION

Rural Development is the 2nd pillar of the Common Agricultural Policy (CAP) of the European Union. Rural development programmes are aiming at farm modernisation, competitiveness building, innovation, market orientation and promotion of entrepreneurship. The EU's rural development policy helps the rural areas of the EU to meet the wide range of economic, environmental and social challenges. These programmes are co-financed by the European Union and Member States and are implemented in seven year cycles. There are numerous measures proposed within rural development legislation which can be implemented by the Member States in order to support and stimulate the development of the organic sectors. The measures range from support for applying organic farming practices and methods to providing aid for marketing and promotion.

The new legislative framework for the programming period 2014 – 2020 is further stress the importance of organic farming and increases its visibility in rural development through creating a separate "Organic farming" measure, entitled for rural development funding. The EU actively supports the fruit and vegetable sector, a more competitive and market-oriented sector, greater consumption of fruit and vegetables increased use of eco-friendly cultivation and production techniques.

Rural Development Programme (RDP) for Hungary is putting emphasis on actions related to restoring, preserving and enhancing ecosystems and economic development in rural areas and promoting food chain organisations and risk management in agriculture. Almost 538 000 ha agricultural land is expected to come under management contracts supporting biodiversity, better water management and soil management. Hungary is a rural country with 66.3% of its area classified as rural. Hungarian agricultural sector is atypical with very high share of arable farming (81% of agricultural land) and low grassland (14.2%). Hungary's geographic and natural features provide excellent opportunities for quality fruit growing and trade. The southern part of the Great Hungarian Plain is the largest horticultural area of the country. The fruit-growing sector has a more productive production capacity than the other agricultural sectors, and has a more favourable occupational and supporting capacity due to the demand for high-volume harvesting and product preparation. Nowadays we have to increase the competitiveness of fruit growing in the horticultural sector, our tasks include the modernization of irrigation, enhancing the

competitiveness of fruit growing in the horticultural sector, and increasing adding value through supporting the spread of new, innovative and environmentally friendly cultivation technologies. Concerning climate change, in Hungary frequent water imbalances occur, characterized drought and floods [2]. Serious losses of crop occur in cultivation due to the drought regularly [1]. So there is a clear need for more efficient water management. Only about 2.4% of the agricultural area is irrigated, in this way Hungary has a limited and outdated irrigation system. At supporting the irrigation development investments, water use occurring from water reserves retained in water surplus periods as well as the application of water-saving processes of modern technology should be preferred, mainly in the case of garden and orchard cultures providing high profit. Groundwater use for irrigation is increasing. In the loose soils, especially in the Danube-Tisza interfluvium, the use of drilled wells for domestic and agricultural activities is widespread. Water Framework Directive requires the member states of the European Union to improve the quality of surface and ground water into good status, and sustain their good condition. Surface, subsurface and deep waters – used as irrigation water – can contribute to the nutrient supply as well [4].

Planting and modernization of plantations is supported in Hungary, which means installation of new plantations and renovation, modernization of existing plantations with the possibility of irrigation, change of variety and change of cultivation. Annual precipitation is low, and moreover, its extreme distribution would result in the reduction of soil moisture and groundwater recharge in the south-eastern part of the country [4].

Determination of the main physical and chemical properties, and the macro and microelement content of the soil helps to evaluate later prospects of the plantation to be installed, and the opportunities for production at a later stage. In this study we show the results of planting examinations; regarding location, type and analysis of the soil main physical parameters.

MATERIALS AND METHODS

Soil sample collection. The collection of samples took place among 2009 and 2015 mainly in the Danube-Tisza Interfluvium. The collection of soil samples have been done by registered experts of soil protection, being in connection with the Soil and Plant Testing Laboratory of the Faculty. The results of the location and type of plantations for each year were also followed. Soil samples were taken in the planned plantation fields of the farmers, from soil segments in different depths (0-150 cm) and topsoils (0-30 and 30-60 cm). 3150 samples were measured.

Analytical testing methods were made in the Soil and Plant Testing Laboratory of Faculty of Horticulture and Rural Development (Kecskemét), which uses standard methods involved in the accreditation certificate (NAT-1-1548/2011 and 2015). Analysis of all the examined parameters was based on certified methods, detailed in the laboratory certificate. Water-soluble salt content was estimated on the base of electrical conductivity of the soil, filled up with water, and the data table of the standard description (MSZ-08-0206-2:1978). Statistical analysis and demonstration of data were performed by Microsoft office excel program. Average levels, standard deviation and statistically significant differences were estimated.

RESEARCH RESULTS

The number of soil samples arriving to our laboratory is significant. The registered expert colleagues of the soil protection collected soil samples from 789 orchards among 2009 and 2015. Soil samples were taken in twelve Hungarian counties, dominantly in our

region, mainly Bács-Kiskun county (88.5%), followed by Pest county (4.5%). The location of the plantations is shown in Figure 1.

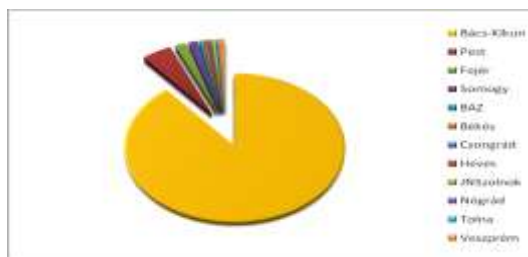


Figure 1. The location of the plantations of soils were tested in our laboratory

The ratio of plantations in each year is shown in Figure 2. Most vineyards and orchards were planned in 2011, followed by 2015.

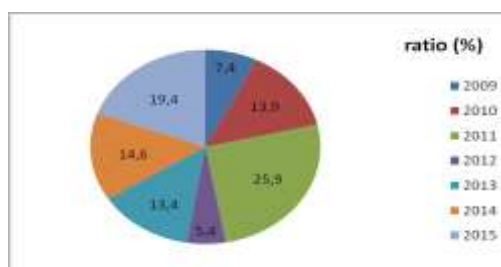


Figure 2. Relative amount of planned plantations (expressed in %), examined in our laboratory among 2009-2015

The dominant type of plantations in our region was vineyards in the examined period, with about 80 percent rate.

Laboratory soil tests, made among 2009 and 2013, demonstrated moderately alkaline chemical status in these fields, with low soluble salt content (Table 1). EC was higher in orchards. Organic matter content was low as well. Organic matter content was significantly higher in the fields of planned orchards ($p < 0.001$). There was not any difference in CaCO_3 contents.

Table 1

Main physical parameters in soil samples

	pH(H ₂ O)	Soluble salt m/m%	CaCO ₃ m/m%	Org.matter m/m%
Grape				
average	8.14	0.03	6.28	0.85
SD	0.34	0.02	5.28	0.51
Fruit				
average	7.53	0.09	6.35	1.28
SD	0.65	0.04	6.96	0.81

CONCLUSIONS

European agricultural fund for rural development support is provided to agriculture, forestry and environment, natural resources management as well as to the sustainable development of rural economy. Within the fruit and vegetable framework of the action, supports can be granted to supplementary planting operations, changes in the breed structure of plantations, re-plantation for modernization purposes and to the establishment of new plantations in orchards. Support for the plantation and replantation of orchards is

supported exclusively under the Rural Development Programme. Eligible fruit species are apple, pear, quince, naseberry, plum, cherry, sour cherry, apricot, peach, walnut, hazelnut, and almond in homogeneous and mixed stocks. The normal renewal of vineyards which have come to the end of their natural life, namely, the replanting of the same parcel of land with the same variety according to the same system of vine cultivation, shall not be supported. The technological development of high-skilled industries contributes to the Europe 2020 Strategy and Hungary's goal of increasing the employment rate to 75% by increasing the number of employees. The operation also includes improving the efficiency of energy use in horticultural economies to reduce the environmental impact of the sector.

The use of inadequate quality sprinkling water sources and the pollution of water should be avoided as [5]. The use of waters from different origin is also essential in the cultivation in the Danube-Tisza Interfluve, so the quality of irrigation water should be far considered. The EU Water directive draws attention to preparation, development and implementation of efficient irrigation developments; the protection of groundwater reserves, and the use of surface waters, if it is possible. Aquifer systems can only be used for micro irrigation. The criterion of good quantity status is that the quantity of water taken out does not exceed the stock of waters that can be utilized.

In the Danube-Tisza Interfluve, physical quality and chemical composition of the soils and the underlying rocks have a wide variety. We showed the preliminary results of our soil tests in this paper.

The results of our study confirmed the following:

- Planned plantations layed largely in Bács-Kiskun county and the south-eastern part of the country.
- Most plantations examined, were vineyards.
- Laboratory soil tests showed moderately alkaline pH and low soluble salt content, estimated under EC value.
- CaCO₃ contents showed moderately calcareous soils, which are frequent in our region.
- Organic matter content (expressed in humus%) was low in the samples, and moderately higher in plantaion land of orchards.
- Detailed results of the soil tests regarding location, year, type and soil depth will be shown in other papers.
- In our study we emphasize that the quality of soil should be controlled before planting, and regularly monitored in every five years thereafter.

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