ASPECTS OF ORCHARDS CADASTRAL INFORMATIONAL SYSTEM

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Abstract

The purpose of Orchards Cadastral Informational System consists in providing real data and in systematically keeping records, from technical, economic and legal point of view, of terrains from national fruit growing heritage and of related real estate, in order to evaluate them, to make capitalization more effective, to establish fair taxes, trading, leasing or concession them, statistical processing necessary to technical and economic documents etc. Also, in order to make a more efficient management and exploitation of the potential of a fruit growing area it is required the realization of a Orchards Cadastral Informational System, because in the absence of a system based on technical, economic and legal data of every parcel, the land systematization works may have a negative impact on soil and environment. To support the reform of the fruit growing sector from Romania, that according to socio economic reports appears to be in constant decline, the European Union funds the rehabilitation projects of this sector, wishing, especially, to protect traditional fruit growing areas. Also, to support the farmers from Romania, who wish to access European funds through projects for establishing/rehabilitation of fruit growing units, I suggest to implement cadastral summaries on the level of cadastral plot, which must contain both basic data and specialty data specific to each system. So, by centralizing data from summaries of fruit growing real estates across an administrative territorial unit, can achieve clear and accurate evidence, based on real data from the field, useful both for institutions managing Agricultural Informational System and for farmers of fruit growing plantations. As in any field, good development depends on the quality of cooperation and collaboration between institutions, collaboration between Agency for Payments and Intervention in Agriculture and Cadastre and Land Register National Agency, represented in the territory by Cadastre and Land Register Offices, respectively Cadastral GIS services of the municipalities, would facilitate completion of cadastral records.

Key words: Orchards cadastre, digital cadastral plan, cadastral plot, cadastral and specialized data

The **Orchards Cadastral Informational System**, component of Agricultural Cadastral Informational System, represents an uniform and mandatory system of technical, economical and legal evidence, which realize the identification, registration, delimitation and representation on cadastral maps and plans of all terrains from national fruit growing heritage and of the related real estate, regardless of their destination and their owners (Law of fruit growing, no. 348, 2003; Methodological norms of realization and record of the fruit growing cadastre, 2004). The purpose of the system consists in updating or drawing up plans by centers and fruit growing plantations, the correct tax on agricultural income, trading, renting or leasing them, statistical processing necessary to produce economic and technical documents etc.

From data of cadastral records of Cadastral Informational System, centralized and processed selectively, may result topo-cadastral maps and plans specific to each area of economic activity (Technical normative for general cadastre introduction, 2001). The purpose of these systems is to provide real data regarding terrains and buildings of any kind and their owners or possessors, respectively of more efficient assessment and capitalization. Only by entering the Cadastral Informational Systems by spheres of activity and analyzing in time the use of resources can speak of sustainable development, environmental protection, rational use of terrain through land management works, by preventing the chaotic expansion of habitable, by development of real estate market through systematic studies and urban planning. Unfortunately, unlike most European Union member states, Romania still lacks a land cadastre, which must contain essential data regarding technical, economic and legal situation of public and private properties at the level of administrative territory (Cadastre 2014 A report of the activities of the FIG Commission 7 Annual Meeting working group on modern cadastres, 2011). Also, the efficiency of automation of cadastral works increases when processing and analyzing data and information is

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quick and easy, for they reflect, at any time, the reality on the ground (Bădescu G., 2007).

The importance of updating such data and information, regarding the form, the area, the category of use, the owner and others are due to the dynamics of real estate circulation in a society whose market economy is constantly changing. Rapid consultation, by policy makers, of cadastral documents, whose data and information are permanently updated, is possible only if these documents are computerized (Puşcaş M., 2004; Tămâioagă Gh., Tămâioagă Daniela, 2007).

Are presented the legislation side of the Orchards Cadastral Informational System, the technical operations of database realization and the model of the summary of the fruit growing real estate.

MATERIAL AND METHOD

In accordance with article 4, paragraph 1, of the Law of fruit growing no. 348/2003, the **fruit growing heritage** is made up of fruit trees and shrubs, no matter the culture, strawberry plantations, fruit-tree nurseries, including land for crop rotation, the land in preparation for planting and inside town land planted with fruit trees, fruit shrubs and strawberries. At the same time, in Annex 1 of the same law, are defined the following **components of fruit growing heritage from the territorial point of view:**

1. **Fruit growing area** is the land area from a big natural ecosystem with a geographic and climate structure relatively similar.

2. **Fruit growing basin** is the land area where tree species meet special conditions of culture regarding soil and climate factors, which can grow more fruit species with similar characteristics.

3. **Fruit centers and holdings** are components of a fruit growing basin and are characterized by a pronounced specialization of the culture of certain species of fruits.

In the same annexes are defined **types of culture systems**:

1. ***Extensive system*** or classic system is characterized by great vigor trees, with globular crowns and with 150 – 200 trees/ha, the economic duration of the plantation is higher.

2. ***Intensive system*** is characterized by small or medium vigor trees, with 600 – 1200 trees/ha, and the fruits are of superior quality.

3. ***Superintensive system*** is characterized by small vigor trees, led by cuts in flattened crowns with high density, with up to 2500 trees/ha and producing high quality fruits.

According to article 6, paragraph 4, fruit trees and shrubs located in the courtyards, pastures, hayfields, alignments and protection curtains, called **sparse trees**, and whose products are not subject to sale on the market are not part of the fruit growing cadastre and according to paragraph 5, sparse tree records shall be kept separately.

By Orchards Cadastral Informational System are accomplished:

- the identification, measurement and representation of the parcels and other real estate related to fruit growing sector, on cadastral plans and maps;
- registration in cadastral documents and computer data storage media;
- identification and registration of owners or legal holders of real estate;
- providing data for the correct setting of the system of taxes and fees.

Technical work for the realization of the Orchards Cadastral Informational System the are carried out by specialists at the Offices of Cadastre and Land Registration, in compliance with the technical standards developed by the National Agency of Cadastre and Land Registration.

The classification of terrains from the national fruit growing heritage, in classes of pretability, of quality and other specific information, are obtained from the soil and agrochemical studies.

Stages of Orchards Cadastral Informational System shall be carried out on the basis of technical, economic and legal functions, as follows:

I. Cartographic basis required in order to achieve the Orchards Cadastral Informational System

Representation on maps and cadastral plans of the limits of the plots and other real estate property pertaining to fruit growing sector, will be made on the basis of topographic maps. Topographic maps were made on the basis of national geodetic networks, classes A, B and C, as well as networks of thickening and lifting, D and E.

Execution, expansion, upgrading and maintaining in good condition for use of national geodetic networks is done through compliance with the technical regulations in force, by National Agency of Cadastre and Land Registration and the territorial offices subordinated to it. If, at some point, the existing geodetic networks will be expanded through geodetic works necessary for carrying out the various items in the field, they will be made by authorized specialists, through compliance with the technical regulations in force.

The scales of representation of the parcels, on maps and cadastral plans, will be 1 : 1000, 1 : 2000 or 1 : 5000, and will be chosen depending on the average size and of their number.

II. Territorial delimitation of the fruit growing area

To get a viable Orchards Cadastral Informational System, must be made in technical works to determine the exact fruit growing real estate, for their representation on maps and cadastral plans.

For realization of Orchards Cadastral Informational System will go through the following steps:

- territorial delimitation of fruit growing areas;
- territorial delimitation of fruit growing areas intended for the production of top quality fruits and specification of the designation of origin of the variety.

After identifying the boundaries of the fruit growing areas and other real estate related to fruit growing heritage, the scale of their representation, on

maps and cadastral plans, will be chosen depending on the size of the geographical area.

For a more accurate identification and delimitation of the fruit growing areas, it will analyze all existing cartographic and script documents for that area, obtained through the works of introduction and maintenance of the Land cadastre, through territory organization works and the projects of establishing plantations.

III. Identification and registration of land use category

In the category of use "orchards", whose symbol is L, it fits the land planted with fruit trees and shrubs, including those prepared for planting, situated in the fruit growing areas.

The subcategoris of category of use "orchards" are: classic orchards (L); intensive orchards (LI); fruit shrubs (LF); fruit-tree nurseries (LP) and mulberry plantation (LD).

At the classification of the subcategory *"plantation of fruitful trees",* account shall be taken: *age of the plantation*(young and fruitful), *plantation status* (very good, good and bad), *location* (flat land, terraced land and sandy soils), *slope of the land* (very weak inclined 0 – 5%, moderately inclined 10.1 – 25% and strong inclined 25.1 – 50%), *the nature of the cultivated varieties* (grafted trees or ungrafted) and *land improvements* (drainage, irrigation and anti-erosion improvement).

IV. Recording the class of quality and class of production of land

The registration of classes of pretability and of quality of the land, are carried out by the counties Offices of Cadastre and Land Registration.

The inclusion in **6 classes of pretability** of the agricultural use categories of each cadastral plot, is based on pedological studies, as follows: land without limitations; land with limitations or weak, moderate, severe and very severe restrictions, with the possibility of correction and without possibility of correction.

The inclusion in **5 classes of favorability** (**quality**), is made on the basis of soil evaluation notes, as follows: I: 81 – 100 points; II: 61 – 80 points; III: 41 – 60 points; IV: 21 – 40 points and V: 0 – 20 points.

In cadastral register of the parcels, quantitative and qualitative assessment of land, is done through the class of pretability and class of favorability.

V. Cadastral record of the parcel

Cadastral data of the parcel are:

- **Basic data:** name/name and address/office of the owner of the parcel (individual or legal person) and quality under which one holds; place name of the parcel; cadastral number; area in hectares and square meters. Calculation of the surfaces is done analytically, from the coordinates of the breaking points on the outline. The constraint of surfaces calculated values is made in accordance with the Technical Regulations for the Introduction of the Cadastre.
- **Specialized data**: the mode of exploitation of the plot (direct and in lease), the plot's surface by species and of the variety/varieties, direction of production (consumption fruit or industrial processed and planting material), natural features (the class of pretability and of favorability of the soil, slope, terrain exhibition and altitude above sea level, in meters), irrigation (type, irrigation norm and watering), the type of crop (culture pure and associated), the type of culture system (system extensively, intensive and superintensive), rootstock (for grafted fruit trees), planting density (the distance between the rows and between the trees on the row), the number of trees/ha or missing trees/ha, the actual level of occupancy or goals in plantation, plantation age, plantation status.

VI. The final documents of the Orchards Cadastral Informational System and its reception

According to the methodology of realization of the Cadastre and of the system of technical and legal cadastral records, the final documents of the Orchards Cadastral Informational System are: cadastral data summary; cadastral registry of the plots; the alphabetical index and owners residence; cadastral registry of the owners; real estate registry; the centralizing summary of the real estate by owners and by category of use and cadastral plan.

According to the *Methodological norms of realization and record of the fruit growing cadastre,* the reception of the works is made by the county committees. The officialization of the completion of works is done on the basis of a report of receipt, made out in three copies.

VII. The management and maintenance of Orchards Cadastral Informational System

The periodical updating of the works of Orchards Cadastral Informational System is carried out every 10 years. Updating and data storage are responsibilities of counties Offices of Cadastre and Land Registration.

The data of Orchards Cadastral Informational System may only be used for the following purposes: determining the agricultural income tax; sale or purchase of land with fruit growing use; the lease or concession of the land with fruit growing use and statistical processing needed in drawing up economic and technical documents.

VIII. Alignment dispositions to the requirements of the European Union

According to the legislation of the European Union, member countries must establish **Register of fruit growing plantations** and the **book of fruit grower**.

Agricultural producers will pass in the register of fruit growing plantations the identification data of plots, of fruit growing plots and of areas by variety from each plot, and in the book of fruit grower, the production and capitalization mode.

IX. Rehabilitation and expansion of fruit growing plantations

In support of farmers in Romania, the European Union supports the projects of setting up plantations on new surfaces, the rehabilitation of fruit growing plantations (with change of structure of the fruit trees), through the acquisition of planting material, as well as work performed by third parties for deforesting, soil preparation, planting and replanting, with the exception of fattening soil, by providing European funds through the Agency for Payments and Intervention in Agriculture, SAPARD, the European Fund for Agriculture and Rural Development etc.

At the same time, the granting, by the Agency for Payments and Intervention in Agriculture, of subsidies and vouchers, for the purchase of pesticides and control of diseases and pests, to the owners whose fruit growing plantations are registered in the **register of fruit growing plantations** and have varieties of biological categories in the approved range, through the Official Catalogue of plant varieties and hybrids grown in Romania, by the European Union.

In what concerns the obligations that the owners or legal keepers of fruit growing plantations have, they must:

- to carry out maintenance work, particularly treatments for control of pests and diseases, so as to ensure both the productions specific to varieties grown, as well as the protection conditions of environment and water;

- to ensure protection of soils and hidro landscaping improvements, existing on areas that they operate, by cleaning and repair water collection channel on the hillsides, keeping in operating status the irrigation systems, as well as maintenance of traffic routes, roads and areas of return.

X. Reform of the fruit growing sector

From the point of view of surface, for the past 20 years, the fruit growing industry has been in a steady decline, with negative consequences not only on the economic development of the rural environment, but also on the quality of life of communities in areas of traditional fruit growing and this sector's contribution to protecting the environment (Socio-economic analysis in the perspective of rural development 2014-2020, 2013).

During the period 2002 – 2012, according to the National Institute of Statistics, areas occupied by orchards have declined by about 30%, being deforested 65 thousand hectares, the total area being 142 242 ha in 2012.

The largest deforested areas were registered for peach tree, apricot tree, pear tree, cherry tree, apple tree and sour cherry tree, species to which we are also facing with the biggest imports. Fruit production is in fact fluctuating, due to the influence of the longer-term climatic factors, but also the age of plantations. The lack of storage space is also a major problem.

By joining the European Union, Romania can trade on the European market only varieties of biological categories described in the range approved by the Official Catalogue of plant varieties and hybrids grown in Romania.

RESULTS AND DISCUSSIONS

In order to achieve technical and specialty evidence system of the Orchards Cadastral Informational System, it was chosen for study a fruit growing area of 0.76 ha, from horticultural farm "V. Adamachi" of the Experimental Resort of University of Agricultural Sciences, located in the north-western part of the expanded inside area of the municipality of Iasi. On the basis of cadastral data of the General Technical Cadastre, obtained for the Northwest area of the municipality of Iasi and accepted by the GIS-Cadastre Department of the City Hall of the municipality of Iasi in 2010, has been drawn up the basic topographic-cadastral plan, at the scale 1 : 1000, for the studied cadastral plot 1L, included in area C of the inside area of the municipality of Iasi, respectively cadastral sector no. 13 (*figure 1*).

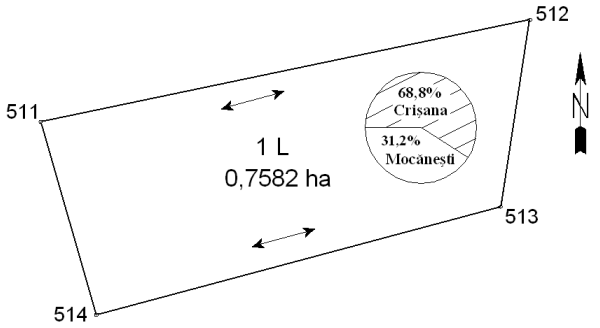


Figure 1 **Basic topographic-cadastral plan of the studied fruit growing real estate**

On the basic topo-cadastral plan of the studied fruit growing real estate and fruit are shown the following elements:

- the cadastral number and category of use of the fruit growing plot;
- plot area in hectares and square meters;
- the direction of the rows of trees, which have been drawn on the general direction of level curves;
- the varieties of fruit trees / degree of occupancy as a percentage.

For a better organization of field work and systematization of the basic and specialized cadastral data for each of the properties is implemented a model document, generically named „**Summary of the fruit growing real estate**" (*table 1*). The document contains, for each of the individual properties, cadastral data and information collected in the step measurements (address of the real estate, property sketch, category of use, characteristics of property etc.), information from the real estate or land owners, from the Office

of Cadastre and Land Registration (cadastral data of identification etc.) and other specialized services.

On the land register plot was inventoried a number of 486 trees, all from specie sour cherry, variety Crişana and Mocăneşti, resulting the current level of occupation of 96.43% and goals in plantation of 3.57%, through lack of 18 trees.

By reporting the total number of trees (504 trees) to the area of the cadastral parcel obtained from topographical measurements (0.76 ha), it was deduced a theoretical number of 665 trees for the surface of one hectare and in accordance with Annex 2, from the fruit growing law, results that the type of culture system is the intensive system.

The plantation was established in 2008, by planting two alternative lines, because Mocăneşti variety is for pollination.

By reference to the actual age of the plantation (6 years), the current state of the plantation is very good, because in accordance with Annex 3, from the fruit growing law, the normal duration of exploitation of classic sour cherry plantations is 20 years.

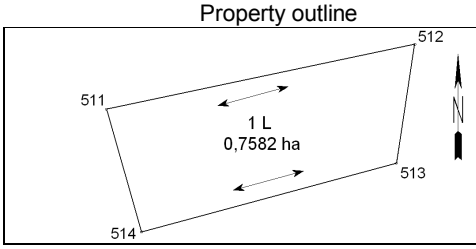
Thus, by centralizing data obtained from the summaries of the fruit growing real estate from the range of one administrative-territorial unit, can be achieved a clear and proper evidence, based on actual data in the field, useful both for institutions managing the Orchards Cadastral Informational System, as well as for users of fruit growing plantations.

Table 1

The summary of the fruit growing real estate

County: IASI Administrative unit: IASI Code SIRUTA: 95060 Code inside / outside city: 1	Nomenclature: L-35-32-A-c-3-II-4-a No. cadastral sector: 13 No. cadastral plot: 1 L No. cadastral register:

Property outline



Coordinates and surface inventory

No. point	Coordinates in Stereo-70 Projection System	
	X (m)	Y (m)
511	636046.142	692929.766
512	636076.457	693074.720
513	636020.926	693065.975
514	635988.921	692946.243
SURFACE (mp)		**7582**

A. Fruit growing land data base

Use category	Use subcategory	Destination group code	Quality class	The zone inside territory
Orchard (L)	Classical orchard (L)	Agriculture destination fields (TDA)	92 points	Copou – Iasi, M. Sadoveanu neighborhood

B. Landowner data base

Landowner's name	➢ U.S.A.M.V. Iasi / S.D. / „V. Adamachi" farm
Landowner's Residence / Headquarter	➢ No. 9 M. Sadoveanu alley, Iasi
Landowners group code	➢ DS – state public domain
Ownership of the field	➢ Exclusive

C. Real estate cadastral records speciality data base

Type of soil	➢ Cambic chernozem
Pretability class	➢ Land with few restrictions
Favorability class	➢ 81 – 100 points of cadastral creditworthiness
Average slope of the plot	➢ 14,49 % (slightly inclined)
Average altitude of the plot	➢ 142,1 m – Black Sea reference system
Slope exhibition	➢ Semi-sunny (South - East)
Anti-erosion arrangements	➢ Parallel rows of fruit trees with the general direction of level curves
Type of culture	➢ Pure culture
The type of culture system	➢ Intensive system
Species name and surface	➢ Sour cherry tree = 7582 mp
Variety and surface / rootstock	➢ Crişana = 5213 mp x Mocăneşti = 2369 mp
Planting distances	➢ 3.9 m x 3.8 m
Current occupation degree	➢ 486 fruit trees (96.43 %)
Current age of the plantation	➢ 6 years
Current stage of the plantation	➢ Very good

CONCLUSIONS

The development of cadastral database of Cadastral Informational Systems, on GIS platform of specialized software, creates advantages in the management, operation and updating of records based on information that renders the cadastral situation on the ground at all times.

The most efficient possible use by the users of fruit plantations, basic data and expertise, cadastral records generated through statistical representation getting, based on real and accurate information gathered on the ground, regardless of their complexity and volume.

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