

The Cultivation of Chestnut, in Dibra, Kukes and Tropoje District in Albania

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Abstract: Chestnut (*Castanea sativa* L.) is a species that vegetates and produces almost in all the territory of Albania. It can be found in large surfaces in mountainsides and hills in Kolgecaj and Lekbibaj of Tropoja, in Shenmeri of Kukes, Dukagjin, Mes and Shllak of Shkodra, Kashnjet of Lezha, Shupal of Tirana, in Pogradec, in Lefterhori and Muzina of Delvina, in Dhrovjani and Leshnice of Saranda .

With scarcity it can be found in Berati, Skrapar, Pwrmet, Gramsh, Tepelenw and Kolonjw on a total surface of 8000 ha. But, inside these surfaces with chestnut, there are hundreds of hectares suitable to be cultivated with chestnut, increasing, in such a way the number of existed ones.

Such free surfaces, created by degradation or deforestation must be planted with chestnut trees. They are more suitable, not only for their agro-pedological quality , but also that are far away from inhabited places . The chestnut trees can be cultivated and administered from everyone that makes his weekends or holydays in these surfaces.

This massives, although without any care, could give round 50-70 kg fruits /tree.

If they will be treated properly, their productivity and quality will be increased.

Keywords: Treatment, Cultivation, Agro Technique, Quality, Chemical, Adaption, Biotechnology.

I. INTRODUCTION

The chestnut fruit is one of Albanian agricultural product that has dominated our export, and covers 9 % of European import. Therefore we are obliged to develop a policy and a strategy for producing conform EU standards. In such a way we can increase the economic effective of the export and the incomes of our farmers.

Chestnut in our Country has a great economical importance , not only for the wood value , but also for its fruit. An other characteristic that makes it more valuable is that, in comparison with the other leafy trees, is the fast growth and its productive capacity to regenerate vegetatively and to put out new shoots also at an advanced age . An other characteristic of chesnut is its capacity to ameliorate the earth .

In the zone of this study, the chesnut exstends on a total superface of 12500 ha, mainly in Tropoja, Shllak, Mes and Shosh, Kukes, Peshkopi, Dukagjin, Derjan, Kashnjet, Shupal, Pogradec, Lefterhor, Muzine, Dhrovjan, Leshnice, etc.

From the ecological point of view, chestnut growths in low and average mountainous Zones, in coffee-brown earths, excluding the carbonatic earths. Chesnut like the earths with acid reaksion and reach with phosphor and potassium with volcanic origin.

It develops also in the decalcificated brown earths, but l-

ikes not the heavy earth with alkaline reaction.

Concerning temperature and moist, the chestnut is typical mezofile specie It doesn't like the dry, cold and with misty stations. It doesn't need also many light.

It reproduces with seeds or vegetatively. The frutification begins for the trees with seed origin at the age of 20-25 years, but for the trees with shoots origin at the age of 8-10years. The seeds , if are deposited in places with moist and cold, have a very high germinative capacity- up to 80-90 %.

The planting with seedlings is the most usual way. To create chestnut forests for wood production , normally are used seedlings of two years old transferred seedlings 3 years old with the scheme 2-4 m.

To create coppice for fruit , normally are used seedlings transferred and grafted, almost 5-6 years old. In this case the holes must have the dimensions 1x1x1 and with a distance between them 8-10 m

To produce the grafted seedlings, normally must transfer the new saplings, 1-2 years old in the place prepared for this scope, cutting their rots and placed 50-80 cm , in row and 70-100 cm between rows.

In the third year the stalk must be cutted and , after a year the new sapling, the best one , must be let in the transferring place 2-4 years;

After 5-6 years in this place, must be done the grafting;. After the grafting the seedlings must be let in nursery for 18 months and after that they can be planted.

The grafting can be made also in the place of planting. For over grafting must be used the best, and the baggiest piece of the chestnut.

Chestnut must be extended in a large scale in all the lower and average mountain zone of our country to create in such a way the simple coppice for fruit production, and also coppice combined with other species for wood production. The chestnut tree suffers from two dangerous diseases: The disease of colour (*phytoftora cambivora*) and the bark cancer (*Endothia parastica*). To protect the tree must be taken measures .

Castanea sativa Mill , reches a height up to 20-35 m with u trunk up to 2m.

The leafs have a reform with deep furrwus or spiral fissures – 16-28 cm long and 5-9 cm large.

Bisexual flowers are born in 10-20 cm, and, the male are set in the upper part, the female in the lower part.

The chestnut flowers appear by the end of Une , in July , and up to autumn . The female flowers contain 3-7 pieces in brown colour. They fell during October.

The female flowers, to be protected from the rapacious are covered by a sheathe. [4].

The farmer, some time produce only a big piece for cup-

ule, but normally 2-4 eatable pieces, nevertheless they could be smaller.

The chestnut tree needs a moderate and moist climate for the good development of the pieces. It feels the cold of autumn and the freezing of the spring. It tolerates the calcareous formations. The development in condition of forest, it tolerates the shadows. The leaves of chestnut tree are a good food for animals, including Lepidoptera and Coleophora anatipennella.

II. THE MATERIAL AND THE METHOD

The process of realization of this study has past some phases, having in consideration the actual situation of chestnut species and the needs of the future; the new plantings, the characteristics and produce capacities; the study of nurseries and the possibility of producing the seedlings.

The first study's objective has been the determination of the actual situation of chestnut trees: the group-ages, sanitary situation, topographical extension, surfaces that could be rehabilitated, the costs of this rehabilitation according to different levels.

In conclusion we obtained data for the surfaces covered with chestnut, possibilities for rehabilitation and for all its sub-objectives. Has been registered identification elements (the district, commune, village, the codes, ortophotos, forest economy and parcels), total surface (hectares or number of trees), average age according to classes of age (0-20, 21-40, 41-60, 61-80 and 81-100 years), the average number of trees per hectare, the average yield for the latest 10 years (kv/ha or kg/one tree), health situation of the trees (good, average, and not good, in ha/tree), the infection from the bacterial diseases, cancer, worms (light, average, heavy in ha/tree, data for the earth (mechanical content, the slope, the system of terraces, deforestation, the sea-level and relative height (m), and notes about the problem.

In the study were included also the optimal zones in which the chestnut trees have had a good development, the forms of cultivation in regional level, and the evaluation of the possible potentials for production in regional level.

In conclusion we obtained data about cadastral maps of surfaces covered with chestnut trees, the actual situation and the potentials for the new plantings.

In maps have been determinate the zones for new plantings with chestnut trees.

The evaluation of the earth, the agro-pedological analyses of the earth for the new blocks and the data about the climate and the earth, determination of the productive potentials according to the regional places.

The study about determination of chestnut's structure, the reports between the home cultivars and they of import that can be used in the planting structure.

The study and the description of situation of nurseries, productive capacity, the production methodology and the organization in the future.

As a result were determinate the needs for new nurseries, the type of organization, the productive methodology, the productive capacity and the relations

between the home product of seedlings and the imported ones, and for the production variant according the modern methods that are aplicated in the world.

III. THE RESULTS AND THE DISCUSSION

From the elaboration of all obtained data during 4 years, it is evaluated and determined the surface covered with chestnut trees.

The chestnut forests in Tropoja district have an large extension. It is the phyto-climatic zone of chestnut at the foot of the Albanian northeast Alps (Shkelzen, Maja e Hekurave, Korore e Nikaj Merturit)

The terrain is mainly undulating, with a general southeast direction, with an average slope 20-25 gr. The massive intersected from Valbona river, Gashi river and some villages with agricultural and fruit plantations. The main massive are: the massive in the upper part of Bajram Curri town and the massive of Kernaja. Normally the forest massive the chestnut is in 360-1000 m sea level, but it can be found in separated trees or small groups from 200 to 1100 m. sea level

In Tropoja district this species is in his natural area I, the groups of trees have the character of a forest that have a good natural development, despite the fact that are historically valuated mainly for fruit production. The trees have the seed or coppice origin with an average age from 90 to 150 years. The sea level varies from 300 to 700-750 m. and, rarely up to 800-1000 m (in places with an east direction)

The most appropriate expositions for the chestnut forests are east, north-east, north and south-east expositions..

The bigger massive has a surface of about 2000 hectares, concentrated in 7 Communes:

In Bujani commune round 600 ha, in Markgegaj commune with 500 ha, in commune of Tropoja with 500 ha, in Lekbibaj commune with 270 ha, in commune of Paçi with 15 ha, in commune of Fierza with 15 ha and in Municipality of Bajram Curri with 100 ha.

The configuration and the extension is very wide, it begins from Nikaj Merturi in Lekbibaj villages, Gjonpalaj, Shengjergj, Lower Curraj, Mulaj and Tetaj, in Krasniqe zone, in villages of upper Dushaj, Selimaj, Lekurtaj, Gri, Rasnje, Markaj, Kolgecaj, Margegaj, and Shoshan; it extends in Gashi zone with the villages Berbat, Kernaje, Gosturan and Mehejan and terminates in Shimshan with the villages Kamenice and the old Tropoja and in Bytyçi zone in Demaliaj.

The massive is traversed from a net of paths in the inner part that connect the administrative centers and homes. During the winter, and especially in time of very high rainfalls, the movement of the means of transport could be made with difficulties.

The extension in typical hearths "in situ":

a) *Margilaj village:* It is the most beautifully village of the zone. It is situated in 632 m sea level, with a east and south-east exposition, with slopes, hills and valleys covered with chestnut forests. The relief is mainly

undulated. The village is situated near B. Curri town and is the center of villages (Bujan, Dojan, Rosnje , Markaj). Bujan village bounds with Kolgecaj and Gri villages. Its territorial extension is in different levels, beginning from 250 m. in Fag to 632 m. in Markaj.

b) *Gri village*: It is the only village in Tropoja that his forest territory is not separated from the village. It is distinguished from the large surfaces covered by different vegetation and watersheds. The upper part of the village is covered by the perennial chestnut forest that makes all the zone exceptionally beautiful, and also increase the economic values for the farmers and ecological values for other villages of this region.

Palkova of Gri is the most beautiful massive of chestnut. It produces fruits of a great quality. Grin village has protected up to now two natural monuments.

c) *Blini of Grise*: of exceptional dimensions, habitat and beauty. The shadow of this tree has been historically place of assembly and taking decisions from men of Krasniqi, Nikaj .

d) *The cultural monument "The chestnut of Bajram Curri"*: where the brave men took force to be ready for new battles again foreign invaders.

e) *Kolgecaj village*: It is situated in 340 m. sea level .One of the most beautiful villages of the northern part of B.Currit. Here are situated the plains of Bisheva and Markaj, covered by chestnut forests. Above the chestnut forest is Bisheva with meadows and pastures. Kolgecaj Village is bounded with the villages Markgegaj, Cernice, Markaj and Dojan. The high plateau, covered by chestnut tree has an east exposition.

f) *Kernaje Village*: The nature of this village, except the beauty, it has also many rare advantages : here are developed in particular fruits like apples, plumes, pears, grapes, mulberry and cherries. The chestnut forests in every quarter of the village create a source of annual fruits.

In Dibra district the chestnut trees can be found located in two comunnes : In comune Maqellare, round 60 ha, concetrated in villages Lower Kerçisht, Poces, Erebare and Grezhdan and in Tomini comune round 15 ha in villages Ushtelence, Zdojan, Pilafe, Catush and Selan. Actually this district realises an annual produce of aproximately 180 tons with meadows and pastures. Kolgecaj Village is bounded with the villages Markgegaj, Cernice, Markaj and Dojan. The high plateau, covered by chestnut tree has an east exposition.

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This surface for every district is as follows:



Fig. 1.The chestnut missives in study zone.

Tab.1. The surfaces of district

District	Naming of place	aria / ha
Bulqizë	EP Shupenzë	30.44
		30.44
Dibër	EP Deshat - Maqellarë	393.83
	EP Luzni	72.50
	EP Muhurr - Sinë	34.00
		500.33
Kukës	EP Dukagjin	630.83
	EP Goskë	12.50
	EP Mamëz - Kalimash	6.00
		649.33
Tropojë	EP Berishë - Bytyç	4.33
	EP Lugina e T'planit	9.50
	EP Lugina e Tropojës	105.30
	EP Nikaj - Mertur 1	333.96
	EP Nikaj - Mertur 2	79.79
	Jshetfonditpyjor	1467.12
		2000.00

The conclusions of the study about the earth:

From the ecological point of view, chestnut lives in low and average mountainous Zones, in coffee-brown earths, excluding the carbonatic earths. Chesnut like the earths with acid reaksion and reach with phosphor and potassium with volcanic origin.

It develops also in the decalcificated brown earths, but likes not the heavy earth with alcalin reaction.

Concerning temperature and moist, the chestnut is typical mezofile species It does'nt like the dry, cold and with misty stations. It does'nt need also many light.

The study of the earth is a compare program of inventory and interpretation of earth sources, based in work models that explain relations of the characteristics of earth parts and earth sght.

This treatment is considered valuable also in the this study and as the main reason is the fact that in the study

zone there is a clear relation between geomorphologic earth sight and the predominance of every from 5 factors earth formative, which are corresponding for every changeability of the earth of the place.

The basic information for the determination of these dominant earths is obtained by field study and base acknowledgement. The classification of the earths is based in W.R.B. , the classification according the Manual of European Buro of earth (ESB Manual).

In Debra district the content of clay in the first layer is 27.9 to 31.1 %, with a general mean 32.05 %. From the data can be seen that 70.5 % of these earths have the content of clay over 30 %, and only 29.5 % of these have it under this cipher.

In the second layer the content of clay, in comparison with the first layer, increases with 0.87 %.

From the data we can conclude that all the analyzed earths are of the type of well balanced clay earths (clay loam).

The earths are a little bit acid and a little bit basic. The PH varies from 6.45 to 7.4, with a general average 7.01. It is of the same level also in the second layer. From the study can be concluded that 47.7 % of the earths are a little bit acid, 11.7 % neutral and 40,9 % a little bit basic. The content of the humus varies from 0.87 to 3.15 %, with a general mean of 1.56 %. In the second layer, compared with the first one, the content of humus decreased with 37.15 %. According to the data the poor earths occupy 45.5 % of the studied earths, with an average level of 52.3 % and the reach – 2.2 %.

In Kukës district, the content of clay get from 26.8 to 43 %, with a general average from 35.2 %. According to the data, 91.3 % of these earths have the clay over 30 % and only 8.7 % have it under this cipher. In the second layer the content of clay has the same percentage of the first one. According to the data the higher content of clay have the earths of Has district, and lower have the earths of Tropoja district.

According to the data 82.6 % of the earths, are of the equilibrated clay type (clay loam), 8.6 % of the equilibrated earths and also the clay earths.

From the study can be concluded that 95.7 % of the earths are a little bit basic , and only 4.3 % are a little bit acid. It varies from 6.9 to 7.7 with an general average of 7.3 . In the second layer the PH has the same ciphers. The content of the humus varies from 0.96 to 2.72 %, with a general mean of 1.73 %. In the second layer, compared with the first one, the content of humus decreased with 39.1 %. According to the data the poor earths occupy 39 % of the studied earths, with an average level of 61 % .

An other factor is the climate with two its basic elements: the rainfalls and the temperature. The rainfalls are of priority. The average annual temperature for the studies zone from 1961-1990 are shown in fig. xx. The influence of the mountain in the east and in north of the country, can be seen clearly, with the average temperature that varies from 4 to 12 gr. C, in comparison with the lower zone, the plains near Adriatic and Jon seas that have average temperature from 12 to 16 gr. C.

The results of the study about average rainfalls:

For the zone taken in consideration there is a clear division north-sud for the average annual rainfalls, with a clear lower rainfall belt that extends east-west in central and south zone of the country. The majority of rainfalls occur during the cold month of the autumn and winter with round 70 % of the rainfalls that occur from October to March. The north-east zone, in Dibra and Kukes, zones where there are homogeneous climatic surfaces with the rains that go to 2295 and 3117 mm in a year, of the mountainous zones, the most northern zones of the country.

The results of the study about temperatures:

The average annual temperatures changes between 7.5 and 10.7 in the zones on hills and mountains of inner part of the country. The climatic zones with average annual temperature higher, between 14.4 and 16.3 gr. C.

In the zones of Kukes and Dibra the average annual lower temperatures are between 9.1 and 10.7 gr. C, the average maximal temperatures of them are between 13.3 and 15.6 gr. C; the minimal temperatures between 4.4 and 6.0 gr.C

All these parameters have oriented us to size up above the botanical studied regionalization of chestnut places.

The typical characteristics of the region include:

1. O extraordinary geographical and topographical difference between mountaneous regions, often with high sea level.
2. A beseasonality climate with dry and hot summer with moist, and a cold autumn and vinter; a diversity in rainfalls, and the strog winds that make possible the extensions of fires in forests.
3. A high diversity of species
4. A large history of manipulation of fruits, forests and landscape.

The territory is ecologically appropriate for the growth and development of thermophyllous oak and chestnut. Termo-pluviometric diagram based in dry index of Gausson, shown in the following diagram, demonstrates two dry summer months , no any frozen periode and two months with 100 mm rain falls.

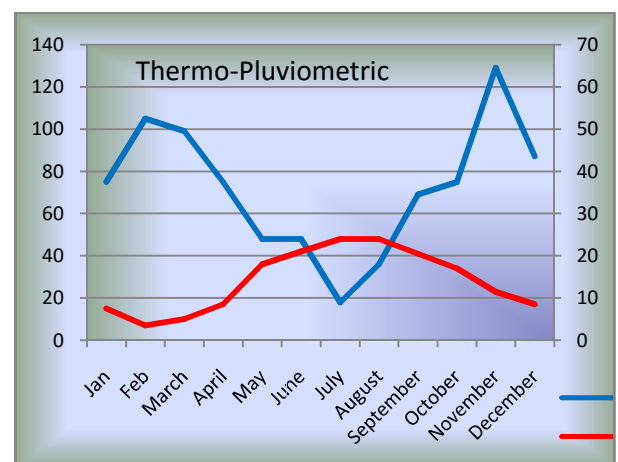


Fig.2 Gausson Index Of drought in studied region.

Appraisal of vegetative and phytosanitar situation of Kashnjeteve:

In the study zone the vegetative and phytosanitar situation of trees has been damaged progressively because of many factors. The main cause has been the extension of cancer disease of the stalk. According to the study 40 % of the trees have been infected from this disease in different levels. To fight it, all the infected twigs were pruned and, some time, have been pruned also the trunks.

In addition have been done soma improvement works, like the cutting of the dead and decayed branches, cutting of old trees with damaged crown.

But, the intent to improve the situation through the thinning, that, nevertheless have had the intention to create better conditions for increasing the productivity of plants, actually have been done to increase the development of the trees and not of the fruits quantity. Therefore the average number of trees pro hectar, is round 170, while the vegetative and phytosanitare situation are too unpleasant. The crowns are damaged by veshnulla. The chestnut forests are endangered from these diseases and main damagers.

IV. CONCLUSIONS

According to our study about the earths in the zone covered by chestnut, we have reached to the following conclusions;

The studied earths have a little bit acid reaction and average basic.

From the physical characteristic point of view, these earths are mainly of the balanced clay type (clay loam). Their root system of the plants penetrates with difficulty.

General characteristic of these earths is the low content of salts.

In general the earths have high level of KKK. The half of studied earths are of the moderate content of carbonates. Round 42 % are carbonatic and only 7 % are noncarbonatic. They have mainly average and low content of humus. Dominate the earth with content of nitrogen. They are almost balanced between the poor and the average in assimilators phosphorus.

The report Ca / Mg has a very large diapason.

Analyzing these data, concerning temperature we see that:

From the years 1980 the average temperatures have been increased.

The number of the days with a temperature over 35 gr, C is in increase. From the beginning of 1980 this happens every year and not every two or three years.

The number of days with temperature under - 5 gr.C, during the year 1980 has been in decrease. The water flows (hidrogaphi of flows) has had a decrease during the year and during every season. It is more evident during the dry months of the vinter, nevertheless the moist period of the vinter shows also u decrease.

Because the lack of data about the drought, the number and the size of the fires in forests are an approximate in-

dicator for it.

The number and the surface covered of fires, these latest 30 years, beginning from 1992 are in increase

The chestnut must be extended in a large scale in entair average mountainous zone of our country with the scope to create high forests for fruits, and, also mixed with other species for wood production.

To take into account the unsatisfactory situation of chestnut trees, the pruning and some other measures for regeneration, are of a very importance for the chestnut forests. It must be cut the dead, the decayed the infected from diseases and all the in productive branches.

In such a way the trunks can be developed healthy.

It must be cut down, flat on the ground, the remaining stumps, to stimulate in such a way the new shots. From these shots must be chosed the best 2-3 to let them to develop; the others must be cut down. The best of them will be in the future the new tree.

To protect the tree from diseases infection, all the wounds caused from pathogen agents, must be disinfected with appropriate and regenerative substances.

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