





REPORT 1.2:

ORGANIC TEA CULTIVATION IN BULGARIA

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Report 1.2: ORGANIC TEA CULTIVATION IN BULGARIA Identifying tea cultivation at partner scale

1. Background

In the 50s of the last century, Chinese tea (Thea chinensis), also known as Camellia sinensis - an evergreen plant that contains caffeine, tein, tannins, aromatic substances, anti-sclerotic flavonoids and others, is grown in Bulgaria. This is happening in Strandja Mountain, in the village of Kosti, where other alien species are grown.

The planting material was raised in 1955 from Georgian seed in a laboratory of the Institute of Biology at the Bulgarian Academy of Sciences, known at that time as the Institute of Acad. Metodiy Popov. From there the plants were transported in Tsarevo in 1946 and thence to the village of Kosti from the famous academics - professors Boris Stefanov and Doncho Kostov. The plants are planted under their leadership in the "St. Iliya" area on the territory of Forestry in the valley of the river Veleka.

These experimental plants until 1950 were grown under the guidance of Manol Stoilov, a researcher at Institute of Acad. Metodiy Popov and then until 1964 under the guidance and research of Assoc. Prof. Seraphim Serafimov. In addition to the tea plants, there were 4 tranches of citrus trees on the site. For the constant need of watering in 1954 a primitive "water pipe" was built from the nearby low-flowing river. Later this research point was handed over to the Forestry Authority, almost without adequate financial support. Due to the lack of care and mainly of irrigation, in 1983, during the visit of the Veleka 3 expedition no living plants were found. In the first 25 years, however, tea plants grow well with 3-5 consecutive growths with normal annual flowering, including in the harsh years of 1953, 1954 and 1963.

The lack of systemic care and irrigation mainly contributes to the failure of the experiment. Besides, for economically beneficial production a raw material of at least 2000 decares is needed and such large irrigated areas in Strandja and the Rhodopes Mountain were not available.







2. Mapping the existing situation in tea production:

a. Tea cultivation in country

Each year 15,000-17,000 tons of herbs and medicinal plants are collected and processed in the country, of which about 90% are exported.

These results put Bulgaria at the first place in Europe and at one of the first places in the world by quantity of the exported herbs, according to a publication on the website of the Ministry of Environment and Water in June, 2016.

Approximately 200 types of herbs and medicinal plants are collected, which are used in the pharmaceutical, cosmetic, food processing and traditional medicine industries. However, there are 20 species of active trading.

The linden, rose-hip and nettle are the most popular Bulgarian herbs abroad. The first of these is the linden blossom, from which about 1200 tons are exported annually. Exports of rose-hip berries are about 1100 tonnes per year, and about 1000 tonnes of nettles.

This natural resource is not inexhaustible, so its use is regulated by several laws. These are the Medicinal Plants Act, which lists 739 medicinal plants, the Biological Diversity Act, the Protected Areas Act, and the Forest Law.

There is currently a list of 24 herbs for which it is forbidden to be collected for commercial purposes, and for another 11 each year, the Minister of Environment and Water determines permissible quantities.

Herbs from protected species are also banned for collection from the wildlife. The aim is to stimulate their cultivated growth because it provides a high quality and large raw material without damaging the nature.

The herbs' cultiwatione provides opportunities for employment of the population in the mountain's regions where the soils are poor and the cultivation of other crops is difficult. Mint,







lemon balm, chamomile, lime, rosehip, Mursal Tea, nettle and other crops are now grown on farmland.

Areas for cultivated growth of herbs, aromatic and medicinal plants

Taking into account the soil and climatic conditions of the different regions, the traditions among the population, the market demand, the cultivation of herbs in Bulgaria can be made from the experience gained in the cooperative system. If certain species of herbs and medical plants need to be cultivated, it is necessary to study the climatic conditions and the soil composition of the plots, to take into account the availability of available labor, market demand at present and in perspective, etc. The next zoning of herbs is entirely conditional, bearing in mind the regions in Bulgaria with traditions in the cultivation of the different species. They are as follows:

Mursal Tea: Slavyanka, Pirin and Rhodope Mountains; from 1,000 to 2,200 meters above sea level. Mursal Tea is known not only in Bulgaria and in the Rhodope Mountains. Over 4000 hectares have ubiquitously distributed natural deposits on the territory of the towns of Trigrad, Smugla, Smolyan, Devin.

Rose hip: Vidin, Montana, Targovishte, Lovech, Burgas, Kyustendil, Pernik, Razgrad, Karnobat, Kardzhali, Plovdiv, Sliven, Smolyan, Vratsa, Dobrich, Stara Zagora, Shumen.

Lemon Balm: Razgrad, Varna, Burgas, Vidin, Haskovo, Targovishte, Silistra, Plovdiv, Pazardzhik, Stara Zagora, Ruse, Shumen, Yambol.

Chamonile: Pazardzhik, Plovdiv, Stara Zagora, Kardzhali.

Medical Marshmallow: Veliko Tarnovo, Targovishte, Razgrad, Shumen, Blagoevgrad, Varna, Pazardzhik, Plovdiv, Sliven, Stara Zagora.

Lavender: Targovishte, Burgas, Blagoevgrad, Montana, Plovdiv, Stara Zagora, Varna, Dobrich, Ruse, Shumen.







St John's Wort: Targovishte, Dobrich, Sliven, Razgrad, Shumen, Vratsa, Pernik, Kyustendil, Blagoevgrad.

Garden Tea: Targovishte, Stara Zagora, Razgrad, Kardzhali, Burgas, Varna, Yambol.

Thyme: Stara Zagora, Targovishte, Veliko Tarnovo.

Valerian: Stara Zagora, Plovdiv, Pazardjik, Veliko Tarnovo, Targovishte, Bourgas.

White yarrow: Targovishte, Stara Zagora, Plovdiv, Pazardzhik.

Marjoram/Oregano: Targovishte, Stara Zagora, Plovdiv, Pazardzhik.

Marigold: Targovishte, Stara Zagora, Plovdiv, Pazardzhik.

Belladonna: Blagoevgrad, Sofia, Stara Zagora, Kyustendil.

b. Tea processing

Tea production in Bulgaria is a successful model, even during a crisis. Tea production in the country is conditioned by the fact that in Bulgaria there is a culture of drinking tea, which leads to market demand for the product. The economic situation also plays a positive role. The comparatively low price (about 1 leva, equal to 0,5 EUR) and the fact that it is still a product intended for home consumption helps its demand, especially in times of crisis, when people rarely go out to restaurants. A factor in developing tea production is also the price of coffee, which is the main competitor of tea, and whose price is much higher than that of the tea.

Tea production in Bulgaria is carried out by several large producers who have branded their products on the market and have found niches for export to EU countries and beyond. Such producers are "Bulgarian Tea Company" in Sofia (<u>www.bulgarianteacompany.com/</u>), Bioprogramma EAD in the village of Dobroslavtsi to Sofia (<u>www.bioprogramme.bg</u>) and others.







Some of the big companies have closed their production cycle - from cultivating herbs on their own plots or on the basis of contracts with producers and pickers - to organizing the drying and packaging of the raw material in their production factories and the distribution of production from throughout the country.

Another part of tea production is focused on purchase of herbs from local pickers, their processing and packing on small production lines for subsequent distribution in the commercial and pharmaceutical network in the region of production. An example is Selibium-Herbals company in the village of Aksakovo, Varna District.

A small part of the tea production process, including drying and hand packaging of herbs, is organized in adopted production facilities in hereditary properties in rural and mountainous areas, and create employment for local pople in limited size. The transportation of the ready production is usually done by personal means of transport by the company's owner - a sole trader or a limited liability company.

Part of the tea production for healing purposes is organized by herbalists in the country who have several generations of experience in collecting and processing certain types of medicinal plants. They organize the sale of herbs and tea on-line or through their own stores or during health seminars and individual meetings with clients.

For all organic tea producers in the country it is common that only mechanical and physical processes with natural fermentation are used in the production. In general, the manufacturing of organic tea is carried out in a separate factory to eliminate all changes and possibilities of coming into contact with the conventional tea. The manufacture of "organic tea in conversion" and "organic tea" is done on separate days. The big company producers take care for proper cleaning and washing the factory with water under pressure before the manufacture of "organic tea" and after manufacture of "organic tea in conversion".

Organic cultivation of herbs and medicinal plants in Bulgaria

Cultivation of herbs and medicinal plants is an economically viable alternative to owners of lowproductive semi-mountainous and mountainous lands. As a rule, most herbs are unpretentious







plants, they thrive successfully on any soil, and their range is so rich that plants are grown successfully in both the most dried areas and in marshy and swampy areas. Most of the crops are perennial, which increases their profitability. It is mainly invested in their production only in the first year.

Against the background of global warming, the cultivation of drought-resistant plants such as salvia, white oregano, maize, thyme, chamomile, marigold and many others is a good opportunity for many farmers in the country.

For successful cultivation it is necessary to know well the breeding technology and especially the species and variety composition. In the assessment and selection guidelines, the problem of high content of biologically active substances is first raised, followed by the problem of resistance against diseases and pests, followed by the ability to mechanize work processes.

<u>Herbs and medicinal plants can be regionalized</u> according to their origin and requirements by grouping them in three directions:

- the Mediterranean zone / lavender, sage, thyme, anise, cumin, coriander, sage/ usually ripen early before summer heat and droughts. Their photo-periodic response as plants on a short day requires the application of low positive temperatures when germinating seeds or in a rosette phase. It is different for individual cultures by phenophase and duration.
- *temperate climate* (chamomile, geranium, peppermint, coriander, hyssop, savory, fennel) have a short vegetation period, differentiated as late fertile or biennial. Due to uncertainty in the maturation of the seeds, the species is also kept vegetative (in the mint). For normal development they require a long day, and just so they are relying on reproductive organs.
- *the tropic* (geranium, basil) have formed their biological requirements only when they are exposed to high temperatures. Moving through the development phases does not require low temperatures.

According to heat requirements, herbs grown in Bulgaria can be divided into:

- *Heat preference* anise, cumin, basil, geranium, sage, garden savory, white oregano, marigold.
- Medium heat preference- mint, lavender, rose, dill, coriander, sage, chamomile.
- *Weak heat preference –* crane's-bill, thyme.









According to light requirements:

- the major medical plants and etheric-oil crops are light-preferential. As thickening crops in perennials, they can be grown only in the first 1 to 3 years.

- Geranium and dill are *resistant to shade*, and
- *preferring the shade* is the crane's-bill.

With regard to <u>moisture and irrigation requirements</u>, herbs and medicinal plants are classified into the following groups:

- *Irrigated crops* mint, basil, savory. These crops require regular irrigation and maintenance of moisture in the root-populated soil layer. Grown without watering does not give high yields.
- Crops that stand *without watering* oil rose, white oregano, dill, sage, crane's-bill, and marigold. On this group of plants, if 2-3 floods are provided in the critical phases of their development, the yield of essential oil increases as a result of increasing the weight of the above ground mass.
- Crop-grown herbs that give normal yields *without watering* lavender, thyme, chamomile, fennel, anise, coriander.

Regarding the **Methods for the production of herbs and plants**, the following ways of propagation of the basic essential oil and medicinal plants are found **in Bulgaria**:

- *Generative seed propagation*: salvia, basil (seedlings), garden savory, chamomile, marigold, dill, white oregano (seedlings)

- *Vegetative propagation* through individual vegetative parts of the plants - root and root shoots, rooted stem cuttings: oil rose, lavender, mint, thyme, sage.

Production methods include:

<u>Agro - technique</u> - the system of events for cultivation of the given culture, part of the technology. Agro-technical measures are determined in particular by the biological requirements of the culture and by the soil climatic conditions of the selected site.

Steps and sequence of events Crops' rotation and and predecessors







The crop rotation preserves the fertility of the soil, prevents the mass attack of diseases and pests, and increases the yield of raw materials and products from the cultivated crop.

- Essential oily and medicinal crops are included in field, in-farm or in special crop rotation.
- On separate areas are grown perennial shrubs or semi-shrubs cultures that are recultivated 4-5 years and more oil rose, lavender, thyme, sage, white oregano.
- Vegetable crop rotation includes 1-3 year old plants mint, basil. They require irrigation.

- Apiaceae cultures are included in field crop rotation. Total execution of the technological operations of the machines in these crops - fennel, anise, coriander, dill, Italian cumin, ordinary cumin (kim).

Methods of production

- Soil treatment: Basic treatment - deep plowing or soil inversion.

This ensures a deeply crushed plow layer that regulates and retains moisture, reduces or eliminates weed seeds and rhizomes. It is nessessary to avoid areas of root weeds /crop rotation with grain wheat or trellis crops during the first 1-2 years/ and those with spring plowing.

- *Pre-sowing* - depending on sowing or planting time. Loosening and improving the soil layer, mechanically destroying the weeds and their weeds. If crop technology is required, pre-compaction of the soil by rolling - in shallow or surface sowing of small seeds.

Fertilization - basic / stocking / feeding during vegetation.

Manure standards are determined after agrochemical analysis of the soil - nutrient balance is achieved - the norm is determined according to the need of the plants in the defined phenophase from their development, the accumulation of nitrates and residues in soil and water is prevented, lower costs.

Authorized fertilizers and soil improvers in organic production:

- Organic fertilizers - manure, compost, bio-fertilizer.

- Other fertilizers and improvers - ground limestone, dolomite, phosphate chalk, bone meal, seaweed fertilizers (Bio foil), fertilizers with natural excrements and ingredients (Bio Nutrient, Agro Biosol, etc.)

Fertilizers and soil improvers as referred to in Article 3 (1) of Regulation (EC) No 889/2008.

ANNEX I







- A: authorized under Regulation (EEC) No 2092/91, the authorization being extended by Article 16 (3) (c) of Regulation (EC) No 834/2007.
- B: authorized under Regulation (EC) No 834/2007.

A - Authorization

Name - Compound products or products containing only the materials listed below

Description, compositional requirements, conditions of use

Manure - Product containing a mixture of animal excrements and vegetable ingredients (animal bedding)

The origin of intensive livestock farms is prohibited.

A - Dried manure and dried poultry manure

The origin of intensive livestock farms is prohibited

A - Compost of solid animal excrements, including poultry manure and composted manure

The origin of intensive livestock farms is prohibited

A - Liquid animal excrement. It is used after controlled fermentation and / or appropriate dissolution. The origin of intensive livestock farms is forbidden.

A - Peat - Limited use in horticulture (for the production of vegetables, flowers in orchards and nurseries)

A - Mushroom Compost. The initial composition is limited to the products listed in this Annex I

- A Wormwood faeces (lumbrickcomput) and insects
- A Wood sawdust and waste. Wood not treated with chemicals after felling
- A Composite tree bark. Wood not treated with chemicals after felling
- A Wood ash. From wood that has not been treated with chemicals after felling

A - Calcium carbonate (chalk, marl, ground limestone, limestone algae, (maerl), phosphate chalk)- Only of natural origin

A - Magnesium and calcium carbonate. Only from natural origin i.e. magnesium chalk, ground magnesium, limestone)

A - Magnesium sulphate (kieserite) - Only of natural origin

A - Calcium chloride solution. Foliar treatment of apples after evidence of calcium deficiency

A - Calcium sulphate (gypsum). Products defined in point 1 of Annex I D.2 to Regulation (EC) No 2003/2003 - Only of natural origin

Types of composts suitable for application in organic production







• *Organic fertilizer compost* - suitable for all crops and nursery production in a 1: 1 ratio with the ground

• *Compost of plant debris* / herbaceous stems, leaves, spoiled feed and fruit, soil or peat added and wet with water or fertilizer / - improves soil conditions.

• Nettle compost / 3: 1 scraped nettle gathered before flowering and soil. It is moistened well, and can be added to flour / - suitable for all vegetable crops.

• *Soil compost* / grass turf, marsh mud, garden soil / can be added compost of nettle and limestone. Suitable for colorful crops.

• *Peat compost* - improving the mechanical composition of the soil

• *Compost from straw or wood waste* / must add materials rich in nitrogen; e.g. for 1 kg of dry straw, 0.25 kg of dry poultry manure is needed.

Sowing, planting - seeds, planting material; norms; terms

- <u>Keeping to the terms and sowing standards</u> for each crop and they must be observed according to the growing technology, its biological requirements and the microclimate of the area.

- <u>Seeds</u> must be authentic, of guaranteed origin and quality, accompanied by relevant documents.

- Planting material - authentic, healthy, well-developed without deviations in variety.

Caring for vegetation

To provide favorable conditions for growth and plant development, the main activities are related to weed control, monitoring for the development of diseases and pests, provision of water and nutrients.

- In the early stages of its development, the greatest danger is the weeds' increase - mechanical struggle is applied - weeding, digging, burning.

- Providing watering and feeding through a specific development phase specific to each crop, conducive to development and increased yield.

- Diseases and pests - Biological struggle after establishment over threshold of economic harm.

Biological plant protection

Fighting diseases and pests









General principles

1. Principle of diversification - the human impact on agroecosystems should be directed towards their stabilization. Less concentration and specialization of production. Creation of mixed farms.

2. The application of plant protection products shall be on the principle of reasonable minimum sufficiency (only as much as is necessary and only when it is inevitable).

3. Adequacy in the plant protection system. Approaches, methods and tools that best meet the pest's biological characteristics.

Plant protection products authorized for use in organic production

Commission Regulation (EC) No 889/2008.

ANNEX I

Fertilizers and soil improvers referred to in Article 3 (1)

ANNEX II

Pesticides - plant protection products referred to in Article 5 (1)
Examples: Azadirachtin extracted from *Azadirachta indica* (Neem tree);
Pyrethrines extracted from *Chrysanthemum cinerariaefolium* - Insecticide
Other substances traditionally used in organic farming
Examples: Copper in the form of copper hydroxide, copper oxychloride, (tribasic) copper sulphate, copper oxide, copper octoate-fungicide, up to 6 kg copper / ha / year.
Sulfur - Fungicide, acaricide, repellent.

Collection of raw material

The following plant parts are harvested as raw materials from the main essential oil and medicinal crops:

Above ground mas - mint, sage, thyme, garden savory, white oregano, basil, marigold. They are picked at phase blooming and full blooming /for savory in the initial period of flowering /.

Blossoms and inflorescences - oil rose, lavender, sage, chamomile

Fruits and seeds - anise, dill, coriander and others.







c. Tea packaging and dissemination

The process of organic tea production is followed by respective ways of its storage and packing. The package and storage processes in the production of organic tea are of utmost importance. For the storage and packing there are separate stores for organic tea where no fumigation, insecticides or fungicides are used. Vacuum, steam or high pressure water cleaning is applied. Organic tea usually is packed in plywood chests or biodegradable packing materials on the same day of production and the organic quality grade is clearly indicated on each chest or container along with the invoice number of dispatch.

The packing of tea in Bulgaria takes place in different ways - manual and / or machine depending on the company size and its production capacity, the type of packaged herbs, the market share of the company, availability of credit lines and / or access to European funding programs for the purchase of machines and equipment for SMEs, including grant schemes for farmers under the Rural Development Program, and other factors. Bulk herbs are packed in the form of bags and packages of biodegradable transparent material, allowing the customer to see the color or leaves inside the packaging or envelopes with a printed photograph of the herb, contained in the bag. When placing tea in small filter bags, they are packed in a cardboard box of 20 pieces of 30 or 40 grams.



The design of packs and boxes for tea bags as a whole is made by specialized advertising studios, but much of the design ideas are made by the manufacturers themselves. The latter strive not to







save on the quality of both packaging and herbs in order to gain more competitiveness on the market.

The machines for the production and packaging of ready-made tea are also made by order. "A technology is generally built on the product - starting from inside the content, how you have prepared the raw material, pass through the size of the bag, and the size of the box," explains the entrepreneur Georgi Triov - co-owner and manager of the Bulgarian Tea Company, (www.bulgarianteacompany.com/) with many years of experience in buying, processing and marketing herbal tea. Since July 2009 in Sofia, the company has been operating the tea bag filtering factory, which has the capacity to produce 40 boxes per minute - a quantity the Triov describes as quite good for the Bulgarian market. The company has high-performance machines for cutting and de-dusting of herbs, chamomile processing line, mint and lemon processing line, line for rose hip processing; a modern equipment for production of tea in filter bags; closed cycle from raw materials to final product; Good Manufacturing Practices and HACCP.

Another big Bulgarian tea production company is Bioprogramma EAD (www.bioprogramme.bg). It was established in 1993 with the head office of Dobroslavtsi village near Sofia and warehouse bases in Plovdiv and Varna. The company produces a wide range of over 60 types of tea, which can be divided into several main groups: Herbal Mono Teas, Mixed Herbal Teas, Fruit Tea Herbal Base, Functional Teas, Mono Teas and Premium. Tea is packed in boxes of 20 and 10 filter bags. Bioprograma tea is available both in filter bags and in modern packaging with thread and outer bag - Premium series. The company also offers wooden tea boxes suitable for pubs, offices and restaurants. Bioprogram offers over 60 types of packaged herbs and mixtures in a pack of double layer paper envelopes in the pharmacy network. Thus packed herbs have greater durability and better storage.

For the packaging of tea and other products of the company (food additives of brand "Bioprogramma live", herbs and mixtures, bee honey and bee products), Bioprogramme use modern Italian and German machines to maintain a high European standard. The company has introduced monitoring and control of the production process in detail from growing and collecting the raw materials to the finished product, including through its own quality analysis laboratory for each batch.







Some of the producers of cultivated herbs for tea and medicinal purposes offer dried herbs in larger packages. For example, BILEK company (http://bilec.net/?&UILanguage=EN) of Troyan, besides filter and bulk tea, offers herbs for the production of medicines and nutritional supplements from cultivated and wild growing medicinal plants in packs of 2kg, 3kg. and 5 kg.



Some of the chains for retail and wholesale trade in the country such as METRO Cash and Carry Bulgaria offer different types of herbal tea filter packs produced under the company brand for the needs of the chain's clients. Packages are 20 or 30 grams and contain 20 pcs. filter sachets, but there is no information on the

box for the region, from which the herbs were obtained, and the name of the manufacturer.

Along with the large tea production and packaging companies in the country, there are smaller tea producers, mainly in mountainous and rural areas. Typically, when preparing and packing tea, they use manual labor from local people. Some manufacturers are focusing on packaging the herbs in bulk in transparent envelope (i.e. in cellophane) to allow the user to see the contents inside the envelope.

When packaging herbs that contain blossom, a special approach to packaging design is used, for example by printing vertical white strips at the bottom of the bag to hide from the buyer's eyes the fallen leaves and small parts of the blossom at the bottom of the package. The bags are universal sized to be used for packing different types of herbs with weight between 28, 40, 50 and 100 grams per bag, depending on the type and size of the herb in dried condition, the difficulties of collecting and processing, and other factors.









Some of tea production companies in Bulgaria like the company Botanical Ltd in Pazardzhik– (<u>https://botanical.bg/en/reshenia/private-label-program/</u>) offer to potential cliends design and packing of tea and herbs under the clients' own brand and logo in several size and types of packages. Examples of offered packages are presented in the picture below:



The company offers different types of tea bags and accessories:











During the packing, some tea producers in the country use tea-making machines, which are made in Bulgaria or imported from abroad, mainly from China.

Some of the tea packaging machines on the Bulgarian market include the following models, and are offered by the companies described below:

Company Plam Engeneering Ltd., Varna (<u>http://www.plamInj.com</u>)









Company Malakov Ltd., Plovdiv (<u>http://www.malakov.net/paketirashti_mashini.html</u>)



A wide variety of new tea packaging machines are available on-line for packing in different forms and sizes of the bags - for imports from China. Pictures of some of these machines are presented below:



There are also second-hand tea packaging machines imported from EU countries. The example of second hand tea packing machine with its technical characteristics is presented in the next picture:











Tea packing machine

Producer: CAMA Model № DXDC8IL, Serial № 0954003, 2006 Capacity: 90 packs / minute, Max. dose: 2-3 g Packaging size: 65 x 55 mm. Envelope size: 80 mm x 65 mm. Power supply: AC 380V. Power: 1.25 kW. Gross weight: 800 kg. External dimensions: 1.7 m x 0.9 m x 2.4 m. Machine size packed: 1.2 m x 0.8 m x 2 m. Source: https://www.alo.bg/1805007

The **tea dissemination and distribution** is also done in different ways. Usually, it comes through offering:

- from the warehouses of tea producers and / or traders in the country;
- store facilities in factories where the tea production is organized;
- in the retail and pharmaceutical network of major cities in the country
- via Internet in on-line shops, on the manufacturers' web pages, in business and healthy food catalogs and data bases for trade and sales.
- at international trade fairs and at food and drink fairs, organized at national level, including specialized tea and herbs' exhibitions such as FesTEAval in Sofia and "200 herbs 2 000 000 work places" in Plovdiv.
- in specialized stores for healthy food, during bazaars and in large chains with separate places for offering organic food and supplements for athletes and fitness practitioners.
- during presentations and healthy food seminars organized by herbalists and alternative medicine's practitioners
- by courier services for sending smaller shipments to end users and clients.

During organic tea distribution, the chests and packets with organic tea are transported separately with focus on not coming into contact with the conventional tea. Before shipment to destination, the organic tea is stored in an isolated places, away from the conventional tea.







3. Organic cultivation existing situation

In general, the objective of organic tea cultivation is to have an ecologically sustainable plantation, aimed at the conservation of ecology and natural habit without polluting soil, air and water and yet maintaining sustainable tea production. Tea is produced in the absence of synthesized chemicals like pesticides, fungicides, herbicides, growth regulators and concentrated fertilizers. Naturally occurring, mined products and bulky and concentrated organic manures are used for resistant cultivars, regulation of micro-climate or by the introduction of biological control agents/the use of biological products, naturally extracted without the use of inorganic solvents.

a. Selection of site

The area of selected plot for growing organic tea needs to be sufficiently isolated to ensure that there is no possibility of any pollutants or contaminants flowing or drifting into it from any known or unknown sources. There should be a buffer zone on sufficient width on all sides of the plot depending on the topography of the area, to ensure the above safety. The minimum width of buffer zone should be 100 metres. The minimum depth of soil profile should be 1.5 to 2.0 metres and organic matter status should be medium to high level depending on the elevation and rainfall of the area. A perennial source of water free from pollutants is required in the estate for large scale compost preparation, which is essential for organic tea cultivation. A detailed history of a period of about ten years, fully documented to give details of external inputs during preconversion period, should be maintained to facilitate inspection of organic tea cultivation.

b. Conversion period

The minimum conversion period should be three years from the last usage of synthetic agrochemicals. One can start marketing the tea as "in conversion organic tea" only after the lapse of one year from the start of conversion. Tea can be marketed as "organic tea" only after the completion of conversion of three years.

c. Livestock







Livestock is an integral feature of organic farming for cow dung, sheep, goat, poultry and pig manure.

d. Manual workers

Additional workers are required for organic tea cultivation in comparison to conventional tea cultivation and they are required for trenching, compost preparation, weed control, application of bulky and concentrated organic manures and shade regulation.

e. Cultural practices:

i. soil water conservation

Adoption of proper soil and water conservation measures is essential for organic tea cultivation. Trenching and mulching conserve rain water and make the moisture available to the plants on a sustained basis. Tea pruning, leaf litter and compost should be buried in trenches. Mulching can be done with Guatemala grass (Tripsacum laxum), weeping love grass (Eragrostis curvula), bracken fern, shade tree loppings and other plant materials. Guatemala grass can be planted in large vacant patches with the twin objectives of rehabilitating the soil raising mulch material.

ii. Soil reaction

Soil requires a symbiotic relationship with everything around, above, and below it, and when this relationship is harmed through chemical means, everything is altered.

Organic farming methods often involve more labor, but take far less of a toll on the environment through soil building, crop rotation, careful harvesting, assimilation of the local environment, and composting.

Soil pH should be maintained at about 5.0 by application of agricultural lime or dolomite lime once in a pruning cycle and the quantity of liming material should be determined on the basis of soil pH, rainfall and crop yield.

Manuring: Manuring ensures the availability of essential nutrients that deficient in the soil at optimum quantities and to return the nutrients removed by using the manures of organic origin demanded by the tea bushes for a sustainable productivity. Compost, oil cakes and rock phosphate are the main inputs to substitute the removal on nutrients. Nitrogen is also supplied by regular lopping of low and medium shade trees and leguminous trees (Gliricidia sepium, Gliricidia maculate) which can be grown along roadsides and other vacant patches. Bone meal, fish meal







and other manures of organic origin can also be used in available from unpolluted environment; wood ash can also be applied.

Standards for organic manure: Fertilizer Advisory Development and Information Network for Asia and Pacific (FADINAP), Bangkok has formulated the following standards for organic manure.

pH (1%): 6.5-7.5 more or less neutral; organic matter should not be less than 20.0%; Carbon:Nitrogen ratio (C:N ratio), 10:1 to 15:1; moisture content should not exceed 25.0% and free from pathogens (pathogens and heavy metals originate mainly from sewage sludge and urban garbage). The above specification are also applicable for organic manures suitable for tea plantations. In addition, electrical conductivity (EC) is also considered to judge their suitability for use in tea fields. EC (1%) up to 0.50 dSm-1recommended for young tea EC (1%) up to 1.5 dSm-1 recommended for mature tea only Minimum rate of organic manures suggested for application in tea fields is 5 t/ha and the max. rate is 20 to 25 t/ha to be applied in two equal splits.

Shade management: Adequate attention to the maintenance of optimum stand of shade should be given in organic tea cultivation and should be regulated properly by annual lopping.

Weed control: Weeds should be controlled manually by hand pulling during dry period and slashing during monsoon; uprooted and slashed weeds may be retained in the field.

Pest and disease management: Pest and disease control in organic tea cultivation is primarily preventive rather than curative. If insects and diseases occur, non-toxic biological methods are applied. Within a balanced ecological system, the pests and diseases are controlled by the use of resistant clones, balanced nutrient supply, parasites and predators, pheromones, herbal sprays and by appropriate cultural operations. Certain caterpillars like flushworm, leaf rollers and tea tortrix can be controlled to a certain extent by manually removing the infested shoots during plucking. Blister blight disease can be controlled by the use of resistant clones and by modifying the microclimate by the thinning of shade trees.

f. Trends

Bulgaria is among the first five European countries to export herbs and spices to the European Union, according to the Association of Herbalists. Bulgarians export herbs to European countries







like Poland, Hungary and Serbia. At the same time, however, in the past few years, problems have accumulated in the industry, which could lead to a collapse in production and the country to lose its competitiveness on the international markets.

In recent years the collection and export of wild herbs in Bulgaria has been decreasing. However, the country is still among the leading European countries on this benchmark. In 2018 there were exported 9,000 tonnes of wild dry herbs, and in 2017 - 12,000 tonnes. The country is extremely rich in medical plants, valued highly abroad, and it is no coincidence that last year's exports exceeded 10 million euros. Bulgarian herbs are exported to nearly 30 countries. The most sought after are nettles - roots and leaves, lime, lemon balm and hawthorn. Most of Bulgarian herbs are sold in Germany, France and Spain.



Among the herbs that are sought abroad are the rose hips, but their yield is reduced due to the cleansing of the terrains used for pastures, for which the farmers receive subsidies. Less and less people are gathering herbs. Several years ago they were more than 300,000 pickers. Now, in the active months, there are 100,000 people, mostly from regions with high unemployment such as Razgrad, Targovishte

and Shumen. Half of them are people with low education, coming from minority groups.

Mr. Ivan Tsitselkov from the Association of Herbalists says that "The main problem is the lack of pickers and organized courses on herbal medicine. After the old herbalists pass on, nobody inherited their business after them." What can be done is that the money collected from so called forest fees to be reinvested in the industry in the form of education courses. Money now sinks into the budget and no one knows what kind of funds is collected from forest fees.

The Association also calls for state support for herbs, as in Poland and Serbia for example, where there is donation for the sector. Otherwise, the country will lose more positions on international markets. Now the biggest competitors of Bulgarian exporters are companies from Romania, Turkey, Egypt and China.







In relation to the organic production of tea, the country has statistics for the areas in a control system and groups of crops grown in an organic way. Within 2017, there is a reduction in the areas under organic farming (transitional and organic areas), as well as the certified ecologically clean areas from which wild crops are harvested - mushrooms, herbs and forest fruits.

The table below shows the trends for the areas in the control system for the last two years:

Table 1. Areas in control system, ha

	2016	2017
Total areas in a control system	160 635	136 629
* Wild growing crops	307 995	272 819

**Source:* Ministry of Agriculture, Food and Forestry, according to data from the annual reports of the controllers of organic production.

Wild crops - mushrooms, herbs and berries are harvested from certified ecologically clean areas but the areas are not cultivated and are not included in the column "Total areas in a control system".

Certified ecologically clean areas from which wild fruits, herbs and mushrooms are harvested in 2017 amount to 272,819 ha, 11.4% less than in the previous year.

Areas occupied by technical crops in a control system in 2017 are 22 998 ha (including areas with oil rose, aromatic crops, medicinal plants and spices). Compared to 2016, there is a decrease of 7 514 ha or close to 25%. In the areas with aromatic crops, medicinal plants and spices, there is a decrease of 1,230 ha on an annual basis to 16,859 ha. The largest share of this group of crops occupies the areas with lavender, which amount to 4 346 ha, followed by those with coriander with 3 906 ha and fennel with 3 438 ha.

4. International market

How your country is connected commercially to the international markets: networks

Bulgaria is the largest exporter of wild herbs in Europe. Bulgarian entrepreneurs trade with over 100 different types of herbs, mainly exporting their products abroad. According to data from the









Bulgarian Association of Herbs and Mushrooms in 2018, the country exports over 10,000 tons of herbs, including the cultivated ones.

Most of the wild herbs are exported to Germany, where they are marketed on the local market as herbs, and as a final product in the form of tea or used in the food, cosmetic and pharmaceutical industries of that country. The bulk, however, is processed, packaged, transformed into a new end product and re-exported from the German side to distant markets such as the United States and Japan.

Among the most sought-after herbs abroad is linden blossom because of its strong aroma. Quality and demand determine the higher price of this herb. Among the other herbs, it is bought as the most expensive one in our country. In recent months some of the buyers have paid up to the current 5 leva (equal to about 2,5 euro) per kilogram.

Other markets for which Bulgaria exports herbs include France, Spain, Poland, Egypt, Brazil, Argentina and Japan.

With regard to official statistics, tea export and import are included in the broader "Coffee, Tea, Maté and Spices" group for statistical purposes and therefore no spesific figures can be provided for the volume of tea exports from the country, including for the volume of cultivated tea. According to data from the National Statistical Institute of Bulgaria, this group has a share of 2.3% of the total exports of agricultural goods for the year 2017. Table 2 below shows the state of import and export in the "Coffee, Tea, Maté and Spices" Group in 2017 compared to 2016:

Import a	nd export of	Sections and countries		EXPORT-FOB		IMPORT-CIF		SALDO 2016		SALDO 2017	
coffee, t	ea, maté and										
spices in 2	2016 and 2017										
2016		2017		2017/ 2016		2016		2017		2017/ 2016	
Thousa	share of the	Thousand	share of the	%	Thousand	share of the	Thousand	share of the	%	Thousand	Thousand
nd	total export	euros	total export		euros	total import	euros	total import		euros	euros
euros	of		of			of		of			
	agricultural		agricultural			agricultural		agricultural			
	goods in %		goods in %			goods in %		goods in %			
95 285	2,3	94 721	2,3	-0,6	126 361	4,4	137 905	4,4	9,1	-31 076	-43 185

 Table 2. Import and export of coffee, tea, maté and spices in 2016 and 2017

Sourse: National Statistical Institute







Despite the relatively small volume of exported goods, including tea from the above group in Table 2, the group of medicinal plants and herbs are listed as one of the export potential groups by the International Trade Center (ITC). In addition, the black and the green tea are also identified by the ITC in the Export Potential Map as export potential goods from Bulgaria to EU countries and third countries. This could be seen from the Charts 1 and Chart 2 below:



Chart 1: Export Potential – Black tea, packing < = 3kg.

Sourse: Web-site of the International Trade Center (ITC):

http://exportpotential.intracen.org/#/markets/diversification?fromMarker=i&exporter=100&whatMarker=k&what=09 0230

The markets with greatest potential for Bulgaria's exports of 090230 Black tea, packings <=3kg are France, Netherlands, the U.K., Soudi Arabia, and the United Arab Emirates. Bulgaria has closest export links with Greece. United States of America is the market with the highest demand potential for 090230 Black tea, packings <=3kg.







Chart 2: Export Potential – Green tea, packing < = 3kg.



Sourse: Web-site of the International Trade Center (ITC

http://exportpotential.intracen.org/#/markets/diversification?fromMarker=i&exporter=100&whatMarker=k&what=09 0210

The markets with the largest export potential for Bulgaria of 090210 Green tea, packaging ≤ 3 kg are France, Morocco and Belgium. Bulgaria has the closest export links with Greece. United States of America is the market with the greatest potential for 090210 Green tea demand, packaging ≤ 3 kg.







5. Research and innovation

Innovation in the use of tea for pharmaceutical purposes

Herbs and tea are one of the most widespread means of traditional medicine and raw materials for the pharmaceutical industry. They have a wide range of effects on the human body, the main being toning, treating various diseases and strengthening the immune system.

On the territory of Bulgaria grow an extremely large number of herbs that have been used for ages by the population in the form of nutritional supplements, spices, teas and medicines. According to latest Eurostat data, the country is the largest exporter of herbs across the European Union, significantly outpacing the number of other member states.

The spread of herbs in Bulgaria can be described as ubiquitous. Compared to different species, they can be found both in coastal and riparian areas, as well as in the fields, as well as in mountain regions. Some of them grow alone, others are in symbiosis with grasses, shrubs and woods.

That is why in the country since time immemorial people studying the properties of plants have used medicinal preparations of herbs and healing potions. Nowadays, traditional and scientific medicine widely use natural resources as herbs and medical plants to cure many diseases.

It is known that nutrition has a major impact on human health. This also affects the parasites. Indisposed, mixed and sweet food is an ideal place to breed parasites - from viruses to worms. Diets should contain a large number of herbs that have antiparasitic activity.

The above factors have led most of the Bulgarian tea producers to cultivate herbs organically, to be used as the a material for the production of pharmaceuticals products.

Some of them use herbs for the production of nutritional supplements, food additives and massage oils, as is the case with Bioprograma from Novi Iskar near Sofia. The company is one of the largest Bulgarian exporters of herbs as raw materials for the pharmaceutical, cosmetic and food









industries in Western Europe and the USA. The company is certified and maintains standards for the production, collection, processing and sale of cultivated and organic herbs.

Left on the picture: Part of Bioprogramme company's food suppliments under the brand Bioprogramme (https://shop.bioprogramme.bg/index.php?route=product/cat egory&path=61)

Another Bulgarian company - LTD "Ve Pe Pi – Vesko Pipev" from Velingard (http://www.tonikatea.com/en/about.html) started initially with cultivation of herbs, registered in the Bulgarian Red Book but it also orients towards the use of herbs for pharmaceutical purposes. Currently, the company has plantations in different areas of Bulgaria for herb cultivation, which are under the control and supported by professor Luba Evstatiava from the Bulgarian Academy of Science – Department of Botany. The company packing and selling Sideritis scardica (Moursalski) tea and other 12 kinds of herbal tea of high quality herbs from own production without any alloy, dye or counterfeit. The company also offer water-alcoholic extract of Poseroot Stonecrop (Golden root) under the "Tonika" brand. The company distributes its products in the pharmacy network in the country and on-line.

Roseroot Stonecrop (Rhodiola Rosea)

Ingredients: Water-alcohol extract from the plant Golden Rhodium (Rhodiola Rosea).

Purpose: Food additive contains extract of Poseroot Stonecrop-(Golden root). It increases the mental and physical performance, the coordination and the degree of the concentration, the stability of the organism at cold, heats, noise, stress, toxins, psychological and sex's disturbances. It stimulates the exchange procedures and the center high - keyed system. It betters cells to breath as well and frees the concealed interior energy to the body. High - powered antioxidant bonds the free radicals and delays the aging. It expedites reconstructive procedures after injuries and illness. It shortens the time for recuperating after arduous physical and mental overexertions, increases stability to overburdens, accelerates the retention. It makes high fixture at fast changing unfavorable impacts. It raises the night sight and shortens the time for adaptation to eyes. It is useful at high loads and diets.









Innovation in cultivation methods

Research on the benefits of tea in health

The search for gentler and softer drugs that do not have side effects and counter-reactions has determined the revival of interest in phytotherapy at the end of the 20th and early 21st centuries. In the last 10-15 years, a large part of the tea producers in Bulgaria have been focusing on the production of mixed herbal teas, intended for the preservation and restoration of health. One of the tea companies - Bulgarian Tea Company offers the series "Phytolek - Tea for Health" with special herbal combinations to support the human organism in certain conditions.

Information on the herbs used in Phytolek's health tea and its effects on the human body is shown in the following Table 2. Tea for health

ANISE (Pimpinella anisum) Expectorant, diuretic and antiseptic action. Has an antispasmodic, carminative and analgesic effect. Stimulates milk secretion in nursing mothers.
ARONIA (Aronia melanocarpa elliot) Acts as a powerful antioxidant and helps regulate weight, blood pressure and blood sugar. Has a protective effect against malignancies.
TRIBULUS TERRESTRIS (Tribulus terrestris) Has a beneficial effect on sexual problems. Increases libido and potency. Reduces cholesterol. Increases vitality.
BETULA (Betula) Diuretic, antimicrobial and eliminating smooth muscle spasms.

Table 2. Tea for health





CROSS BORDER COOPERATION





- Frankline	VALERIANACEAE
AN ANA ANA	(Valerianaceae) Normalizes nerve processes. Reduces nervous tension and
States and	related complaints. Improves the quality of sleep. Removes spasms of smooth
	muscle. Normalizes heart rhythm disturbances and reduces blood pressure.
	ERYNGO
	(Eryngium campestre) Diuretic, antispasmodic and analgesic action. Has an
	inflammatory effect on respiratory infections and removes airways spasms.
W. W.	Regulates menstrual cycle.
	GARCINIA
	(Garcinia) Suppresses appetite and prevents the conversion of unused carbs
	into fat. Has a mild laxative effect.
	HAWTHORN
	(Crataegus) Increases the strength of cardiac contractions, and decreases the
	excitability of the heart muscle. Removes the spasm of the arteries. Increases
	the strength and elasticity of vascular walls.
	GINKGO BILOBA
**	GINKGO BILOBA (Ginkgo biloba) Removes arterial spasm and venous stasis. Improves the blood
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Stimulates intestinal motility and has a laxative and cathartic effect. It has a light gallstone expelling effect.



CROSS BORDER COOPERATION





	YOHIMBINE
A Car	Increases libido and potency. Increases tumescence in the pelvis and activates
11000	the part of the spinal cord responsible for erection. Tonic and strong
	antioxidant action.
	CINNAMON
Contraction in	(Cinnamon) Stimulates the circulation of blood and nutrition of cells, and
CO SO	activates the metabolism, especially that of glucose. Improves digestion.
	KOLA NUT
	(Kola Nut) Stimulates the nervous system and improves stamina. Activates the
	metabolism and reduces an increased appetite.
	NETTLE
	(Urtica dioica) Has an inflammatory and diuretic effect. Prevents enlargement
230	of the prostate gland, typical of aging. Helps to normalize blood glucose
	metabolism. Has gallstone expelling and styptic effect. Stimulates breast milk
	secretion in nursing mothers.
Station .	CORIANDER
	(Coriandrum sativum) Stimulates gastrointestinal motility and secretion.
TEXT.	Reduces the formation of intestinal gas. Has an antispasmodic and analgesic
SHIP S	effect. Has a certain cough-out effect. Stimulates the breast milk secretion in
	nursing mothers.
and the second	CAT'S CLAW
A CARACTERS	(Uncaria tomentosa) Stimulates the immune and antioxidant defenses of the
All a grade	human body. Increases the anticancer ability of the immune system.
and the party is a	
and the	CHAMOMILE
	(Matricaria camomile) Anti-inflammatory, antiseptic, diaphoretic, analgesic
1273	and antispasmodic action. Reduces nervous tension. Facilitates expectoration
	on inflammation in the airways.











BEARBERRY

(Arctostaphylos Uva Ursi) Has a diuretic and antiseptic effect.









(Calendula officinalis) Stimulates the secretion of digestive juices and digestion. Anti-infla. (Carica papaya) Strong anti-inflammatory and antimicrobial action. (Carica papaya) Strong anti-inflammatory and antimicrobial action. (Carica papaya) Strong diurctic, anti-inflammatory and antiseptic action. Simulates metabolism and improves the clasticity of blood vessels. (Pu-erh tea) Activates digestion and metabolism. Helps reducing blood cholesterol and removing the excess weight. Has an antioxidant effect and slows the aging process. Anti-inflammatory and antiseptic action. Improves the cardio-vascular and circulatory system activity. FENNEL (Foeniculum vulgare) Improves digestion and reduces the formation of gas in the gastrointestinal system. Stimulates breast milk secretion in nursing mothers. Antispamodic and diurctic action. OREGANO / MARJORAM (Origanum vulgare L.) Expectorant, antiseptic and spasms eliminating action. Stimulates the secretion of sweat, digestive and bronchial glands. Activates intestinal motility, reduces nervous tension and relieves related symptoms. ROSE (Rosaceae) Activates intestinal peristalsis. Stimulates the production and secretion of bile juices. Helps you lower your blood cholesterol levels. Antiseptic action. StlvIVIA (Salvia) Antiseptic and anti-inflammatory action. Normalizes the increased secretion of salivary and sweat glands. Reduces the formation of gas in the gastrointestinal system.		MARIGOLD
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	SAW PALMETTO (Saw Palmetto) Restores the imbalance of dihydrotestosterone / testosterone in favor of the latter and thus prevents the growth of prostate cancer and
	normalizes urination. Favorably affects the prostate gland function.
	CASSIA (Cassia senna L.) Stimulates intestinal peristalsis.
	LIQUORICE (Glycyrrhiza glabra L.) Anti-inflammatory and expectorant action. Has antispasmodic and epithelium tonic effect.
	STEVA (Stevia Rebaudiana) Improves digestion and blood glucose metabolism. Has supportive and restorative effect. Stimulates mental and physical performance.
	HIBISCUS (Hibiscus) Immunostimulatory and antioxidant action. Increases vitality. Improves the elasticity of blood vessels. Activates digestion and improves metabolism in the body.
Je-	CHICORY (Cicorium intybus) Antimicrobial action. Stimulates the production and secretion of bile juices and improves digestion. Normalizes high blood sugar

CRANBERRY

(Vaccinium vitis-idaea L.) Strong antimicrobial action, particularly against bacteria causing infections in the urinary system. A powerful antioxidant. Improves metabolism in the body and normalizes high blood cholesterol levels. Prevents dental plaque formation.









SLIPPERY ELM

Expectorant, diuretic and antioxidant action. Improves digestion. Soothes inflammation and irritation along the gastrointestinal system. Reduces irritation in the airways, which is a symptom of some respiratory infections



BLACK ELDER

(Sambucus nigra) Antiseptic and cough-out action. Helps normalize high temperature. Has diuretic effect.



ROSE HIP

(Rosa canina) Anti-inflammatory and diuretic action. Improves digestion and metabolism in the human body. Increases the strength and elasticity of the vascular walls. Increases stamina and immunity.

Photo credit: Bulgarian Tea Company









- 6. Sources of information
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 Serafim Serafimov, Magazine AgroLife (04.05.2016г.) - <u>https://agrolife.bg</u>

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