

THE CULTIVATION OF SPICES IN GREENHOUSES AND THEIR EXPORT

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Abstract

The study of aromatic and medicinal plants represents great economic and practical interest. Therefore, it is the subject of study by many authors with agronomic, technological, biological, botanical, chemical and biochemical, medical, and pharmaceutical specializations. Many of these plants have been included in national, regional, and wider projects. A special subgroup of Aromatic and Medicinal Plants is the plants used for spices. In our country, spices are widespread and widely used in cooking and in flavoring many foods, beverages, and environments. Edible spices are an important part of Aromatic and Medicinal Plants.

In recent years, they constitute a plant subgroup that is taking on other characteristics, dimensions, and greater importance. A completely special case is the export of fresh spices. This is the reason why the study of fresh spice plants was undertaken and studied in one of the typical companies cultivating fresh spices.

The company "ELITE.A.E." in Tirana, near Rinas airport, has been working for over thirty years, cultivating and exporting fresh spices to several European countries. The export of spices is an opportunity for the presentation of Albanian products in Europe and a source of income from exports. This company exports fresh spices to several countries: Switzerland, Canada, Germany, Austria, and Croatia. The herbs that are exported are: Mint, Basil, Sage, Rosemary, Dill, Parsley, and Coriander.

Keywords: Spices, herbs, sage, rosemary, dill, parsley, basil.

1. Introduction

Cultivation of spices in greenhouses is a new field with economic benefits and many interests for the future. Since 1992, the cultivation of spices in greenhouses has begun by several farmers and small companies. For thirty-two years, the most successful is the Company: "ELITE. A. E". The work began with existing greenhouses and now with new greenhouses, built and organized near Rinas airport. So far, fresh herbs such as Mint, Rosemary, Basil, Coriander, and Thyme have been exported. Also, for the domestic market, Dill, parsley, and aromatic onions (green) have been cultivated; these herbs have been exported from time to time according to the demands of the foreign market.

2. Scientific methodology

The aim: To study the cultivation of fresh spices in protected environments, their processing and export.

Objectives: 1. To study the cultivation of fresh spices in protected environments
2. To study the processing and preservation of fresh spices.
3. To study the preparation and export of fresh spices.

Presentation of a brief history of the Company "ELITE. A. E." The progress of the area of cultivation of spice plants and their production based on the Company's data. Certification of the Company for "BIO" products by Institutions of other European countries with which it cooperates and exports, mainly Switzerland. Description of the cultivation technology of the

five most important plants cultivated by the company "ELITE. A. E.", specifically: Basil, Dill, Coriander, Rosemary, and Mint. Oregano, thyme, sage, etc., also play an important role.

To present the harvest and storage in the refrigerator room. To present the preparation of fresh spices for export at the work table, with the main technical measures.

To present the refrigerated room and its dimensions, as well as the temperature regime of production storage. The size of the bundle and the method of packaging, the dimensions of the packaging crates, the bags, and the weight of the packaging must be presented. To present the export chart (the most common one that occurs).

At the end, the conclusions drawn and the possible advices are given.

3. Results and their interpretation

3.1. History of the company: The company "ELITE.A.E." started its work in 1994 by renting glass greenhouses in the former sector of the "17 Nëntori" farm, Picar, Tirana, which were privatized by the residents and workers of the area. The work began for the domestic market and later moved to the export of fresh spices. Initially, it started with one plant, basil, and continued with arugula, mint, and today there are twenty-seven plants. The main herbs that the company has worked with the most are: basil, dill, coriander, rosemary and mint. Alongside these plants, parsley, arugula, calamondin, etc. are cultivated. Today, 27 (twenty-seven) plants are cultivated. The main characteristics and cultivation technology are presented below. The company has been certified for "BIO" products since 1999 by the Swiss Biological Institute: "BIOSWISSE" and by "GLOBAL GAP" CERES 2018, Germany. Fresh spices are traded in the Albanian market and for export, initially to Switzerland, Germany, Denmark, Slovenia and later to Canada. The company, with its experience, has ensured credibility in the market. Exports have been constantly increasing. Quality and correctness have ensured continuous progress without interruptions or crises.

3.2 Area trend and production harvest

Table No.1 Trends in the area (ha) planted with fresh spices

No.	Years	Herbs				
		Menta	Basil	Coriander	Dill	Rosemary
1	1994	0.1	-----	-----	-----	-----
2	1995	0.1	-----	-----	-----	-----
3	1996	0.2	-----	-----	-----	-----
4	1997	0.2	-----	-----	-----	-----
5	1998	0.35	-----	-----	-----	-----
6	1999	0.35	0.1	0.5	-----	-----
7	2000	0.35	0.1	0.5	-----	-----
8	2001	0.5	0.3	0.5	-----	-----
9	2002	0.5	0.3	0.5	-----	0.1
10	2003	0.5	0.3	0.5	-----	0.1
11	2004	0.5	0.3	0.5	-----	0.1
12	2005	0.5	0.5	0.8	-----	0.1
13	2006	0.8	0.5	0.8	0.2	0.1
14	2007	0.8	0.5	0.8	0.2	0.1
15	2008	1.1	0.5	0.8	0.2	0.1
16	2009	1.1	0.5	0.8	0.2	0.2
17	2010	1.1	0.5	0.8	0.3	0.2
18	2011	1.3	0.5	0.8	0.3	0.3
19	2012	1.3	0.5	1.5	0.3	0.3
20	2013	1.3	0.9	1.5	0.5	0.5
21	2014	1.32	0.9	1.5	0.4	0.5

22	2015	1.5	0.9	1.5	0.6	0.5
23	2016	1.5	0.9	1.5	0.5	0.4
24	2017	1.5	1.5	1.5	0.5	0.4
25	2018	1.9	1.5	1.75	0.4	0.4
26	2019	1.9	1.5	1.7	0.4	0.4
27	2020	2.2	1.5	1.7	0.4	0.6
28	2021	2.3	1.6	1.8	0.6	0.8
29	2022	2.4	1.8	1.9	0.7	0.9
30	2023	2.1	2.2	1.7	0.8	0.78

As can be seen from the table, the area planted with spices has been steadily increasing. In recent years, it has stabilized at an area of 6.2-6.5 ha. The production is harvested by plucking young shoots with 7-10 leaves in mint, 15-20 leaves in rosemary, before flowering in dill. Harvesting is done early in the morning, at 5-8.

3.3 Export performance

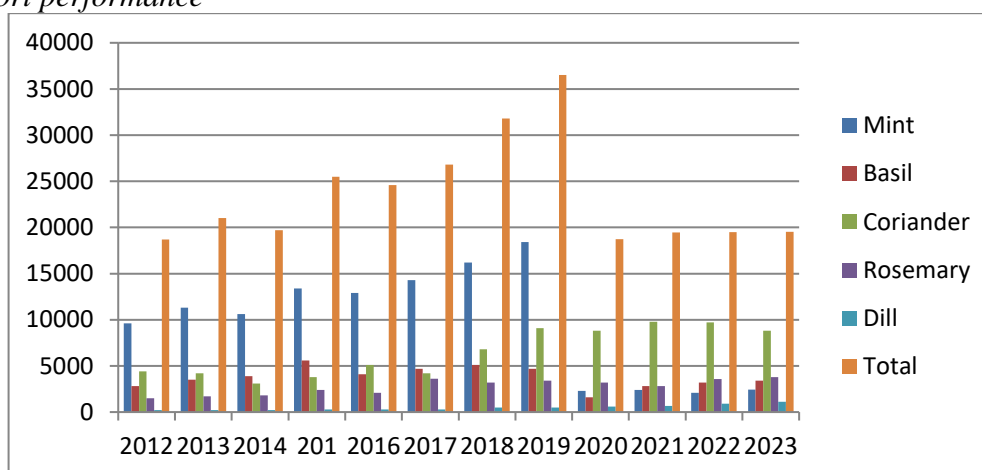


Chart No. 1 Export performance over the years by plant and total

Exports have been increasing steadily. In eight years, exports have doubled for these five plants alone. Over 50% of exports are mint plants, 18,400 kg out of a total of 36,500 kg.

3.4 Preparation of production for export: After harvesting, the produce undergoes careful processing for export. The production of spices becomes standard, uniform and clean from weeds and other insect residues. All processing processes are carried out in the processing room on a clean table equipped with electronic scales.

3.5 Post-harvest production processing: Immediately after harvesting, the produce is placed in a refrigerated room measuring 8 x 4 x 2.5 m and with a volume of 80 m³. There it is kept fresh at a temperature of 5 -8 °C. The bags of produce are harvested in a single row close to each other. They are taken out piece by piece from two to three bags and placed on the work table spread out in a layer of 10 to 15 cm. There, the bunches are cleaned and formed and weighed on an electronic scale. The bunches weigh 80 g. They are tied with a not very strong rubber band and the tails are cut to a length of 5 - 7 cm and the average daily quantity exported is according to Table 1.

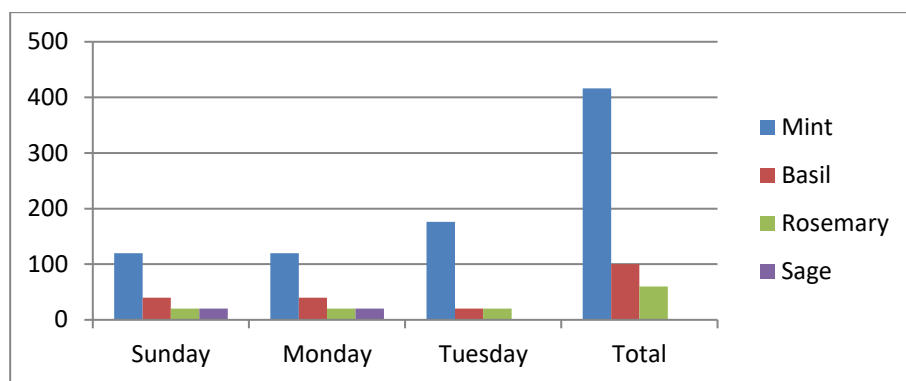


Chart No. 2 Daily export quantity by plant

3.6 Packaging of the production: The bunches are placed in cardboard boxes with the following dimensions: 50 x 30 x 40 cm, with a volume of 0.06 m³ and a carrying capacity of four kg, so two bags of two kg each are placed in the box. The production labels are placed where it is written: The name of the plant, the phytosanitary purity, the weight of each bag and the weight of the box, the date of harvest and processing.

3.7



Photo No. 1 Packaging of production for export

3.7 Storage of production in the refrigerated room: Cardboard boxes filled with spice production are placed in the refrigerated room and stored there until the moment of departure for the airport. They leave for the airport 30-45 minutes before the plane's departure. On the plane, they are placed back in refrigerated rooms at the same temperatures (5 -8 °C). Even after the plane arrives, transportation from the airport to the user is done by refrigerated transport. This way, the produce is kept fresh and its original values are preserved.

4. Conclusions and recommendations

From a general study (cultivation of spice plants in greenhouses, harvesting of production, processing and packaging of production) we are able to draw several conclusions and provide advice, among which we can mention:

A. Conclusions

1. Cultivation of spice plants is very successful in greenhouses.
2. The natural conditions are very suitable for producing fresh, high-quality spices with a high content of essence.
3. Plants can be planted at any time, eliminating the seasonal nature of their production. It is the full sun exposure that allows for year-round cultivation of annual plants, such as basil, dill, and coriander. While perennial plants, such as mint and rosemary, continue to produce all year round.

4. The proximity to the airport has solved many technical problems of preserving the freshness of spices. Therefore, moving the cultivation from Picari to the vicinity of Rinas has greatly improved the quality of work.

B. Conclusions

By treating the cultivation, harvesting, processing, and export of spices in a complex way, we advise: To cultivate these and other spice plants as an opportunity for the development of organic agriculture in order to present ourselves abroad with the possible Albanian brand. Spices are very economically profitable, taking as a basis that one kg of spice costs 8 (eight) euros.

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