

# HIPPOPHAE HELLAS



# SEABUCKTHORN CULTIVATION IN GREECE



## ● Cultivation Area

- ✓ 160 hectares
- ✓ 95 farmers
- ✓ Start of planting December 2012 with one year plants
- ✓ Across Greece, mainly in the regions of Thessaly & Macedonia
- ✓ Elevation 100-1200 m
- ✓ Distance 1,5-2 m X 3,5-4 m

## ● Climate - Soil

- ✓ Soil : Sandy Loam , Loam , Sandy clay loam, Clay Loam, Silt Loam
- ✓ Temperatures: summer + 45 C winter -20 C
- ✓ Yearly raining: Thessaly 400-600 mm , Macedonia 800-1200 mm

## ■ Varieties M.A. LISAVENKO

- ✓ Chuiskaya, Essel, Klavdia, Altaiskaya, Augustina, Afina, Chechek, Etna



# BIOLOGICAL CYCLE OF THE PLANT



- Blossom  
March
- Growth  
March – June
- Harvesting of the Berries  
June-July
- Temperature stress – Slow growth  
August
- Growth  
September – November
- Hibernation  
December - February



# CULTIVATION



- **Irrigation**

At least 400 m<sup>3</sup>

- **Weeds control**

Mechanical control

- **Pruning**

Formative pruning 1-3 years – Fruit pruning for years old and above

- **Fertilization**

Mainly P, K and trace elements throughout the cultivation illnesses

- **Diseases**

Verticilium, Fusarium, Rhizoctonia

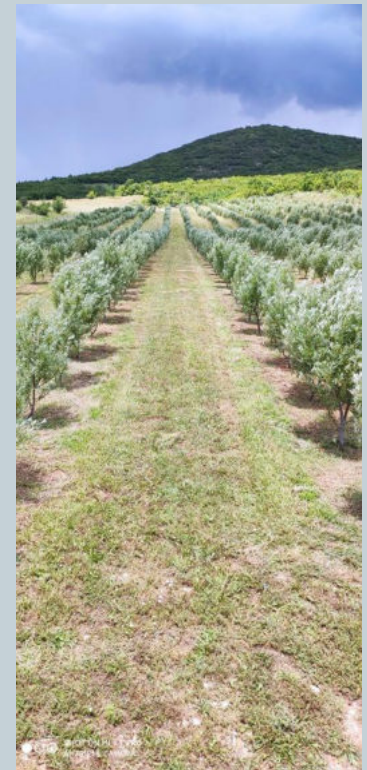
Loss of first years 2012-2016 average 30%

Loss of last years 2017- now average 10%

- **Enemies**

Birds, grasshoppers, aphids, *Protaetia cuprea*

Control with nets and organic insecticides







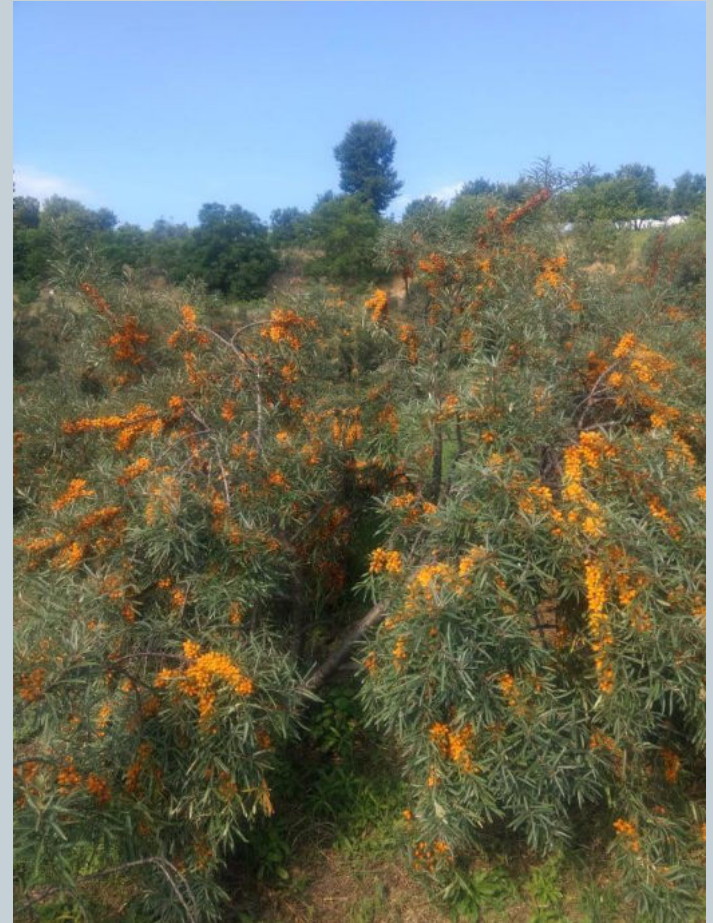




# Productivity



- 0,5-1 kgr per tree 3 years old
- 3-4 kgr per tree 4 years old
- 8-12 kgr per tree 5 years old
- 15-22 kgr per tree 6 years old









Quality Characteristics	
Variety	Chuiskaya, Klavdia, Essel, Altaiskaya, Checchek, Athena, Augoustina
Size average	1,5 cm – 1g
Brix average	14
Acidity average	1,3
Oil % average	5
Flesh – Kernel %	96 - 4
Certification	GRASP - GLOBAL G.A.P. & Organic
Active Ingredient	Flavonoids, Omega (3-6-7-9) Vitamin E,C,D,E,K,B(1,2,6,9,12), Trace elements K,P, Ca, Mg, Fe, Se, Various amino acids, Carotenoids and other.
Productivity	15 tones per hectare



1. Fruit Quality at commercial harvest of various cultivars and farms in June 2018. Skin color parameters measured with Minolta chromameter, SSC soluble solids content. For every parameter (in each column) means followed by different letter differ significantly (5% error).
2. Fruit Quality at commercial harvest of various cultivars and farms in June 2016 , 7 days before harvesting.

Variety	Fruit mass (g)	Skin L*	Skin C*	Skin Hue	SSC (%)	Acidity (%)	SSC/ Acidity	Fruit Dry matter (%)
Augustine	1,29 a	51,3 cd	63 ab	74 a	10,9 bc	1,94 b	5,61 d	19,7 e
Essel	1,04 b	50,5 ed	64 a	69 c	9,4 e	1,73 d	5,42 de	17,6 f
Klavdia	0,77 de	51,2 cd	61 b	69 c	10,5 bc	1,40 g	7,54 b	22,7 d
Checkek	0,90 c	46,7 f	57 c	62 d	9,9 d	1,52 e	6,50 c	20,8 e
Tsuiskaya	0,80 d	54,4 b	65 a	70 b	11,5 a	1,35 h	8,53 a	23,9 c

Variety	BRIX	ACIDITY(%)	WEIGHT 100 Berries	SIZE cm	PHENOLIC	Antioxidants Mmol/gr
Chuiskaya	11,07	1,69	78,67	>1,2	151	1,7
Essel	13,80	1,89	97,84	>1,4	143	1,6
Altaiskaya	14,21	1,95	70,44	>1,0	276	4,7
Chechek	12,00	1,89	72,05	>1,0	203	2,4



## HIPPOPHAE HELLAS PRODUCTS

Type	<b>Concentrated aseptic 40 Brix sea buckthorn juice with the oil</b>
Variety	Chuiskaya, Klavdia, Essel, Altaiskaya, Chechek
Certification of fruits	Global G.A.P.
Product Type	Juice with the oil
Place of Origin	Greece
Processing Type	Direct press, pasteurization
Purity (%)	100%
Appearance	Orange color juice, with a characteristic smell and taste
Brix	40
Acidity	4,12
Ph	3,58
Active Ingredient	Flavonoids, Omega (3-6-7-9) Vitamin E,C,D,E,K,B(1,2,6,9,12), Trace elements K, P, Ca, Mg, Fe, Se, Various amino acids, Carotenoids and other.
Application:	Use in the food industry Medicinal use and manufacture of cosmetics
Pesticides	ND
GMO	Free
Preservative	No
Shelf Life	1 year (for unopened packaging and in temperature from 0 to + 20 ° C
Packaging	Barrel
Weight (kg)	220





# HIPPOPHAE HELLAS PRODUCTS



# Research

In collaboration with the Agricultural University of Thessaly, M.A.LISAVENKO of Russia and other collaborating institutions have been carried out, are in progress and are planned research projects concerning the following fields:

- Increase – development and physiology of our cultivated varieties in Greek soil and climate conditions.
- Techniques– cultivation methods irrigation, fertilization, plant protection, weedicide, enemy control using the intelligent agriculture from planting to collection.
- Complete mechanization of cultivation from planting to collection
- Processing- development of innovative techniques and products of high added value.

The research carried out aims to acquire know-how related to productivity, quality improvement, reduction of production costs combined with environmental friendliness.



**Nutrient inputs – outputs, Klavdia 2020** (plants 4 years old, well managed – irrigated and fertilized with soil and foliar fertilizers)

Inputs with one application of 0-52-34, two complete fertilizers (20-20-20) through fertigation, and two foliar biostimulants/micronutrients the farmer added:

5 kg N, 20 kg P<sub>2</sub>O<sub>5</sub>, 15 kg K<sub>2</sub>O per hectare (ha). Actually added: **5 kg N, 8.74 kg P, 12.4 kg K.**

**Yield:** reached 7.2 kg per tree, and with 1130 alive trees per ha, total fruit production was 8130 kg/ha. Fruit were sent for macronutrient analysis.

Nutrient outputs and inputs:

Nutrient	Fruit content (mg/kg)	Outputs (kg/ha)	Inputs (kg/ha)
N	2521	20.5	5.0
P	178	1.45	8.74
K	1184	9.6	12.4
Ca	80	0.65	
Mg	66	0.54	





# Scientific Support

- ♦ Supply of certified M.A. LISAVENKO varieties.
- ♦ Design of the orchard
  - ✓ *planting distances, pollinator arrangement, irrigation system, fertilization, plant protection, soil preparation.*
- ♦ Installation of the orchard under the supervision of specialized agronomists.
- ♦ In the field of care
  - ✓ *plant protection, fertilization, weed control, irrigation, pruning.*
- ♦ In the harvest of the fruit.
- ♦ In post-harvest fruit management



## Scientific Support

# CULTIVATION METHODOLOGY

- ♦ Field suitability check
  - ✓ *Climate, altitude, soil composition, possibility of irrigation etc.*
- ♦ Variety selection based on the field data.
- ♦ Irrigation system design and planting layout.
- ♦ Soil preparation.
  - ✓ *Processing, fertilization, improvement, drainage, etc.*
- ♦ Supervision of works
- ♦ General cultivation guide - cultivator training
- ♦ Specialized support in each cultivation



Support is provided by the specialized scientists of the agronomic department of Hippophae Hellas with visits and step by step advice on cultivation in collaboration with the School of Agricultural Sciences of the University of Thessaly and M.A. LISAVENKO Institute, by providing a detailed cultivation manual to the farmers.

# CONCLUSION



- Excellent adaptation in Greek climate
- Early harvesting June - July
- Productivity and quality according varieties characteristics
- Continuous research for the improvement of cultivation techniques
- Collaborations
  - M.A. LISAVENKO - YURY ZUBAREV
  - University of Thessaly



# HIPPOPHAE HELLAS



THANK YOU!

