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# Presentation of the crop models developed in Georgia

## Dobrich, Bulgaria
## 30 May, 2022

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1. CROP MODELLING FOR SYNTROPIC FARMING

2. ORGANIC WHEAT GROWING MODEL

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# 1. CROP MODELLING FOR SYNTROPIC FARMING – Choice of crop& Model

- The effects of climate change highly challenge the productivity of the agricultural sector. In this respect the stallholders are the most affected.
- Syntropic farming is a model that enables farmers to withstand climate change impacts and produce more for own food security and additional income
- The Syntropic farming is a type of regenerative agriculture developed by Ernst Götsch (Switzerland) in Brazil. This is an agroforestry approach designed to mimic a forest

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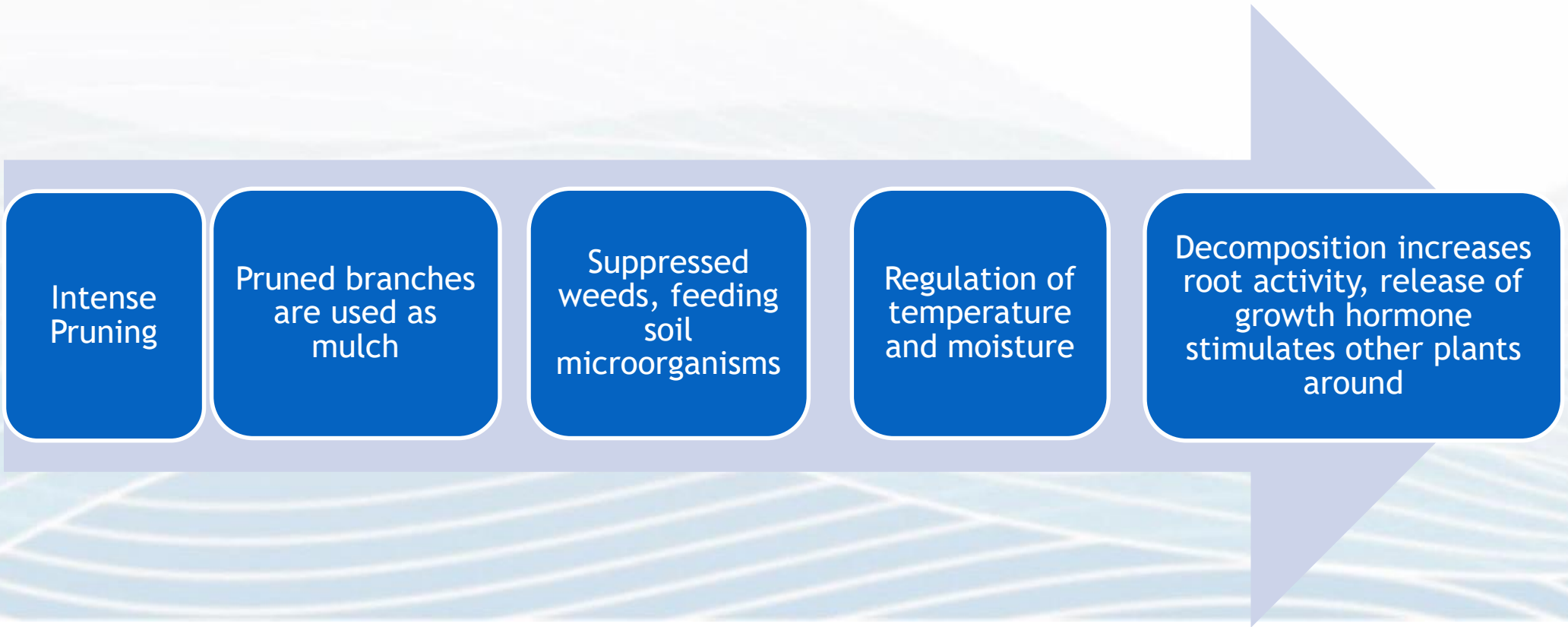
# 1. CROP MODELLING FOR SYNTROPIC FARMING – Choice of crop& Model



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# 1. CROP MODELLING FOR SYNTROPIC FARMING – Choice of crop& Model

**The syntropic farming:**

- ❑ **gives possibility to produce food and/or cash crops on the same area - uses land efficiently**
- ❑ **helps to rehabilitate and regenerate the land - soil becomes healthier,**
- ❑ **supports ecosystem regeneration and low dependency on external inputs (including irrigation),**
- ❑ **increases financial returns,**
- ❑ **Is good for carbon sequestration, diverse farming**

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# 1. CROP MODELLING FOR SYNTROPIC FARMING – Choice of crop& Model

- The main objective: to introduce syntropic farming model to farmers in Samtskhe-Javakheti and select best staple plants to cultivate in fruit orchards in the region
- Model is implemented on Elkana conservation farm “Seed Ark” located in village Tsnisi, Samtskhe-Javakheti
- An area of 0.5 ha (5,000 sq.m), planted with indigenous varieties of apples is used; length of the plot - 200 meters, width - 25 meters.

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# 1. CROP MODELLING FOR SYNTROPIC FARMING – Choice of crop& Model

- Five rows of 15-year-old indigenous apple (different varieties) orchard are used;
- There are 40 trees in each row (200 trees in total);
- Distance between trees in rows: 5 meters;
- Distance between rows of trees: 6 meters; under the shade of trees - 2 + 2 meters;
- the width of the area to be used for growing staple plants - 2 meters - the area to be used for growing staple plants: 1,600 sq.m

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# 1. CROP MODELLING FOR SYNTROPIC FARMING – Choice of crop& Model

**Staple plants selected:**

- **vegetables - various salads, mangold, cucumber, mint, horseradish, sorrel, coriander, parsley, basil – in 2 rows (800 sq.m)**
- **millet – in one row (400 sq.m)**
- **flax, cow pea, chick pea - in one row (400 sq.m)**

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# 1. CROP MODELLING FOR SYNTROPIC FARMING

## Model Area (January)

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# 1. CROP MODELLING FOR SYNTROPIC FARMING

## Ploughing and farrowing (March)

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# 1. CROP MODELLING FOR SYNTROPIC FARMING

## Preparation of mulching (April)

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# 1. CROP MODELLING FOR SYNTROPIC FARMING

## Preparation for sowing and sowing (end of April)

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# 1. CROP MODELLING FOR SYNTROPIC FARMING

## Watering / Developing of sowings (May)

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# 2. ORGANIC WHEAT GROWING MODEL – choice of crop & method

- The effects of climate change - global warming, intense periods of heavy rain and longer dry periods, highly challenge the productivity of the agricultural sector.
- Farmers around the world experience frequent loses due to altered meteorological conditions, floods, droughts, as well as weed & pests' outbreaks brought about by the climate change.
- Farmers need to choose crop varieties well adapted to local conditions and resistant to drastic environmental changes.

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# 2. ORGANIC WHEAT GROWING MODEL – choice of crop & method

- Organic production system in combination with use of heritage wheat species can be a solution for stable harvests and food security for smallholder farmers from dry areas affected by the climate change.
- The model proposes use of cover crop - an ancient well-known method, in order to suppress weeds, reduce water consumption and increase soil nitrogen

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## 2. ORGANIC WHEAT GROWING MODEL – choice of crop & method

**The Benefits of cover crop use are the following:**

- ❑ **weed control without using herbicides;**
- ❑ **no need to use nitrogen fertilizers - rhizobium bacteria inhabiting clover root nodules will enrich the soil with nitrogen, increasing thus the yield and quality of grain;**
- ❑ **the soil protected from erosion;**
- ❑ **the soil looseness maintained;**
- ❑ **the content of organic matter in it and the ability to retain moisture increased (the frequency of watering and water consumption reduced);**
- ❑ **it is possible to use clover hay for animal feed.**

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# 2. ORGANIC WHEAT GROWING MODEL – choice of crop & method

- The main objective of the experiment is to introduce heritage wheat and the organic wheat growing model to farmers in Samtskhe-Javakheti.
- The model implemented on Elkana conservation farm “Seed Ark” located in village Tsnisi, Akhaltsikhe municipality, Samtskhe-Javakheti region.
- 0.25 ha (2,500 sq.m), sown on October 29, 2021 with the autumn wheat variety "Akhaltsikis Tsiteli Doli";
- one hectare (10,000 sq. m) sown with the endemic species of spring wheat - Dika, in March, 2022.

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# 2. ORGANIC WHEAT GROWING MODEL

**Taiul Berishvili, Nagel Maxted, Elkana staff at Seed Ark Farm, Tsnisi**

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# 2. ORGANIC WHEAT GROWING MODEL

Selected crops:

- ❑ Clover as a cover crop

- ❑ Heritage wheat:
  - the aboriginal variety of autumn soft wheat - "Akhaltsikis Tsiteli (red) Doli“
  - endemic species of spring wheat - "Dika"

These wheat species are known for:

- ❑ nutritive qualities;
- ❑ highly adaptability to local soils and changing weather conditions;
- ❑ resistance to pests & disease;
- ❑ stable harvests in low input systems (food security for smallholders)

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# 2. ORGANIC WHEAT GROWING MODEL

**Tsiteli Doli, *Triticum aestivum* L. / Dika, *Triticum carthlicum* Nevski**

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# 2. ORGANIC WHEAT GROWING MODEL

## Tsiteli Doli Wheat, *Triticum aestivum* L.

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# 2. ORGANIC WHEAT GROWING MODEL

## April 12, 2022 Tsiteli doli field / sowing of clover

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# 2. ORGANIC WHEAT GROWING MODEL

## May 27, 2022 Tsiteli doli field / clover under the wheat

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# 2. ORGANIC WHEAT GROWING MODEL

## Dika Wheat, *Triticum aestivum* L.

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# 2. ORGANIC WHEAT GROWING MODEL

## April 21, 2022 Dika doli field / sowing of clover

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# 2. ORGANIC WHEAT GROWING MODEL

**May 27, 2022 Dika field / clover under the wheat**

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# Thank you for listening!

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