GREENHOUSE COMPLEX

Bihor County, Ciocaia

SHORT PRESENTATION AND

DESCRIPTION OF THE

GREENHOUSE COMPLEX

GREENHOUSE COMPLEX
IN ROMANIA,

BIHOR COUNTY,

CIOCAIA VILLAGE

1. Area and the site

The greenhouse complex is composed by 9 similar greenhouses as dimensions and technical specifications. Each of them are fenced and can operate individually or as a complex, being equipped with separate power source, heating and irrigation systems, drilled water and controllers. The construction was finalized in 2014 and are ready to use.

The new greenhouses are registered as operators in organic agriculture, are certified by AUSTRIA BIO GARANTIE SRL - accredited inspection and certification body.

They are Located in the Northwest region, respectively Sacuieni outside city limits, near the village Ciocaia, about 40 km from Oradea (N 47° 21′, 22°, 6′/ E 47,35°, 22,2′). Location is bounded in the north-east of a drainage channel which discharge water into the river Jer and in the the vest by village road.
The predominant geological structure is old Quaternary alluvium and loess.

Overall climate is characterized by a moderate continental climate.

2. General specifications

9 units each covering an area of 8.200 m2

Total area of the greenhouses: 73.800 m2

Total area of the site: 126.700 m2

2.1. SPECIFICATION OF GREENHOUSES

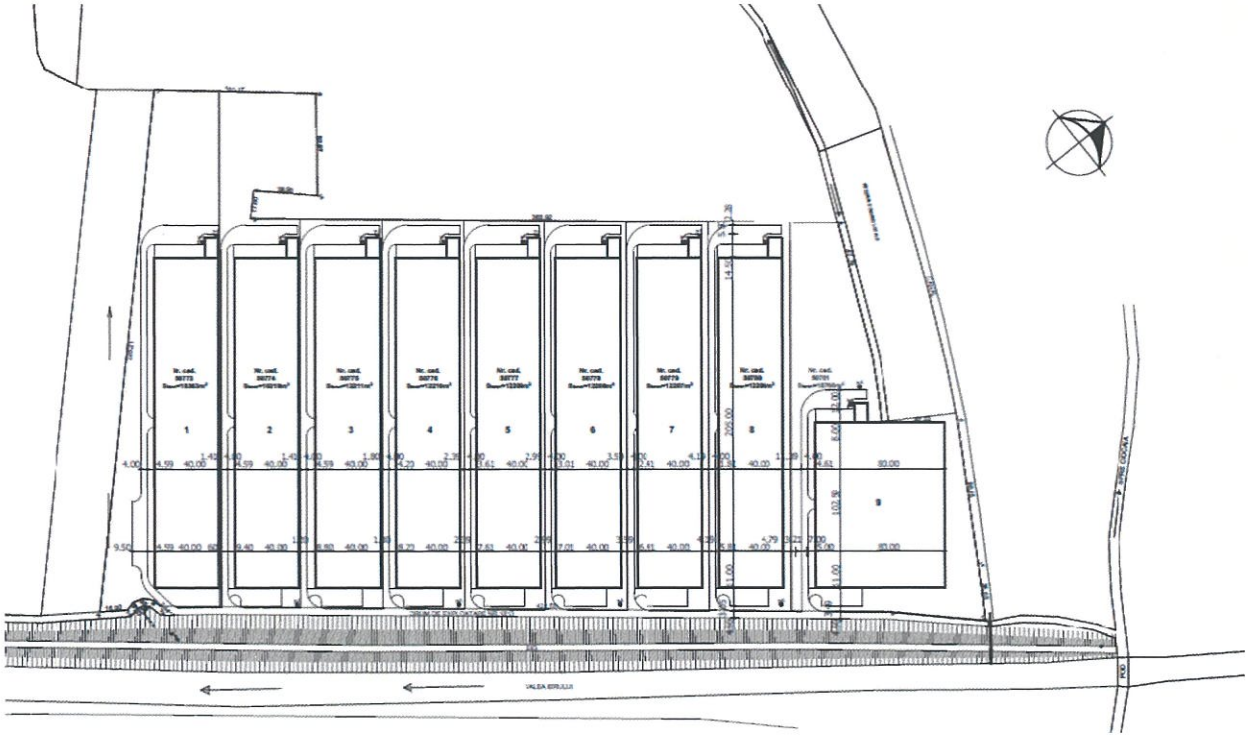
Type of greenhouses : foil covered galvanized steel structure
Crop: Vegetables, flowers
Minimum temperature -25 ºC
Minimum average temperature -1 ºC/-2 ºC
Maximum temperature +40 ºC
Maximum average temperature +16 ºC/+18 ºC
Average yearly rain 600-700 mm
Ventilation on roof
Ventilation on walls Yes. On gutter walls.
Covering Roof: Double plastic film
Gutter walls: Double plastic film, Polycarbonate doors
Gable fronts: Double plastic film, Sandwich panels, Polycarbonate doors
Inflating system
Climate controller
Irrigation system
Heating system
Stores
Electrical installation

2.2. DIMENSIONS

Greenhouse Type 1
Number of spans : 5 units
Width of each span : 8 m
Total width : 40 m
Length of spans : 205 m
Height to gutter : 4,5 m
Height to top : 7 m
Distance between pillars : 2,5 m outside & 2,5 m inside
Distance between crop supports : 5 m
Surface per greenhouse 8.200 m2
No. of greenhouses 8
Total surface 65.600 m2

Greenhouse Type 2
Number of spans : 10 units
Width of each span : 8 m
Total width : 80 m
Length of spans : 102,5 m
Height to gutter : 4,5 m
Height to top : 7 m
Distance between pillars : 2,5 m outside & 2,5 m inside
Distance between crop supports : 5 m
Surface per greenhouse 8.200 m2
No. of greenhouses 1
Total surface 8.200 m2

Total surface of the project 73.800 m2



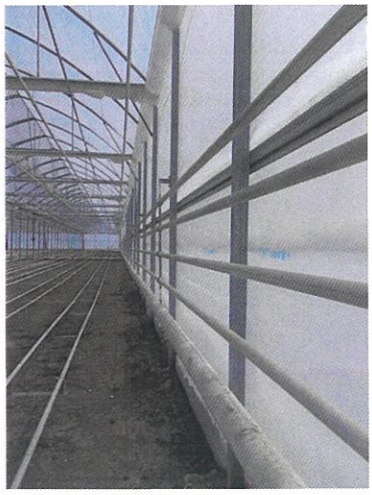
3. Technical specifications

3.1. Structure

All the structure is completely covered by hot dip galvanized coating (by continuous Sendzimir Z275 or discontinuous, including all the fixing joints, and manufactured to rigid European standards. All the steel used in greenhouses is produced according to the specifications of the norm UNE 36.130/9.

- **Doors**

2 sliding doors covered with polycarbonate, placed at the walls of each greenhouse. The door is formed by two sheets and is made out of galvanized steel profiles with-strip brush for a perfect closing.

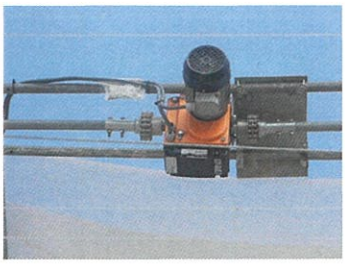


- **Side ventilation**

2 Side ventilations at the gutter walls of each greenhouse with a 2,0 m opening by rolling-up the plastic.
Three-phase motor incorporated and telescopic arms in each greenhouse.

- **Roof ventilation with insect screening**

5/10 Single top with an opening arch of 50*30 mm and 2 m width from the top to the side (1*1/4 span vents) to improve the evacuation of hot air in each greenhouse. Maximum opening of 1,75 m.



3.2. Covering

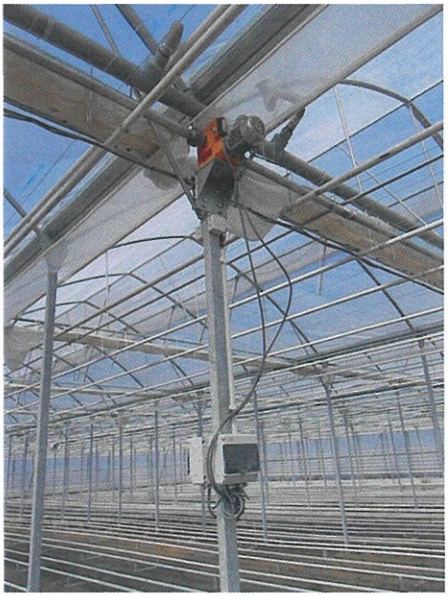
- **Roof, Gutter Walls, Gable fronts**

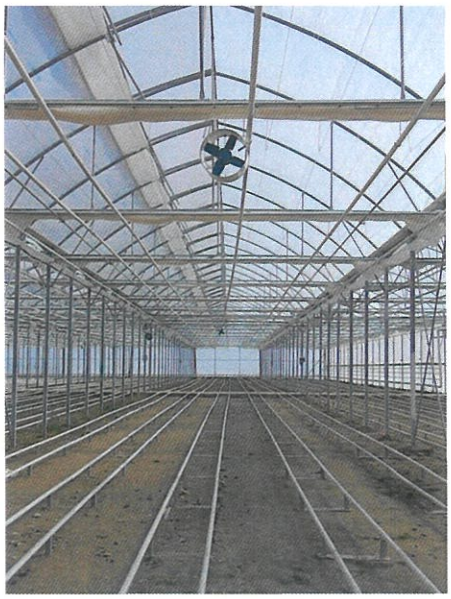
Two layers of IR effect multilayer plastic film.The thickness of the external layer is 200 microns with high diffused effect and anti-condensation treatment inside.

- **Inflating system**

Inflating system formed by 18 Electric air blowers of 0,75 kW (1 HP) (1.800 m3/h) (2 air blowers per greenhouse), PVC pipes, Connectors, Anti-return valves, Protection box

3.3. Sun Screening and ventilation



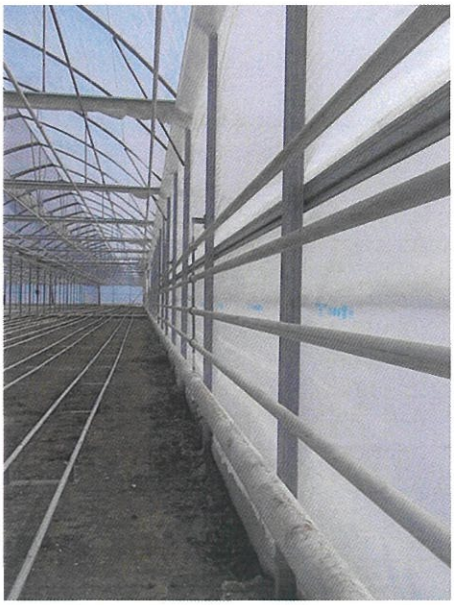


3.4. Heating

- **Horizontal biomass boiler (2*1200 KW each greenhouse) with expansion tank, water filters**

Polycombustible system, possibility of manual loading.

- **Tube rail heating installation , monorail heating installation, gutter heating installatin**



3.5. Water installation

- **Drilled well (for each greenhouse)**

35-100 m deep wells, with fully equipped submersible pumps

- **Irrigation system**

Priva Nutrifit system with integrated computer.


- **Fresh water storage silo**

50 MC storage tank with ring coating


- **Fertilizer tanks**

2 Pcs Polyester tanks with lid mixing/storage tank
1 Pcs PE tank with manhole acid tank

- **Main irrigation line, Valve sets, Drip lines**

3.6. CO2 system

CO2 distribution system is installed. To ensure CO2 in greenhouses there are possibility to be provided through a direct pipeline from a producer and supplier of CO2 found in the vicinity of the vegetables farms.

3.7. Weather station

The sensors measure the outside temperature, wind direction, wind speed, solar radiation, light intensity and rain. As an option also outdoor humidity can be measured.

3.8. Technical and administrative rooms

1 control/dining room
2 separated and fully equipped bathrooms/dressing room
1 Storage

3.9. Additional equipments

12 electrical harvest trolleys, crop wires

4. Potential development

Near the farm there is a surface of 52 hectares of arable land, property, available to develop a culture of vegetables in camp. Also on this property there is a stinky active geothermal water that can be exploited for heating.

Regarding the manpower available, the area has potential to employ qualified labor force, basic activity is agriculture, during the last period at the site were developed training courses in agriculture.