Study for cultivation of Energy crops in Bulgaria

In the spring of [redacted] together with Bulgarian Science Academy, selected and planted experimentally five types of fast-growing species (2 grass species and 3 tree species) “Energy Crops”. These energy crops are planted on land located around the [redacted], owned by the company.

The aim of the experiment is to determine, which of the species are most suitable for growth in the region of [redacted] This experiment will determine which of them are most environmentally, socially and economically suitable to be grown from the local farmers and then sold to the plant for heat recovery.

The selected energy crops are chosen according to the following criteria:

- The species are perennial, they are planted once and only harvesting and bailing is needed for period of 15-20 years.
- The species should grow well on poor lands and require fewer efforts for maintaining through the years in order for the expenses to be minimized.
- The grass dries itself on the field reaching moisture lower than 20% or even less depending on the season.

Because of their perennial type and qualities, the soil is preserved due to fewer pesticides and fertilizers use (only few times for period of 20 years) and the roots enrich and improve the soil. The chosen species must have high annual productivity. By data the yield varies between [redacted] and [redacted] tones per decare dry matter ([redacted] m2), sometimes even [redacted] tones, depending on the climate and the quality of the soil.

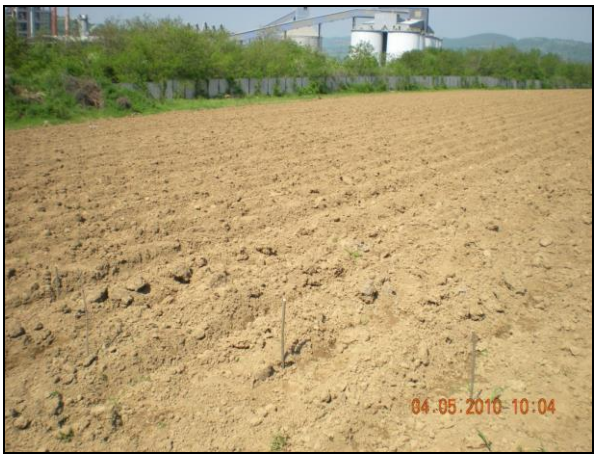
The experiment started in the beginning of [redacted] and will continue [redacted] years, due to the fact that the energy crops need [redacted] years to reach their maximal growth. The final results must be evaluated in the beginning of [redacted] after the second harvest is complete. In the winter of [redacted] first harvest will be complete for the (50% of the maximum growth) for the grasses. Trees should be harvested in 5 years period.

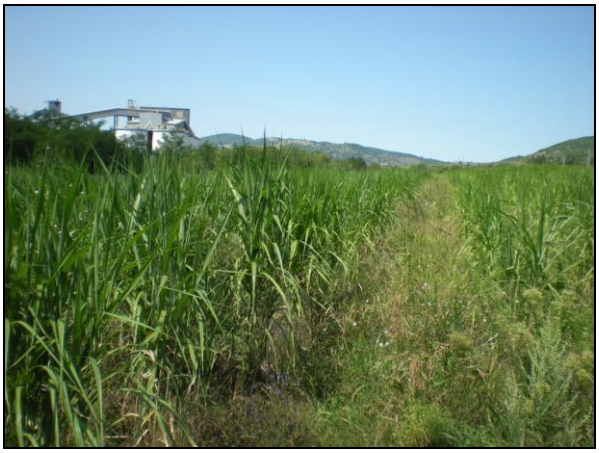
Miscanthus

Actions in [redacted]:
Preparation of the soil
Furrows preparation
Planting (manual) of the rhizomes (roots)
Fertilizer applies
Herbicide applies
Irrigation (once)

Actions in [redacted]
Herbicide apply

Development [redacted]:





[redacted] [redacted]

Miscanthus is inserted and multiplied by roots. It is not invasive, but it is very strong. Each year the crop grows new off-shoots and become more and more wide and tall.

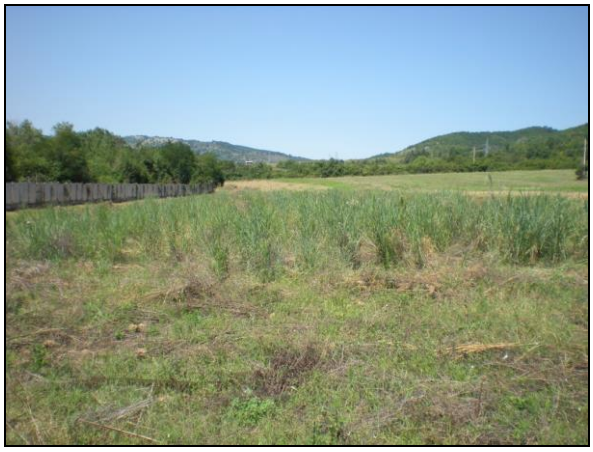
Switchgrass

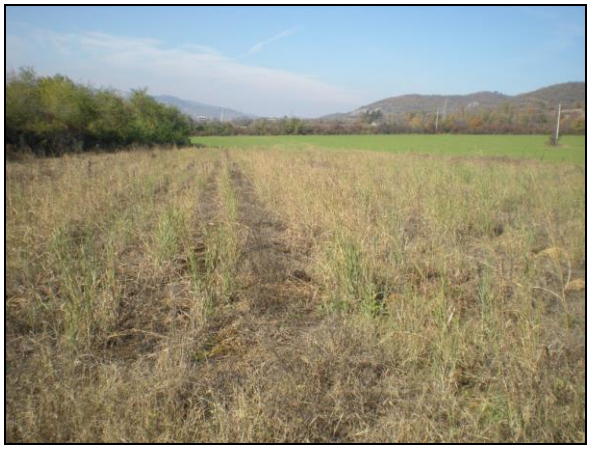
Actions in [redacted]
Preparation of the soil
Furrows preparation
Seeding (manual)
Fertilizer applies
Herbicide applies
Irrigation (once)

Actions in [redacted]
Herbicide apply

Switchgrass is planted by seeds. It is not invasive, because it is a hybrid and it is not fruitful. Each year the crop grows new offshoots and become more and more wide and tall.

Development [redacted]





[redacted] [redacted]

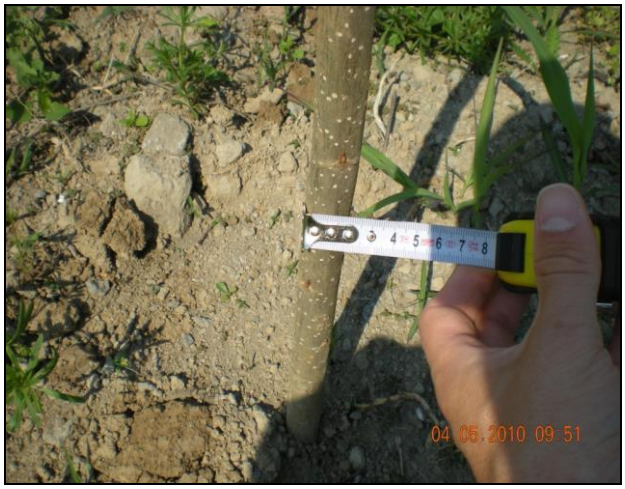
HealtRec

Poplar

Actions in [redacted]
Preparation of the soil
Digging of holes
Planting of saplings (manual)
Fertilizer applies
Insecticide applies
Irrigation (once)

Actions in [redacted]
Hoe the trees
Irrigation (once)

Poplar is planted by young saplings (2 years old). The poplar has 5 rotations, which means that can be cut down 5 times during its live and each time new sprout will grow. The trees can be cut down each three, five or more years.



[redacted]

[redacted]

Acacia

Actions in [redacted]

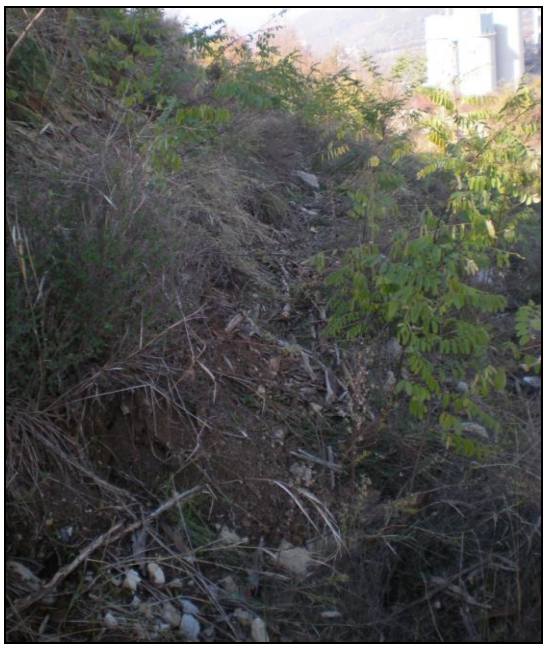
Digging of holes
Planting of saplings (manual)
Fertilizer applies

Actions in [redacted]

Acacia is planted by young saplings (1 year old). The acacia has 5 rotations, which means that can be cut down 5 times during its live and each time new sprout will grow. The trees can be cut down each three, five or more years. The acacia was planted in the quarry and was used successfully for recultivation.

[redacted]

[redacted]



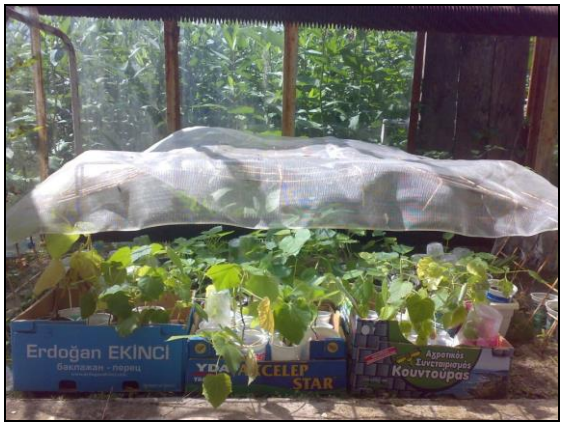
Paulownia

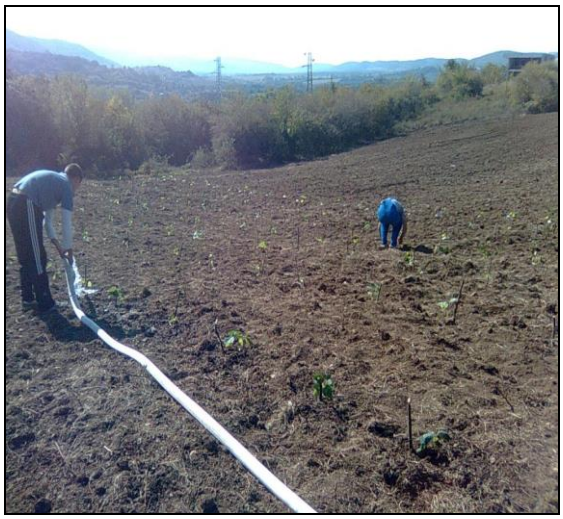
Actions [redacted]
Preparation of the soil
Digging of holes
Planting of saplings (manual)
Fertilizer applies
Irrigation (once)

Actions in [redacted]
Cut the trees
Hoe the trees
Irrigation (tree times)

Paulownia is planted by young saplings (1 year old). The Paulownia have 5 rotations, which means that can be cut down 5 times during its live and each time new sprout will grow. The trees can be cut down each three, five or more years. This tree is pointed for the fastest growing tree on earth.

Development [redacted]





Artichoke

In the autumn [redacted] and the [redacted] started experiment with third grass specie called artichoke. The artichoke was planted by seeding machine and the first growth and harvest is expected in the summer of [redacted].