DANUBE SOYA ASSOCIATION:
A European answer for a sustainable development of GMO free soya

DANUBE SOYA is an international non-profit association based in Vienna which was founded in 2012. The vocation of the Danube Soya Association is to promote the cultivation of sustainable, high quality GMO free soybean in Europe, by catching the added value from the food and feed markets. Organization is present in 16 countries of the Danube region.

Danube Soya association brings together businesses and organizations from every link of the value chain: primary processors, compound feed producers, agricultural traders, and many other partners. Danube Soya provides consumers with safe, sustainable, regional and GM-free soya, ensuring animal keepers long-term security of supply. The long term objective of the association is the cultivation of 1.5 million of ha of soybean in the Danube Region without Ukraine. Ukraine will cultivate 2.4 million ha of soybean in a long term. To sum up, Danube Soya is a brand new program that stands for the use of GMO free soybeans for food and feed quality products.

DO YOU KNOW THE INTEREST OF SOYBEAN CERTIFIED SEEDS?

- Guaranteed potential of the yield;
- Insured quality of future nutritional values;
- Variety purity (99% min) physical quality of the seeds (15% of humidity);
- Good germination (at least 80%) that insures homogeneous growth and harvest;
- GMO free (less than 0,06%);
- 0% pollution tolerance for invasive weeds: Cuscute, Avena fatua, Avena ludoviciana, Avena sterilis;
- Diseases tolerance: mosaic virus increase with farm seeds, Phialophora gregata (brown stem rot of soybean), Phytophthora megasperma fsp, Glyceria (Seeds contamination);
- Investments in R&D with objective to increase the yield, protein quality / content and diseases tolerance and the soybean germplasm improvement.

Soybean certified seeds – it is a guarantee of quality and quantity for the farmers and the industry

EURALIS: THE LEADER NON GMO SOYBEAN SEED COMPANY

<table>
<thead>
<tr>
<th>EARLINESS GROUP</th>
<th>SOYBEAN VARIETY</th>
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</thead>
<tbody>
<tr>
<td>ESG141</td>
<td>ESG SENATOR</td>
</tr>
<tr>
<td>(ES COMANDOR)</td>
<td>ES MENTOR</td>
</tr>
<tr>
<td>ALIGATOR</td>
<td>ES TENOR</td>
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<tr>
<td>ES NAVIGATOR</td>
<td>ES DOMINATOR</td>
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HOW TO CHOOSE A SOYBEAN VARIETY?
DID YOU KNOW?
1. Preparation of the soil

Objective: To have a good seed-bed and a good structure of soil for a rapid and homogenous establishment, a good development of root nodulation, to facilitate soil warm up.

Soybean can be cultivated on many types of soils. If the cultivation is done without irrigation, it is recommended to avoid soil with weak capacity to hold water (superficial clay-limets or sandy soils) and to focus on deep soils. Although, limetone soils should also be avoided when the acid level is higher than 10%, as it can cause iron chlorosis and limit the nodulation, as a result to reduce the development of the plant and the yield. A soil crusting during soybean emergence can decrease the future development due to rootlets damages. That is why the soil work should be done before the planting. Place the soil and reduce the compactions, you should also limit machine passing and avoid working with wet soil. Rotation of soybean every third year should reduce Sclerotinia disease risk and specific weeds problems.

2. Planting

Objective: To succeed a precise homogenous planting based on the maturity of the variety.

While seeing soybean, pay attention to the level of precision that you can have with the machinery. More homogenous separation of seeds you have – better it is.

3. Inoculation / Fertilisation

Objective: To provide the plant with the necessary elements on the right stages.

INOCULATION

For a good development of soy, especially at the early stages, the crop needs nitrogen. 25% of the need (100 kg/ha) are coming from the soil, the rest should be given. Inoculation with a bacteria Rhizobium japonicum will help to produce the needed nitrogen. When bacteria touch the roots of the plant we can observe the place of the symbiosis by the appearance of the nodules. The bacteria are fixing the nitrogen of the air and provide it to soybean. From its side, the roots of the plant we can observe the place of the symbiosis by the appearance of the nodules. Inoculation should be done carefully because bacteria and seeds are fragile.

FERTILISATION

- Phosphor and potassium: Soybean crop has moderate needs in microelements, but they are necessary. We can bring the phosphor and potassium during soil preparation. Above are general advises for the inputs:

   - Phosphor: 100 kg/ha should be applied. It can be done 15 days before sowing. The application can be done in 1 or 2 fractions. That is why you need to start between the beginning of flowering (R5) and the stage of first pods appearance (R3). Urea nitrogen is preferable and if crop is under irrigation, nitrogen should be given before it.

   - Potassium: 100 kg/ha or 50 kg/ha should be applied. If you may have a high Sclerotinia risk, a preferable precaution is to leave 50-60 cm between rows to have better aeration.

4. Weeds control

Objective: Prevent the weeds development at critical stages between cotedylenons’ emergence and formation of the third node (sow on 1-2 trifoliate on the plant).

5. Diseases

Objective: To take the preventive measures against diseases.

SCLEROTINIA: If in the plot sclerotinia have already been observed on different crops, it means the plot is risky for soyas as well. The risk of the disease can also appear in averagely deep to deep soil if the ground is wet.

- It is advised to adapt irrigation for soyas by spacing soil aeration sessions while increasing the water given per session.

- To eliminate the sclerotinia risk the best option is to choose the varieties with a low susceptibility to it and high tolerance to lodging. Fuscas varieties are selected for this matter.

6. Water supply

Objective: Increase and secure yield performance

The easiest option for secure the yield is to get the cultivation under the irrigation. Irrigation on soybean is recommended not to be made during the whole vegetation cycle up to 20 days before the harvest. The irrigation at the first pods maturity stage with brown color can increase the general yield and improve the quality of grains – protein content.

- If, the irrigation can’t be done the region should have sufficient precipitations. To reach the yield of 3.5-4 tons/ha on the deep soils 100 to 150 mm of precipitations are needed and on the light soils – 200-250 mm.

7. Harvest

The maturity is reached when kernels are “jingling” in the pods. To harvest the soybean it is preferable to use a floating flexible cutterbar and automatic control of header height. Soybeans might be harvested at moisture levels < 25%, but the yield must be stored at 14% of moisture or lower corresponding at the stage when the leaves have fallen.

A floating cutterbar can be used to cut the soybean plants entirely, closer to ground level. Adjust the cleaning fan to provide maximum air. Adjust the chaffer to allow the fan to separate pods and stalk pieces from the soybeans. Adjust the sile to allow the pass of soy bean only. Adjust the air speed, chaffer and sile settings during the whole day of harvest, depending on weather conditions and soybeans possible changes.

The soy beans are very susceptible to shock and break easily. If the soy beans are destined for food consumption, careful harvest is inevitable, as the requirement is to provide the white beans. That is why think always about the importance of the harvest adjustments.

8. The advantages of Soybean

- Good in rottions with cereals, as break the cycle of some weeds. Diabrotica on corn roots and mycotoxins of cereals
- No special need of nitrogen due to Rhizobium inoculation
- Low pesticide inputs to control diseases and insects
- Moderate water requirements, less than corn.
- Adaptable to different techniques of cultivation
- Has multiple opportunities for the usage in feed and food
- Is a focus interest of the European Agricultural policy to reduce the dependence on vegetable proteins

Soybean plant does not cover much the soil. It is very sensitive to weed competition at the early stages of the vegetation cycle.

Depending on the present or expected weeds, herbicide application can be done. There are two suitable moments: either at pre-emergence or post-emergence stage. Pre-emergence application with common herbicides might be reinforced by the second application after the plants emergence.

From another side, if you need to limit the herbicide application for 1 time, a post-emergence Pulsar 40 has a wide efficiency spectrum. Intervention with Pulsar 40 (maximizes of 35mm) should take place at R1-R2/R1+1. But there are however treatments that you have the problem, especially on the corn. Limit post sulphuron risks, by good preparation of the soil, avoiding soil compaction. Avoid nearly flooded areas as well.

Rhizoctonia: A disease that is attacking the roots. It is also uncommon to corn. The attacks are limited to spots on the field. The plant becomes yellowish and dry down in time. Avoid the fields where the disease had already been identified, especially on the corn. Limit root sulphuron risks, by good preparation of the soil, avoiding soil compaction. Avoid nearly flooded areas as well.

Earliness Crop method Population Objective

<table>
<thead>
<tr>
<th>Stage</th>
<th>No irrigation</th>
<th>With irrigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>400,000</td>
<td>450,000</td>
</tr>
<tr>
<td>II</td>
<td>350,000</td>
<td>400,000</td>
</tr>
<tr>
<td>III</td>
<td>300,000</td>
<td>350,000</td>
</tr>
<tr>
<td>IV</td>
<td>250,000</td>
<td>300,000</td>
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<tr>
<td>V</td>
<td>200,000</td>
<td>250,000</td>
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<tr>
<td>VI</td>
<td>150,000</td>
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</tr>
<tr>
<td>VII</td>
<td>100,000</td>
<td>150,000</td>
</tr>
<tr>
<td>VIII</td>
<td>50,000</td>
<td>100,000</td>
</tr>
<tr>
<td>IX</td>
<td>0</td>
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Soybean on the optimal harvest stage (whole beans. That is why think always about the importance of the harvest adjustments. Soybean has multiple opportunities for the usage in feed and food, has multiple opportunities for the usage in feed and food.
**How to choose a Soybean variety?**

Euralis is a member of Danube Soya association since its beginning. Euralis is the only company that proposes the full range of varieties in different groups of precocity: from 000 to II.

But how to choose correctly the right variety?

All over the world, in total 13 groups of maturity exist. In Europe, the most common earliness groups of soybean are:

<table>
<thead>
<tr>
<th>Group</th>
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<tr>
<td>000</td>
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<tr>
<td>00</td>
<td>early</td>
</tr>
<tr>
<td>0</td>
<td>mid</td>
</tr>
<tr>
<td>I</td>
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</tr>
<tr>
<td>II</td>
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But in Americas, for example, you may also observe some other groups, as X group - the latest one.

Depending on the region, Euralis recommends different varieties.

![Recommended soybean varieties, depending on the European region](image)

Choose variety according to 5 criterias

1. **Earliness:** Adapt the choice to the region, sowing date and calculate the right sowing density.
2. **Productivity:** the potential that you can get with the variety
3. **Susceptibility to sclerotinia:** avoid sensitive varieties in critical situation: short rotation, previous crops sensible to sclerotinia or planting in irrigated conditions;
4. **Lodging resistance:** a good behavior makes the harvest easier and limit sclerotinia development,
5. **Protein content:** a high protein content is required by the food industry.

**Do you know soybean diversity?**

Germplasm of the soybean is extremely diversified. In the world there are 170,000 identified accessions of soybean. The leader is China with 6,510 accessions. In Europe, the leader country is Russia with more than 1,000 different accessions. The differences can be seen in different ways: in the color of the grains and flowers, in the shape of pods, in the development of the stem and roots systems. Here some examples of different accessions of soybean:

![Accessions of soybean diversity](image)

**Do you know soybean utility?**

Soybean is a very rich and useful crop. Its components are:

**I. PROTEIN:** among all crops, soybean is one of the richest in protein. It provides all the amino acids needed for a human balanced nutrition. The soybean protein in its composition is close to high quality animal protein, coming from meet. Average level of protein in certified soybean is around 40%.

**II. OIL:** with high level of around 18-20%, the soybean is a source of quality vegetable oil, containing polyunsaturated fatty acids, useful for good health.

**III. A LOT MORE:** lecithin, tocopherols, saponins, glycerol, isoflavones and phytoserols, widely used in food processing presenting potential benefits for human health due to the anti-oxidant effects.

**Soya for food**

Whole, dry soybean, tofu, soy drink, soy nuts, soy-based foods, such as frozen deserts and cheddar-flavored soy slices, developed for people suffering from lactose intolerance. Textured soy protein (TSP), soy flour – gluten-free products that can be used in some recipes as a substitute for wheat flour. Miso: a smooth, salty paste made of ground soybeans and used extensively in Japanese cooking. Tempeh – a chunky, tender soybean cake that is a traditional Indonesian food. The diversity of the products confirms the wide usage of soybeans in human healthy nutrition.

**Soya for feed and industry**

The most widely used product of soybean crushing is soybean meal (cake) used for livestock and poultry ration to bring high quality proteins. Sometimes we can meet it in pet nutrition preparations. From other side the crop is also used in industry for wood adhesives, rubbers and plastics productions, textiles, resins, printing inks, cosmetics...

To sum up, soya is used widely due to its numerous characteristics and the farmers can easily sell their harvest if they insure its quality.

**DID YOU KNOW?**

The Soybean is an ancient crop with more than 4500 years of history. Origins take the roots in North-East Asia, most probably in China. Latin name of Soybean is Glycine hispida (Moench) Maxim (1873), Botanical family of Leguminosae (more 12,000 species), subfamily Papillionideae. Traditional line variety is Cleistogamous with completely closed flower and little cross-pollination (less than 1%). In nature 3 different groups of soybean exist: determined, semi-determined and undetermined. A task of the breeders is to find the most suitable combination among different types of soy to get the best results in specific zone.

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