



Source: Taifun-Tofu GmbH

## Assessment of collectors for soy food production

Companies that collect, clean, dry and store soybeans are important partners in the contract cultivation of soybeans for soy food production. For soy-based foods, such as tofu, soybeans must be handled very carefully. Therefore, intermediate storage on farms - unlike for animal feed - is generally out of the question. This holds particularly true for difficult harvest lots, such as those with high moisture levels or high weed infestation which must be brought to the collector immediately after harvest.

In the best case, the collector and the farmer are no more than 50 km apart. This makes it possible to deliver the harvest by tractor and trailer. Distances of up to 250 km can still be easily covered by truck, taking into account statutory driving time regulations. In order to make good use of truck capacity, farmers should cultivate approx. 8 - 10 ha of soy or multiples thereof (10 ha x 2.5 t/ha = 25 t maximum payload), depending on the expected yield.

As a food producer, it is a good idea to work with collectors on the basis of service contracts. In this case the harvest is settled directly with the contract farmers. The collector is not paid for soybeans, but only for the provided services. In the following you will find information for the selection and evaluation of collectors.

Further information (currently mainly in German) on drying, cleaning and storage of soybeans can be found on the website of the German Soy Promotion Ring (Deutscher Sojafördererring e.V.; [www.sojafoerderring.de](http://www.sojafoerderring.de)) under the heading "Nach der Ernte". Under the heading "Markt" you will find a [brochure](#) with detailed information on the contract cultivation of soybeans for food production.

# I Initial assessment

## 1. Equipment

### 1.1. Silos

#### 1.1.1. Number and size

How many silos with what capacity are available?  
Can different qualities be assessed separately?  
Are there small silos for assessing problematic lots?

Flat stores that are emptied by wheel loaders are generally not suitable for storing soy for food products.

#### 1.1.2. Gentle drop heights?

Soybeans can easily be damaged by mechanical stress. This ranges from micro cracks in the seed coat to breakage and abrasion. The drier the Soybeans the more sensitive they are. At 14% residual moisture, they are significantly more elastic than at 11%. A rule of thumb for the evaluation of drop heights is

- up to 12m: gentle
- to 21m: acceptable
- >21m: critical

#### 1.1.3. Storage period

How long can the soybeans be stored? Silo space is scarce and the operator usually wants to handle as much goods as possible. Soy competes with other crops such as cereals (main harvest in July) or grain maize (harvest in September and October similar to soybeans). Stockists often demand that the soy silos are cleared for the next grain harvest.

#### 1.1.4. Temperature sensors in the silo?

Especially immediately after harvesting, soybeans are still "microbially active" and tend to warm up. This applies in particular to inhomogeneous batches with varying residual moisture. So-called "hotspots" can easily form in these batches.

#### 1.1.5. Possible reactions to temperature rise?

In order to counteract a temperature increase in the silo, it should be possible to circulate the soybeans to another storage silo.

#### 1.1.6. Ventilation option?

Especially immediately after harvesting, a ventilation option is very helpful to stabilize soybeans and to counteract warming.

#### 1.1.7. Possibility for cooling?

If soybeans are to be stored particularly gently or for longer than one year, they must be cooled to approx. 12 °C. Details can be found in the [Taifun soybean info "Storage of soybeans"](#).

#### 1.1.8. Previous use / other uses

If you are using the silos with your soybeans for the first time or do not use the storage exclusively all year round, you should check the previous use. For example, there is the danger of mixing with allergens (wheat, lupines) or genetically modified soybeans.

#### 1.1.9. Type of silo cleaning

Is it possible to clean the silos thoroughly? Can cleaning personnel be roped down in the silos? Are suitable extraction units available?

#### 1.1.10. Bird protection

Especially with smaller silos which are often set up inside halls, it must be checked whether they are completely closed at the top so that no bird droppings can get into the stored goods.

#### 1.1.11. Protection from rodents

Are the silos and other plant components designed in such a way that rodents (rats, mice) cannot penetrate? Are outdoor traps and a monitoring system in place?

## 1.2. Reception and removal from storage

### 1.2.1. Canopy available?

Can the delivery and removal of soybeans be carried out regardless of the weather?

### 1.2.2. Weighing raw material before recording?

Can the delivered goods be weighed before tipping (weighbridge)?

### **1.2.3. Sampling system**

Are facilities available for representative sampling of the delivered soybeans? Sampler (manual or automatic) should have a diameter of approx. 5 cm. Samplers, which are otherwise used for grain maize, are also suitable for soy. Smaller samplers used for cereals are usually not a good choice.

If soybeans are to be assessed directly from the field, special care must be taken when taking samples. In particular, batches with a high weed load can segregate on the transport vehicle during the journey to the collector. Weed seeds are then often located at the bottom of the transport vehicle.

### **1.2.4. Sample Cleaning**

When assessing soybeans from the harvest: Which systems for sample cleaning are available (hand sieves, automatic sample cleaner)?

### **1.2.5. Measurement of moisture and composition**

Are calibrated instruments available to measure at least the moisture content of soybeans? Ideally, there is an NIRS or NIT device to quantify nutritional composition such as crude protein content.

### **1.2.6. Gentle conveying systems?**

Conveyor systems stress soybeans in different ways. Also here counts: The drier the soy, the more sensitive it is. If the use of augers is unavoidable, they should only be operated under full load and at low speed to avoid breakage and shell damage. Chain conveyors are better, the current best solution are conveyor belts.

### **1.2.7. Avoidance of cross-contamination**

Does the silo system also collect other agricultural goods in addition to soybeans? If so, how is it ensured that no cross-contamination occurs?

### **1.2.8. Delivery times and conditions**

At what times can soybeans be delivered? How must deliveries be announced (notification)?

### **1.2.9. Who is responsible for the receiving and storage of soybeans?**

Are the persons trained in handling soya?

## **1.3. Drying**

### **1.3.1. Drying capacity**

If soybeans are received from the harvest: What is the dryer capacity in relation to the harvest quantity? Is it realistic that even under unfavourable harvesting conditions (longer rain spells) the delivered soybeans can be dried?

### **1.3.2. Gentle drying of the soybeans?**

Which type of dryer is used? Can the available control system be used to ensure that the core temperature of the soybeans does not exceed defined values (e.g. 35 °C)?

## **1.4. What cleaning facilities are available?**

- Seed cleaner with windsifter (standard)
- Destoner: With soybeans, a destoner usually is necessary because of the low cutting unit.
- Gravity separator. For problem areas, such as the removal of burdock.
- Colour sorter. Very useful for high demands on the cleaning quality of the soybeans, e.g. in display packaging for end consumers.

## **2. Quality assurance**

**21. Who is the contact person for quality management?**

**22. Optional: Is the collector organically certified?**

**23. Is there a HACCP concept?**

**24. Are there previous experiences with soy at the collector?**

**25. How is the documentation of incoming goods regulated? Is there an IT-supported system?**

**26. Are special acceptance protocols of the client accepted?**

27. Is it possible to integrate the transmission of acceptance protocols and soy samples to the customer into the processes?

### 3. Insurance

31. Is there a stockholder liability with sufficient coverage?

32. Is there a natural hazard insurance?

## II Evaluation after each harvest campaign

### 4. Performance of the last harvest

41. Which errors occurred and how were they dealt with?

42. Were the samples properly drawn and evaluated on delivery of the harvest?

43. Has the collection and transmission of harvest data worked?

44. How was the service orientation towards farmers?

45. How was the quality of drying and cleaning? Has the specification been observed?

## III Future orientation

### 5. Future orientation

51. What is the willingness to make investments that serve our company?

52. What is the state of innovation and openness to new technologies and organizational forms?

For comprehensive information on all aspects of soy cultivation visit:

[www.sojafoerderring.de](http://www.sojafoerderring.de)

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