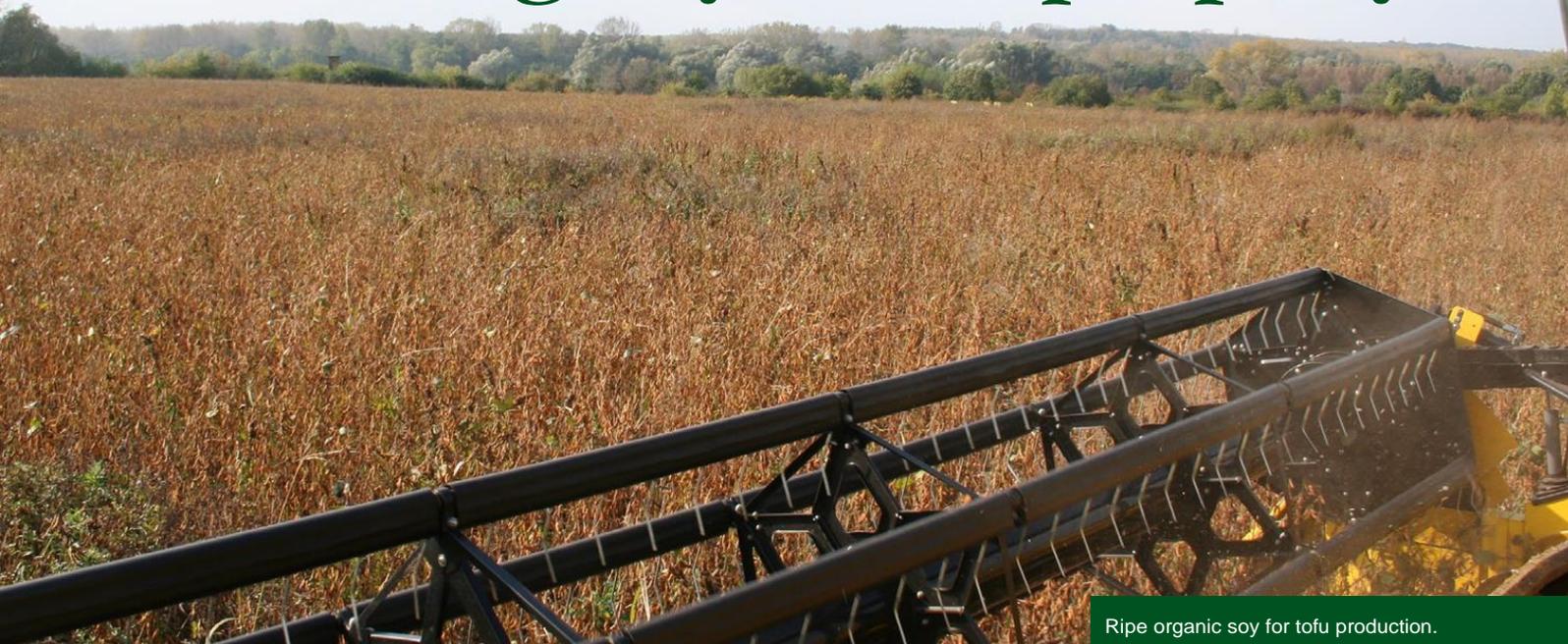




Specialist information for soy producers and processors

## Threshing soybeans properly



Ripe organic soy for tofu production.

The cultivation of soybeans for food products is strongly increasing in Germany. As for the production of soybean seeds, this requires a high level of quality awareness, especially during harvesting.

In general, soybeans can be threshed well. The seeds are easily removed from the pods. Modern varieties mature evenly and prematurely bursting pods are rare nowadays. The challenge lies in the very deep pods and the tendency of the seeds to break. In addition, problems with the weather can arise due to the late harvest on marginal sites.

### Threshing as early as possible

Like everywhere else in agriculture, the soy harvest is all about timing. Especially when producing seeds or consumer goods, it is important to use the first possible date. Each remoistening of mature stands reduces the germination capacity and promotes fungal infestation.

In warm and humid conditions the *Diaporthe* fungi, which are notorious in soybean seeds, can lead to the deprival of promising stands for seed propagation within a short time. Additionally, soybeans with visible *Diaporthe* infestation are not welcome in consumer goods either. This is less of a problem in feed because, surprisingly, mycotoxins play virtually no role in soybeans.



Strong *Diaporthe* infestation after a missed harvest (left in the picture).

The aim is to harvest at the beginning of October at the latest. Here, sowing at the first optimum time and a choice of varieties adapted to the location pays off. In October the risk of long periods of bad weather increases considerably. Due to the deep cutter bar guidance required for soybeans, soil uptake by the harvester is intensified when the soil is moist.



Rainy year 2013: Those who had not yet sown at the end of April were often caught by extremely wet conditions for the soy harvest.

Depending on the weather, it takes about three to five weeks from the yellowing of the stands to the shedding of the leaves and to threshing maturity. With appropriate weather conditions, the grains can dry out very quickly.



This crop is ready for harvesting - despite some green leaves and pods. The decisive factor is the grain moisture content, which should not be below 13 percent at harvest time.

As a rule of thumb the seeds are ripe when they begin to rustle in the pods. Green pods are often still found in the stand and even green plants can be found on moist spots in the field. A common mistake in soy harvesting is to wait for the last green pods to ripen. By then either the main part of the stand is much too dry or the harvest weather is over and it rains. The threshing humidity is decisive for the success of a quality-conserving harvest. With every percent dryness, the tendency of the grains to break increases noticeably. In the case of seed production, harvesting often begins at 16 percent moisture. Below 13 percent, losses in germination capacity can hardly be ruled out, even with optimum technology and machine operation. Here it is advisable to wait for dew in the early morning hours. The settings of the combine harvester should always be adjusted if the grain moisture changes. Soy for feed is threshed at 12 to 14 percent moisture with regard to the drying costs. Storage moisture is 12 to 13 percent, for feed also up to 14 percent.

## The cutting unit – challenge of low pods

The lowest pods of soybeans are just above the ground. Under unfavorable conditions in the early development stages of the soybean, such as those caused by the drought in many places in 2014, the lowest pods can lie directly on the ground. This means that harvest losses ('stubble loss') of over 500 kg/ha are not uncommon. 300 kg are considered normal, losses under 200 kg are difficult to achieve even when everything is right. According to the breeders, the wish repeatedly expressed by soybean farmers for varieties with higher pods will hardly be fulfilled. In truth the differences in pod heights are usually due to differences in sowing and seed quality.



As low as possible, as high as necessary! A level seedbed and no stones on top of it are the be-all and end-all in soy harvesting. Flex cutter bars pay off even for medium large areas.

### The basic rule is:

- Drive slowly, guideline 4 km/h. Otherwise the cut will be inaccurate and losses will increase.
- A level seedbed is a prerequisite for deep guidance of the cutter bar.
- Collect stones or roll them in.
- Optimum sowing and seed quality help to raise the pod height.
- Depending on the manufacturer, the cutting unit can be guided close to the ground. It is essential to check this before harvesting, if necessary, a modification of the skids is necessary.
- With a little craftsmanship, the cutter bar can be made steeper by modifying the suspension. This brings the cutter bar closer to the ground. The resulting lateral gap between the cutter bar and the inclined conveyor is sealed with construction foam. Practitioners report very good success with this trick.
- Narrow cutter bars can be guided lower than wide ones. At working widths of more than five meters, larger losses can only be avoided with flexible cutter bars. Details on flexible cutter bars can be found in Taifun Soybean Info No. 14 "Flex cutting units - Technology and market overview".
- Crop lifters are not required. In dry conditions they rather damage the crop by shaking out the pods.

### The reel - little helps a lot!

The reel does more damage than good if it runs too fast or too far ahead and causes pods to burst open prematurely. Its task is limited to holding the soybean plants in position while they are being cut and directing them forward towards the threshing table the next moment. It can be useful to fit the reel with simple plastic tubes to avoid coiling of plants around the cross tubes. New reels often already have wider cross tubes.



In many cases the soy straw is still clammy and tough when it is harvested. Wider cross tubes protect against coiling plants.

### The threshing drum - gentle threshing for fragile seeds!

In addition to the grain moisture, the drum setting is decisive for the harvest quality. As with lupines or peas, the speed must be reduced considerably. A guideline is 400 rpm, depending on the make of thresher and bean moisture. The threshing concave is set as narrow, that few pods are returned to the retreat.



Modern soy varieties usually mature evenly and are easy to thresh

However, it should not be too narrow, especially in the case of large-grained varieties. The low straw content of soy leads to increased stress on the grains in the drum. As the driving speed is limited by the relatively firm stems, this can only be compensated for by larger cutter bar widths - if possible with a flex cutter bar. A uniform crop flow is also advantageous for a nice threshing process - an argument in favor of a belt cutter bar. The following details can help to achieve good results when harvesting seeds and consumer goods:

- Badly centered or worn threshing drums cannot be adjusted precisely.
- The smoother the throughflow, the better. Removing the threshing bar from the drum can reduce breakage.
- With the soaking test it is quick and easy to check how much the beans are damaged by the threshing process. Details of the soaking test can be found in Taifun Soy Info No. 4 "Soaking test for soybean seeds".

## Rotor or drum?

With optimum grain moisture, acceptable results can also be achieved with a well-maintained drum thresher. Especially with low grain moisture, however, rotor threshers have a clear advantage when it comes to maintaining grain quality. The use of maize baskets has proved to be a successful method. Due to the large openings, threshed grains are segregated more quickly and are therefore less stressed than with grain baskets.

## Cleaning - easy thanks to the large, heavy grains

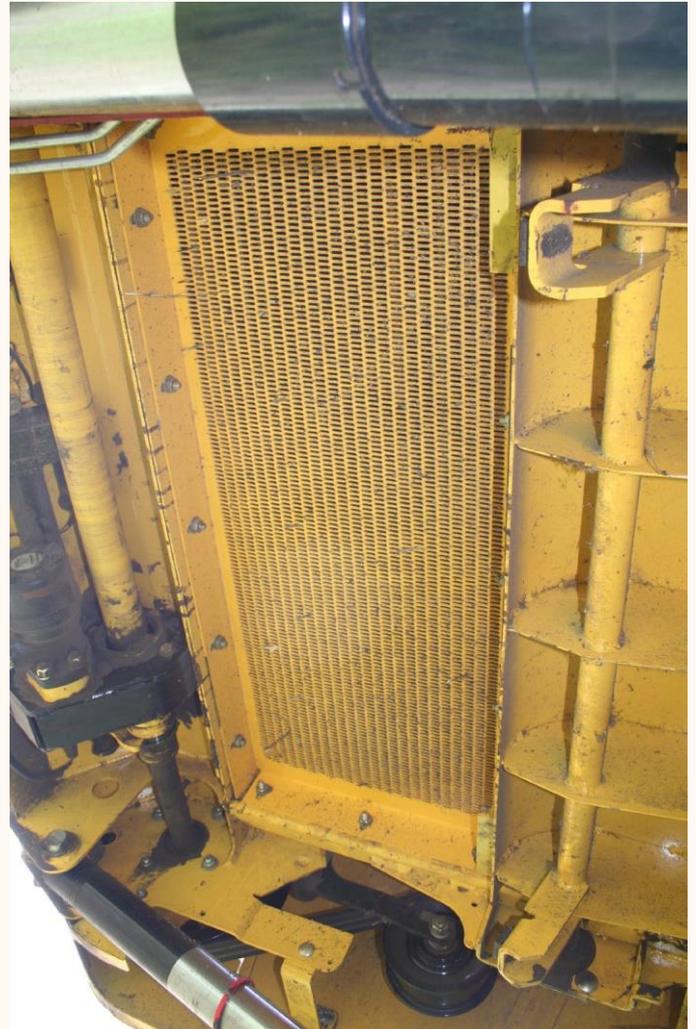


If the grain tank is made too full, friction and breakage occurs at the screw conveyor

For cleaning, the upper sieve should be set to 15 to 18 mm, the lower sieve to 10 to 12 mm, depending on the grain size. Fine debris is separated by strong wind. Cleaning can be a challenge when soy stands are heavily weedy. This is where perforated plates in the conveyor of the thresher can help. Depending on the manufacturer, perforated plates can be installed at the front of the inclined conveyor, in the grain conveyor or in the overhead loading screw. In this way, the proportion of weed seeds that bring moisture into the crop can be significantly reduced.



When discharging, the screw should run at full load to avoid breakage. It is better not to empty the tank completely.



A perforated plate in the inclined conveyor separates weed seeds before they come into contact with the crop

## Contractors - Who's ready for soybean harvest?

Soy is a relatively new crop for most thresher operators. Especially when it comes to contractors, it is too late to deal with the special features once the harvest has started. However, a driver who does not know important details will inevitably produce poor results. When the seeds have already dried to 13 percent, there is no time to deal with the depth control of the cutter bar and details of drum adjustment.

In our experience, it is perfectly justified to pay a supplement for harvesting soybeans if the driver in return brings peace of mind and is prepared to drive slowly and pay full attention to the cutter bar guidance.

## Links

### Soya harvest explained in pictures -

You can also watch our video on the subject:

<https://www.sojafoerderring.de/anbauratgeber/ernte>

### Film interview with a Canadian soybean expert on combine harvester adjustment and technology

<https://www.youtube.com/watch?v=9iEHEIs2QOg>



Thanks to the large grains, threshing losses can be controlled quickly and easily. As a rule, almost 100% of the losses occur at the cutter bar.

**For comprehensive information on all aspects of soy cultivation visit:**

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

### Imprint

Author: Fabian van Beesten

Editorial assistance: M. Miersch

Translation: Stefan Paul

Publisher: Taifun-Tofu GmbH

Bebelstraße 8 | 79108 Freiburg | Tel. 0761 152 10 13

[soja@taifun-tofu.de](mailto:soja@taifun-tofu.de)



**Taifun**  
Zentrum für  
Sojaanbau

Funded by the Federal Ministry of Food and Agriculture on the basis of a resolution of the German Bundestag within the framework of the BMEL Protein Crop Strategy.

**ptble**

Projektträger Bundesanstalt  
für Landwirtschaft und Ernährung

Gefördert durch:



Bundesministerium  
für Ernährung  
und Landwirtschaft

aufgrund eines Beschlusses  
des Deutschen Bundestages