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& DEVELOPMENT
CORPORATION

SOYBEAN

SECTION 12

HARVEST

HARVESTING | PRE HARVEST CHECK LISTS | HARVEST TIMING | DESICCANTS | HARVEST LOSSES | BIN SAMPLE QUALITY | HANDY HINTS | WET HARVEST ISSUES AND MANAGEMENT | RECEIVAL STANDARDS | HARVEST WEED SEED MANAGEMENT

SECTION 12

Harvest

12.1 Harvesting

Harvesting of soybeans can be challenging regardless of the end-use for the beans; however this challenge becomes critical when ensuring high quality soybeans for the food grade market. With the right equipment and attention to detail it is possible to harvest the maximum amount of soybeans you have grown at the desired quality parameters.

The aim at harvest is to collect the maximum amount of soybeans at the optimal time (optimal throughput) with highest possible sample quality and purity, and with the lowest possible losses. Grower payment is conditional on tonnage delivered, moisture content, test weight and on seed sample quality and purity. Crop establishment and harvest management have a major effect on all of these.

In summary, harvesting soybeans to maximise yield and quality can be achieved by:

- Ensuring the best agronomic practices, compatible with harvest.
- Minimise pre harvest losses. For example, if dessicating the crop, timing is critical and using the widest boom possible to minimise seed loss from trafficking during the spray-out operation.
- Correct set up of the harvester.
- Minimise gathering losses.
- Minimise processor losses.
- Obtaining the best possible bin sample for quality and purity.[1]

Figure 1: John Deere's STS 9760 with rotary threshing and separation shown in Iowa soybeans. The two types of combine harvesters in Australia–rotary and walker-or drum-type - are now all fully imported. Rotary separators dominate the modern market. John Deere no longer offers walker-types. In Australia we call such machines "headers" but the fact that these machines are all imported and take in more than just the crop heads may spell the eventual end of that name. (Photo: Australian Oilseeds Federation)

[1] Australian Oilseeds Federation (2013), Better Soybeans manual http://www.australianoilseeds.com/soy_australia/Soybean_Production

Figure 2: New Holland TC 5090 combine made in Belgium with five walkers shown. Walker separation is preferred in much of Europe where crop conditions are moister and farmers want the longer crop straw for baling. Lately there has been a move to hybrid machines in Europe for higher capacity at some sacrifice in straw quality. (Photo: Australian Oilseeds Federation)

12.2 Pre harvest check lists

12.2.1 Row spacing - narrow or wide?

This is primarily an agronomic decision but the decision has an effect on harvest performance. Plants grown in narrow rows (e.g. 178 mm (7 inch drilled beans)) tend to grow taller on a single stem. This means that the lowest pods will be higher and if you own an older fixed-platform head that will mean much lower gathering losses. If you have the area, it pays handsomely to use a gathering head with a floating cutterbar. Using a pickup reel rather than a bat reel will give superior results. The floater and pickup reel can outperform a fixed platform and bat reel by as much as 5% of your crop. Modern draper-type heads have better capacity and have been offered with floating cutterbars over the past few years.[2]

12.2.2 Pre-harvest header/combine check

First check the cutterbar: worn and broken knife sections lead to significant losses and problems with weeds.

Check reel and auger settings as recommended in the operator's manual.

During normal pre-harvest servicing, be alert to sharp edges that can cause soybean damage and excessive splits.

Make sure that sharp edges are worn off or smoothed on augers, bubble-up, front elevator flights, and watch out for wear under chromed thresher elements.

Replace perforated screens under augers. Uneven concave and thresher elements result in uneven separator performance and damage.

While the feeder house is detached on walker machines, check for worn and bent rasp bars on the drum and set for uniform clearance between drum and concave. Check the operators' manual regarding concave wire recommendations and all settings for soybeans.

Be sure the stone trap is emptied of rocks.

Excessively worn clean grain and return elevator slats and loose chains cause grain to flow back and accelerate seed damage.[3]

12.3 Harvest timing

[2] Australian Oilseeds Federation (2013), Better Soybeans manual http://www.australianoilseeds.com/soy_australia/Soybean_Production

[3] Australian Oilseeds Federation (2013), Better Soybeans manual http://www.australianoilseeds.com/soy_australia/Soybean_Production

Moisture measurement is critical. Harvest could start at 17% moisture content when there are still a few leaves on the plants, but may lead to a need for drying. Ideal harvest moisture is 12-14%. Lower moisture content will result in more losses due to shatter and to threshing damage. Check your moisture meter (whether hand-held or on-board) against a reliable standard.[4]

12.4 Desiccants

Crop desiccants/harvest aids like Reglone® or Roundup PowerMax® are commonly needed in coastal areas and other seasonally humid areas to manage weeds, hasten leaf drop and facilitate uniform harvest conditions. Weigh up the costs of a desiccating operation on crop damage and losses due to running down some of the crop. Speak to an agronomist experienced in desiccation of soybeans when deciding when and how to desiccate.[5]

12.5 Harvest losses

Losses in a soybean crop cost the grower significantly; irrespective of whether food grade or stock feed varieties. Every kilogram of seed lost at harvest eats into profits. Smart harvest operators and managers find out where harvesting losses occur, know how to measure them and decide what reasonable losses are. Machines and operating practices are then set to minimise losses.[6]

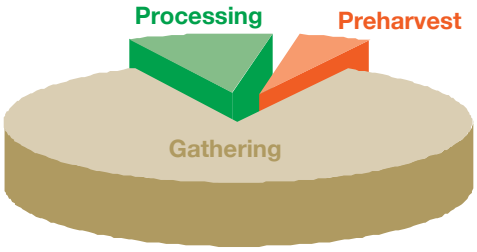

Figure 3: Representation of soybean losses at harvest. Gathering losses can be as high as 85% of all losses in this crop. (Photo: Australian Oilseeds Federation)

12.5.1 How to measure harvest performance

Harvester capacity must be specified at a pre-determined loss level. International standards specify that combine harvester capacity be rated at the 1% processor loss level in both wheat and in soybeans. That does not include gathering losses. Periodically checking for lost soybeans on the ground behind the header is essential to assess the gathering head performance and is essential to calibrate the loss monitors. Monitoring grain loss on the ground does not however tell the whole story. For example, grain that is damaged in the thresher is likely to be blown out the back and unrecoverable. Powdered soybeans don't end up in the grain bin.

The two areas needing closest attention are the gathering area and the processor. It's the gathering area where the most losses occur at harvest in soybeans.

The difference between the 'pristine crop' growing in the paddock and what is in the header bin are the sum of all losses, that is: [7]

Pre harvest + gathering + processor losses

[4] Australian Oilseeds Federation (2013), Better Soybeans manual http://www.australianoilseeds.com/soy_australia/Soybean_Production

[5] Australian Oilseeds Federation (2013), Better Soybeans manual http://www.australianoilseeds.com/soy_australia/Soybean_Production

[6] Australian Oilseeds Federation (2013), Better Soybeans manual http://www.australianoilseeds.com/soy_australia/Soybean_Production

[7] Australian Oilseeds Federation (2013), Better Soybeans manual http://www.australianoilseeds.com/soy_australia/Soybean_Production

Table 1: Targeted loss levels: ideals to maximise soybean harvest performance

Loss	As percent of total yield	As kg/ha in average crop of 2.7 t/ha	As dollars lost per ha for soybeans worth $500/t
Pre Harvest	0.25%	6.75	$3.40
Gathering			
- Shatter loss	2%	54	$27
- Stalk/ cutterbar	*0.5%*	13.5	$6.80
- Lodged loss	0.5%	13.5	$6.80
- Stubble loss	*0.75%*	20.25	$11.25
Processing:			
- Cylinder	*0.25%*	6.8	$3.40
- Separator	*0.5%*	13.5	$6.80
Notional totals	*4.75%*	128.25	$64.13

12.5.2 Pre-harvest losses

It is impossible to step into a mature soybean crop without dislodging a bean or two, so losses from a large harvesting, machine are inevitable. Pre-harvest losses under most conditions should be less than 0.25% of bin yield. The situation changes when soybeans dry to a very low moisture content. Weeds proliferate or vermin inhabit the crop due to delayed harvest.

Pre-harvest losses are not attributable to the harvester; that is, soybean seeds and pods on the ground plus soybeans that decline in quality (mould, etc) due to any harvest delays. Pre-harvest losses are aggravated when harvest is delayed. Soybeans shatter out of pods when they dry out. This is accelerated when wetting and drying cycles occur in the maturing crop. The ideal time to harvest is when the beans reach physiological maturity and reach a safe storable moisture content of 13% (wet basis). However in some situations, there is a case for harvesting early at higher than normal storage moisture and physically drying and aerating the beans in order to minimise pre-harvest losses.

Losses in the gathering zone (commonly referred to as the 'front'): A number of studies have established that around 85% of soybean losses at harvest are due to the gathering head–mostly caused by the cutterbar, but also from the reel and the platform auger. The key point affecting these front-end losses is podding height of the soybean crop.

Agronomic practices affect gathering losses: Podding height is greatly affected by several agronomic factors, such as row spacing and plant population density. Soybeans on very narrow rows (~175 mm) tend to be spindly and pod higher. Whilst superior for harvesting there is also a higher risk of plants lodging in heavy weather. With wide row spacings, soybean plants branch and will grow pods to ground level, which makes it very difficult to get them all into the gathering head. As a general rule, flat ground is better than beds as far gathering losses as are concerned.

Gathering losses chargeable to the machine can be defined as follows:

- Shatter loss: free beans and beans in pods that are detached from the plant.
- Stalk loss: beans in pods still attached to the plant on the stem or on branches but that were not collected by the gathering head (sometimes called cutterbar loss).
- Lodged loss: Beans in pods attached to stalks and branches abnormally longer than the stubble, these are beans, which slipped under the cutterbar.
- Stubble loss: Beans in pods attached to the freestanding stubble left behind the machine.

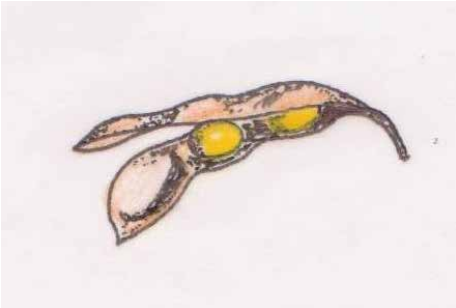

Figure 4: Soybean pods dehisce after maturity - the more so as the crop dries out or if the pods are subject to rewetting and drying. (Photo: Australian Oilseeds Federation)

Paying attention to each of these can be instructive in machine operation to rectify and minimise losses.

Plant varieties that are less shatter-prone and pod higher: There are varietal differences that impact harvest losses. Narrow rows (e.g. ~175 mm rows) promote higher pods and less branching, but are more at risk of lodging.

Weather Influences at Harvest Time: Front loss increases exponentially as field moisture drops below 13%, which is considered safe storage moisture for up to six months. For safe storage over 12 months, soybeans need to be dried to 11% moisture content or lower.[8]

12.5.3 Gathering losses

Gathering losses take place at the front. After the machine has passed through the crop, closely examine the ground behind the wings of the header and look for:

Shatter Loss: Free soybeans and beans in detached pods.

Stalk or Cutterbar Loss: Soybeans in pods still attached to plant stems or branches that are cut but not collected.

Lodged Loss: Soybeans in pods attached to stalks and branches abnormally longer than the stubble. These have slipped under the cutterbar.

Stubble Loss: Soybeans in pods attached to the free-standing stubble left behind the machine.

Stripping Loss: This is standing stalks and branches that have pods attached or popped open that are leaning in the direction of travel–due to travelling too fast, defective knife sections, and/or incorrect reel positioning.[9]

[8] Australian Oilseeds Federation (2013), Better Soybeans manual http://www.australianoilseeds.com/soy_australia/Soybean_Production

[9] Australian Oilseeds Federation (2013), Better Soybeans manual http://www.australianoilseeds.com/soy_australia/Soybean_Production

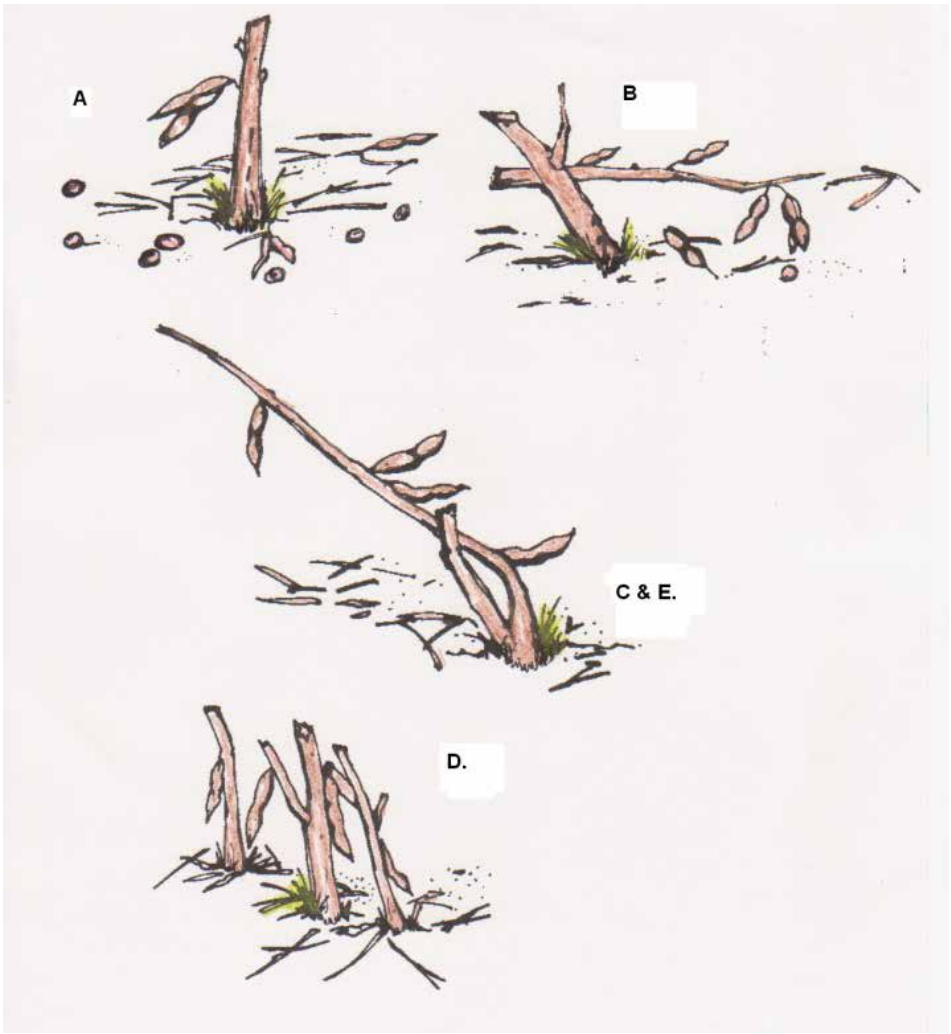

Figure 5: Where to measure losses. After cutting in a uniform area in the crop, the harvester should be backed off a few metres to assess the losses. (Photo: Australian Oilseeds Federation)

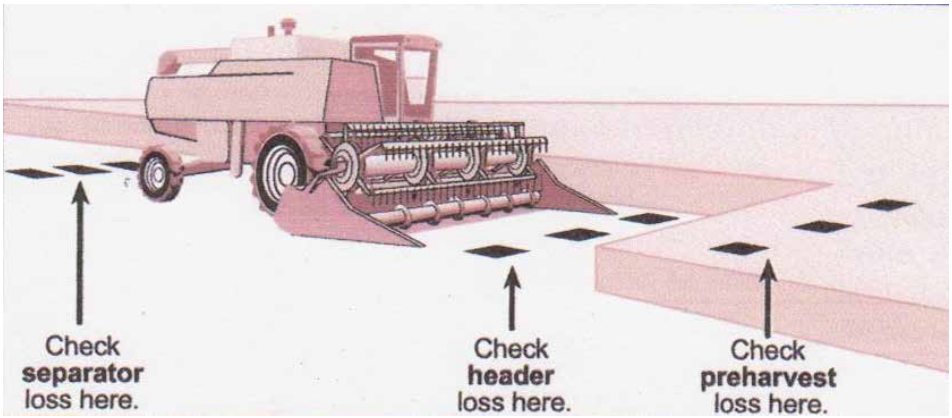

Figure 6: Gathering losses at the front of the machine. (Photo: Australian Oilseeds Federation)

Machine factors: For the best possible harvest job in soybeans, it is essential to harvest with a floating cutterbar for soybeans (known as 'Flex fronts' in John Deere machines). Gathering losses with a floating cutterbar are half that of a rigid platform. Floating the cutterbar on skids close to ground level and independent of the platform enables the sickle to get under as many pods and branches as possible. By contrast, a fixed gathering platform will of necessity pitch and roll with the harvester as it traverses

ground irregularities. Maintaining a consistent low cutting height across the width of the front is impossible with a rigid platform. Admittedly, an auto height controller will reduce fixed platform gathering losses however cutting height control is also highly desirable with a floating cutterbar.

Floating the cutterbar not only permits faster forward speed for the same loss level but also minimises stones entering the platform, as do rock interrupting attachments. Rock barriers that mount behind the cutterbar are an optional attachment.

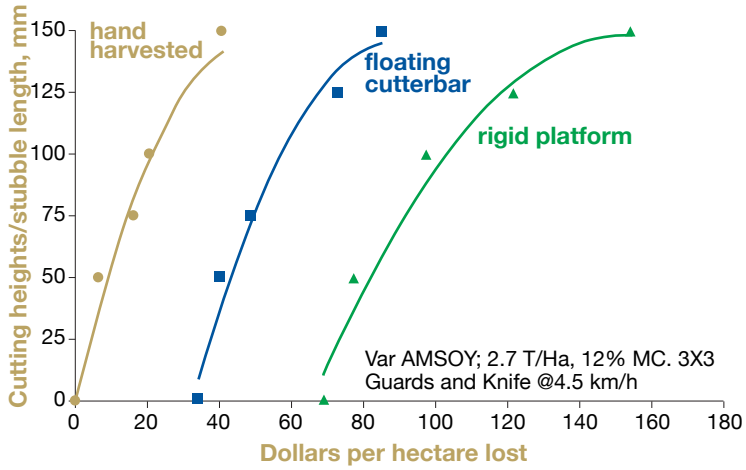

Figure 7: The influence of stubble length/cutting height on soybean gathering losses for a rigid front versus a floating cutterbar, compared with manually harvested quadrats. This data shows that a rigid platform has double the losses of a floating cutterbar, but it is obviously location-and variety-specific, so the actual numbers would not apply elsewhere. The two fronts were operated in a paired comparison on combines travelling at 4.5 km/hr in variety Amsoy. (Photo: Australian Oilseeds Federation)

Alternative cutterbar configurations. A narrow-pitched knife (e.g. Kwik-Cut or Tiger Jaws models) significantly reduces front loss in soybeans compared with the standard 3-inch sickle sections X 3-inch guards. This is mainly due to less stem movement during cutting.

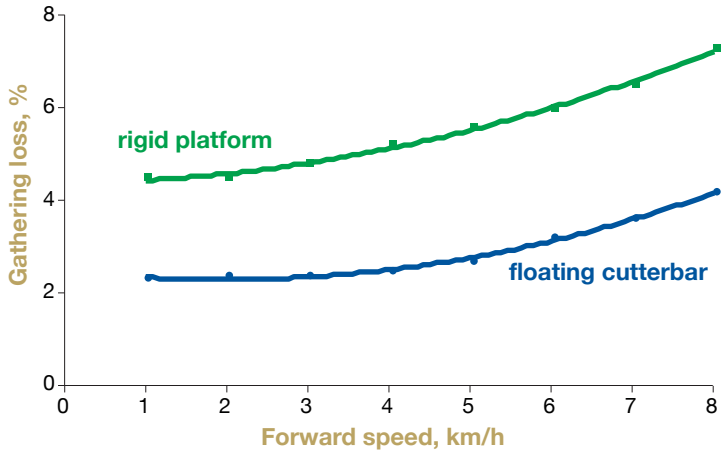

Figure 8: Influence of forward speed on gathering loss in 2.4 t/ha variety Hardome at 12.5% moisture content. Both platforms equipped with 3 X 3 cutterbars. (Photo: Australian Oilseeds Federation)

A pickup reel is a must. The 'feathering' pickup reel is best for soybeans–the reel tines enter the crop vertically for least disturbance and gently sweep the crop over the cutterbar and into the auger. A bat reel is cheaper but will shatter too many beans. Reel index (ratio of reel tip speed to forward speed) should be maintained around 1.25, which means that reel speed needs to be changed any time combine speed changes. That is

readily accomplished with auto reel speed control on the combine. Reel position and tine pitch need to match to crop conditions.

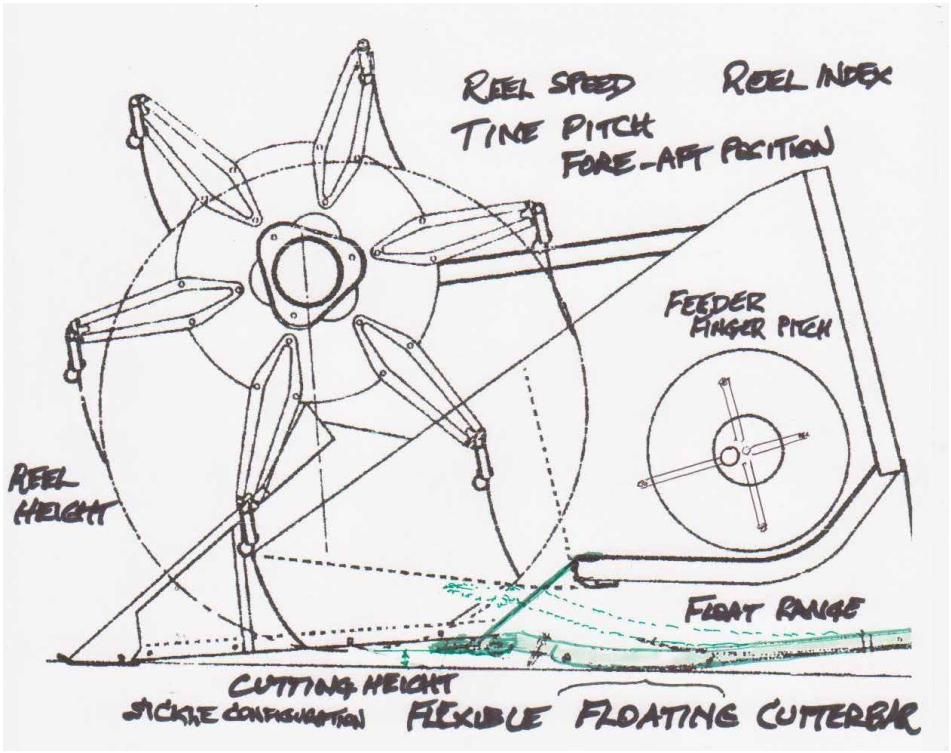

Figure 9: Critical platform adjustments. This shows an after-market floating cutterbar. (Photo: Australian Oilseeds Federation)

Some makers (Deere and Claas) offer a variable-width platform, which is desirable in short crops to minimise the "Dead Zone" where the reel tines sweep over the platform and lift just ahead of the auger.[10]

12.5.4 Processor losses

The throughput of a combine harvester can be no greater than what the gathering head can digest. That fact reinforces the importance of optimising gathering front settings for high capacity at minimal loss.

Soybeans are comparatively easy to thresh and separate. Green stems result in heavy slugging and 'roping' in the processor. Processor performance is best with smooth/even crop feeding. However, in paddock conditions with a high yield crop that has green stringy stems and green weeds present, "lumpy"/uneven feeding and less-efficient threshing occurs. A draper type head provides smoother flow and more crop feeding into the processor heads-first.

The processor shells the pods and should do that without causing excessive damage and splits. The cleaning system should remove weed seeds and foreign matter in the bin sample. The art is to balance a complete thresh against gentle threshing using the appropriate processor (rotor or cylinder) speed. Monitoring the tailings return to check whether it is grain-rich or chaff-rich is one gauge of thresher performance. Obviously the operator's manual is the appropriate place to start for any given machine's settings.

For soybeans the rotor or cylinder needs to be running at a peripheral speed of around 18 m/sec (3,500 ft/min). For a 760 mm (30 inch) rotor diameter, as on a Deere STS or Case-IH 9020 for example, that means a rotational speed of around 450 rpm. Round

[10] Australian Oilseeds Federation (2013), Better Soybeans manual http://www.australianoilseeds.com/soy_australia/Soybean_Production

concave bars are gentler than rectangular bars. Removal of concave wires may be desirable to allow seeds to escape early through the concave in soy.

Grain damage increases with rotor or cylinder speed squared. Seed damage also increases with moistures over 14%.

Figure 10: Threshing rotor 'out to get' a soybean pod! Threshing is a combination of impact, pinching and shearing. There is least seed damage when there is a cushion of crop in the processor. Thresher speed needs to be kept as low as possible consistent with thorough pod shelling. (Photo: Australian Oilseeds Federation)

Minimising losses from the cleaning shoe: Remove any perforated screens under elevator doors, cross augers or under the unloading auger tube in soybeans. Open the chaffer (upper sieve) wide enough (e.g. 5/8 inch or 16 mm) to prevent clean soybeans being carried on to the returns system, likewise, the lower sieve should be set initially at say 3/8 inch or 10 mm.

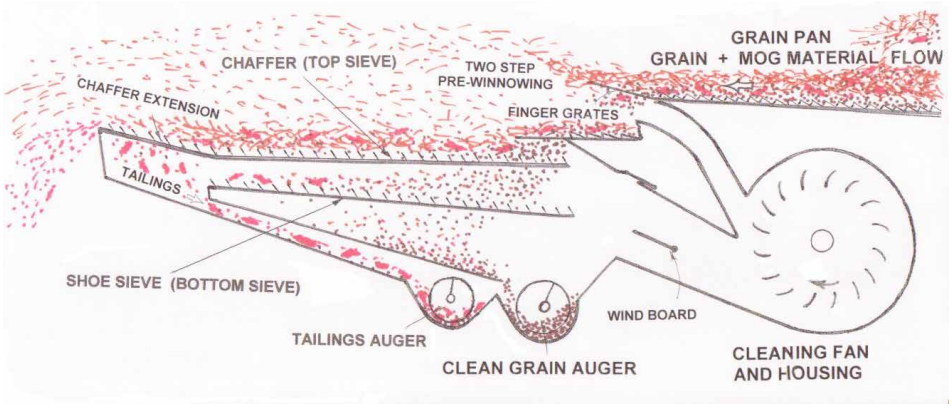

Figure 11: Cross-section of a representative combine cleaning shoe. Comprehending crop flow here helps with settings for best performance. Engine speed needs to be maintained for consistent shoe performance. If the cleaning system speed (including the fan) slows, shoe losses escalate. Examination of the tailings return flow tells much about shoe performance. (Photo: Australian Oilseeds Federation)

Adjust only one setting at a time: An under-loaded machine will cause more seed damage, so too will worn components that have been chrome plated to expose sharp edges. Harvesting machines are designed to operate best when engine speed is maintained–the cleaning shoe in particular is quickly affected if the engine slows.

Making only one adjustment at a time gives the operator a better idea of where performance can be improved.[11]

Table 2: The importance of operator skill level–eg. For three operator skill levels in an average soybean rield of 2.7 t/ha with soybeans at $500/t

	Total losses, %	Harvest rate, ha/h	Cost of those losses $/ha	Gain over mug operator, $/ hour	Loss over a top gun $/hour
'Inexperienced'	10%	5	135	-	523.2
'Average'	5%	5	67.50	185.7	185.7
'Top operator'	2.25%	5	30.4	523.2	-

12.6 Bin sample quality

What's up in the bin - measuring sample quality: The receival centre test for sample quality usually involves passing a sub-sample through a 10/64 X 3/4 inch screen. The sample is visually tested for discernible damage, brokens and splits, foreign material, and weed seeds. Test weight diminishes when seed damage is excessive.

Grower payment is conditional on total delivered, on moisture content, on test weight and on seed sample quality and purity.

How much do losses cost? Crop return, and the value of the harvest or cost of losses is calculated simply as:

Dollars per hectare = Dollars per tonne X Tonnes per hectare.

12.7 Handy hints

Most losses occur at the front in soybeans: Focus on the front. About 85% of soybean losses take place at the front. And they start at the cutterbar. The cutterbar must get under the lowest pods and branches.

Floating cutterbars: For best results harvesting soybeans, a floating cutterbar/flex front is essential. If not already installed, these may be bought as an aftermarket attachment. For small grain harvest the flexible floating cutterbar can be locked up like a rigid front. Narrow sickle sections are better than the standard 3 X 3 guards and sections in soybeans. An air reel and a Vibramat are worth the extra in short and light crops. The key to reduced losses is to minimise stem movement at the sickle.

Auto Height Controller: Height controllers and height indicators are invaluable if fitted, not only to maintain low cutting but also to minimise the risk of gouging and picking up dirt.

Pickup Reels: Do not harvest soybeans with a bat reel as they result in significantly higher losses than feathering pickup reels. There are reel options available for soybeans too, such as the Orbit reel, paddle fingers and extra-large diameter model reels.

A rigid cutterbar: If using a rigid platform it needs to be operated dead level with (and low to) the ground. Significant crop losses will occur if one end is in the air and the other is in gouging the dirt. Lateral height controllers on the platform are particularly useful with wide fronts if you have to use a rigid platform.

Platform auger: Set the platform auger so there is about 18 mm clearance between the flighting and the bottom sheet of the platform. Also check that the retractable fingers

[11] Australian Oilseeds Federation (2013), Better Soybeans manual http://www.australianoilseeds.com/soy_australia/Soybean_Production

are timed according to the manual. That will facilitate more uniform feeding into the front elevator.

Flat ground: Flat ground is better than ridged-up beans. Narrow rows also facilitate the harvest as plants tend to pod higher and branch out less. At all times the aim is to get below the low pods.

Draper fronts feed better than an auger front: This improves processor performance, however draper heads do not normally come with a floating cutterbar. Some manufacturers now offer this as a combination. Ideally, this is the best harvesting setup. Uniform crop feeding of crop (minimum bunching) is important for best thresher/separator performance. There is a tendency for auger ('tin') fronts to feed in bunches in lighter crops and in weedy conditions. Draper fronts feed better and can increase combine capacity.

Many of these sources of loss can be reduced by due care with the cutterbar and reel. Combine forward speed should not be excessive. Travelling too fast results in higher or ragged stubble.

Check condition of cutterbar: Knife sections need to be intact and sharp, the knife needs to be in register, with hold-down clips correctly set. Knife condition is crucial in soybeans.

Alternative cutterbar configurations: A narrow-pitched knife (example Kwik-Cut or Tiger Jaws models) significantly reduces front loss in soybeans compared with the standard 3-inch sickle sections X 3-inch guards. This is mainly due to less stem movement during cutting.

Reel speed and position critical. The reel needs to be run around 25% faster than the forward speed and be adjusted for height and forward position to match the crop. In addition, reel tine pitch needs to be near vertical or else teeth tilted back towards the cutterbar if the crop is lodged.

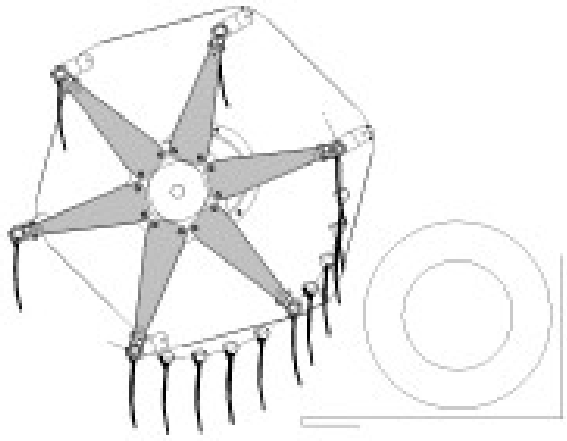

Figure 12: Note that a pickup reel enters and leaves the crop vertically for least stem disturbance. The reel should be positioned to sweep the crop over the platform into the auger or onto the draper. (Photo: Australian Oilseeds Federation)

Minimising processor losses: Start with the operator's handbook settings for drum speed, concave openings, vane angles, fan speed and sieve settings. If crop conditions demand a change–change only one setting at a time and note the difference. Thresher speed, for example, should be slowed to the point where damage and splits are acceptable but at the same time maintaining acceptable threshing losses (very few intact pods in the sample). Operate to maintain a cushion of crop in the processor for least damage to soybeans. When unloading, slow the engine to reduce seed damage by the unloading auger. Where possible, use belt conveyors and avoid augers when moving soybeans around the farm.

Calibrate the loss monitors: Loss monitors only measure relative loss and need periodic calibration. They do a good job of indicating relative performance. This means an operator must periodically assess losses on the ground.

Monitor tailings returns: Check tailings returns regularly to see whether that flow is grain-rich or chaff-rich. Alter sieve settings to match the indication from the tailings flow.

Assess grain sample for foreign matter. Foreign matter is affected by crop and harvester settings.

Engine speed: The engine needs to be operated at rated speed at all times during harvest for consistent performance. A slowing engine will quickly affect the cleaning system first. If cleaning system speed slows (especially fan and shoe shake), shoe losses escalate. In the worst case a slowing engine can lead to plugging. Watch the power monitor if fitted.

Kill-stop: Performing a kill-stop or plug-stop is for trained operators only but is valuable to indicate performance of various processor components of the machine. See manual for procedure and follow those steps exactly, otherwise engine damage or operator accidents can occur.[12]

12.7.1 How to measure losses

Total Loss = Pre-Harvest Loss + Gathering Losses + Processor losses

(Usually expressed as a percent of total yield, which in turn is bin yield plus losses–it can also be expressed and more conveniently as percent of bin yield, if field losses aren't exorbitant). Table 1 gives some notional numbers for acceptable losses, and what the losses will cost.

The trick is to use several sampling frames randomly placed in a uniform part of the crop and behind the machine. Get down on the ground and count beans inside the frame(s). In simplest terms, four beans in a frame on the ground in 1/10th m^2 (say 32 cm X 32 cm) frame area represents 76 kg/ha loss.

In reality, isolating processor losses from gathering losses measured behind the harvester is a lot more complicated and requires that the chaff spreader(s) and straw chopper be disconnected, as well as accounting for pre-harvest loss. On the latest combines those are difficult or impossible to disconnect and keep running without plugging the machine![13]

Figure 13: The effluent chaff and the straw need to be spread as wide as the gathering front to facilitate subsequent field operations and eliminate header trails. Bunched material post harvest may interfere with the seeding operation of the following crop. (Photo: AustralianOilseeds Federation)

12.7.2 Buying a Harvester

There are two categories of harvesters in Australia: rotary versus hybrid and walker type, in a range of sizes. All models are imported. They come in six primary colours: (in order

[12] Australian Oilseeds Federation (2013), Better Soybeans manual http://www.australianoilseeds.com/soy_australia/Soybean_Production

[13] Australian Oilseeds Federation (2013), Better Soybeans manual http://www.australianoilseeds.com/soy_australia/Soybean_Production

of sales numbers) Case IH, Deere, New Holland, Claas - and AGCO with two brands (MF and Gleaner). Rotary harvesters dominate the market but there are still many walker types in use for soybeans - older machines that tie up far less capital. Rotaries generally do less damage and are more forgiving for processor settings, but a skilled operator can still achieve a high quality job with a walker-type machine, as long as it has a floating cutterbar front.

Alternatives to owning: What are the options? If a grower has a small area of soybeans or otherwise can't afford to tie up capital in a combine the options are: to bring in a contractor (is a contractor available on time?), share ownership, or lease a machine. [14]

12.8 Wet harvest issues and management

The only limitation to growing soybeans in a double cropping system is the risk of a wet harvest for both the winter and summer crops. This can delay harvest and the planting of the next crop. But that's not just a problem for soybeans, it's for all summer crops. (Southern NSW)

Agronomist's view

More information

Grain Trade Australia Trading Standards

12.9 Receival standards

Soybean quality standards: Soybean delivery standards are different according to end-use; processing, culinary, seed beans and forage soybeans. Receival standards are readily available.

More information

North Coast NSW Planting Guide

12.10 Harvest weed seed management

The use of perennial pasture leys can reduce weed seed levels in the soil and restore soil structure. high density, warm-season forage crops can be used to smother weeds. slashing after grazing can prevent weeds from producing seed.[15]

[14] Australian Oilseeds Federation (2013), Better Soybeans manual http://www.australianoilseeds.com/soy_australia/Soybean_Production

[15] Australian Oilseed Federation, Soybean North Coast NSW Planting guide http://www.australianoilseeds.com/__data/assets/pdf_file/0020/7670/Soybean_North_Coast_NSW_Planting_Guide.pdf