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Mungbean Harvest Losses

Trial ID: LB2030 **Location:** Dulacca **Trial Year:** 2021
Investigator: Linda Bailey

High levels of grain loss are common when harvesting mungbeans. Combined with high grain prices, harvest losses of more than \$100/ha can easily occur. Losses can occur at a number of points in the harvest process but this project was mainly focussed on those that occur at the front of the header rather than losses within the header 'processing'. The front of header losses may be due to pods falling off at harvest, pods shattering at harvest or plant and pod material feeding poorly into the elevator. In addition, yield losses due to low harvest height are common, particularly in undulating country or with short or lodged plants.

This project aimed to quantify the level of grain loss under commercial conditions and also the impact of management changes to reduce those losses. This trial evaluated the impact of air assist on grain losses from an AWS air bar mounted on a John Deere 640D draper front.

Objective:	To evaluate the impact of header front adaptation on mungbean grain loss at harvest
Crop & Variety:	Mungbean cv. Opal AU
Row Spacing:	50 cm
Harvest Date:	09/04/2021 (8 days after desiccation)
Crop Yield:	2.2 t/ha
Header Front:	John Deere 640D HydraFloat Draper (rigid)
Ground Speed:	7 km/hr
Airbars:	AWS
Trial Design:	Randomized complete block with 8 replicates
Plot Size:	12 m x 40 m
Keywords:	Harvest losses, mungbean

Crop desiccation was conducted on the 1/04/2021. Harvest occurred 8 days later with grain loss assessments conducted 3 days after harvest.

Crop Name Crop Variety Description Assessment Date Assessment Type Assessment Unit Sample Area Evaluation Interval ARM Action Codes		Mungbean Opal AU			
		Pods Attached to Plants 12/04/2021 GRAIN WEIGHT kg/ha 5 x 1m row 3 DAH AS	Pods on Ground 12/04/2021 GRAIN WEIGHT kg/ha 5 x 1m row 3 DAH	Grain on Ground 12/04/2021 GRAIN WEIGHT kg/ha 5 x 1m row 3 DAH AL	Total Grain Loss 12/04/2021 GRAIN WEIGHT kg/ha 5 x 1m row 3 DAH
Trt No.	Treatment				
1	Airbar - Off	47-	120-	52a	228-
2	Airbar - On	45-	92-	39b	185-
	LSD P=.05	nsd	nsd	0.09t	nsd
	Treatment Prob.(F)=	0.7534	0.1224	0.0159	0.1048

Means followed by same letter do not significantly differ (P=.05, LSD)

t=Mean descriptions are reported in transformed data units, and are not de-transformed.

Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.

nsd = no significant difference

Grain and pod counts were conducted away from the centre of the header trail. This was done to avoid any grain losses that were caused by header 'processing'.

NB: 50 pods assessed - mean 8.8 grains/ pod, grain weight 7.4 g/ 100 grains

ARM Action Codes

AS = Automatic square root transformation of X+0.5

AL = Automatic log transformation of X+1

DAH = Days after Harvest

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Conclusions:

This trial was designed to evaluate the impact of header front adaptations on mungbean grain loss at harvest. It was conducted in a crop of Opal AU (on 50 cm row spacing) with a harvested yield of ~2.2 t/ha. The crop was harvested 8 days after desiccation.

A John Deere 640D HydraFloat Draper (rigid), fitted with an AWS Airbar, harvested the trial at a ground speed of ~7 km/h. The trial compared the impact of air assist on mungbean grain loss.

Counts of pods and individual grain on the ground were assessed 3 days after harvest. 50 random pods were also assessed to calculate grains/pod and grain weight.

Total harvest grain losses were ~230 kg/ha. At a price of \$1,000/t, this represented a financial impact of ~\$230/ha. The grain losses consisted of ~120 kg/ha as pods on the ground, ~50 kg/ha as individual grains on the ground and ~45 kg/ha of pods still attached to plants. The use of air assist in this situation had no impact on pod loss on the ground, pods still attached to plants or the total grain loss despite a 13 kg/ha reduction in individual grain loss on the ground.

In this situation, a potential crop yield of ~2.4 t/ha was reduced by ~0.2 t/ha in grain losses at the front of the header during harvest.

Crop Description	
Crop:	Mungbean cv. Opal AU
Harvest Date:	9/04/2021
Harvested Width:	12m
Harvested Length:	40m
Harvest Equipment:	JD HydraFloat

Rainfall:

Closest Weather Station:	SIL0 grid pt 26.60S, 149.75E
Distance, Unit:	1km

Date	Amount	Unit	
1/04/2021	-	mm	Desiccation
6/04/2021	6.1	mm	
7/04/2021	0.7	mm	
9/04/2021	-	mm	Harvest
12/04/2021	-	mm	Assessment