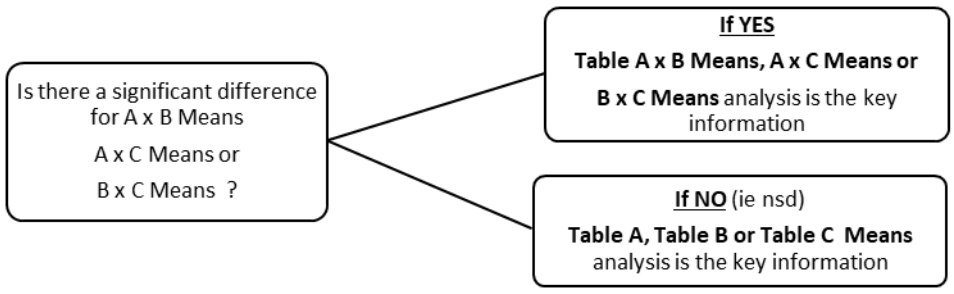
Chickpea Desiccation Timing

Trial ID: LB1809 **Location:** Warra **Trial Year:** 2018
Investigator: Linda Bailey

Objective:	**To evaluate the impact of harvest management on chickpea yield and harvest losses**		
Crop:	**Chickpea cv PBA Seamer**		
Planting Date:	**27/05/2018**		
Planting Equipment:	**Tyne Planter**		
Planting Rate:	**68kg/ha**		
Row Spacing:	**50cm**		
Application Code:	**A**	**B**	**C**
Application Date:	**19/10/2018**	**2/11/2018**	**9/11/2018**
Application Timing:	**27 Days prior to harvest**	**14 Days prior to harvest**	**7 Days prior to harvest**
Crop Stage at Application:	**52% of Pods physiologically mature**	**85% of Pods physiologically mature**	**90% of Pods physiologically mature**
Harvest Timings:	**H1 (Planned Harvest) : 16/11/2018, H2 Delayed Harvest: (30/11/2018)**		
Keywords:	**Chickpea, desiccant**		

Trial designed and analysed as a Factorial

	In Simple Terms
Table of A Means:	Mean of 'Desiccant' performance with **ALL** 'Desiccant Timing' treatments and 'Harvest Timing' treatments
Table of B Means:	Mean of 'Desiccant Timing' performance with **ALL** 'Desiccant' treatments and 'Harvest Timing' treatments
Table of C Means:	Mean of 'Harvest Timing' performance with **ALL**'Desiccant' treatments and 'Desiccant Timing' treatments
Table of A x B Means:	'Desiccant' performance with **EACH** 'Desiccant Timing' treatment
Table of A x C Means:	'Desiccant' performance with **EACH** 'Harvest Timing' treatment
Table of B x C Means:	'Desiccant Timing' performance with **EACH** 'Harvest Timing' treatment



Significant results highlighted in grey for each assessment

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Table 1 – Yield and grain loss at front of header

NB: No statistical interactions so only main effects shown

Crop Name / Crop Variety				Chickpea PBA Seamer	
Assessment Date				H1: 16/11/2018 H2: 30/11/2018	04/12/2018
Description					Header Front Loss
Assessment Type				YIELD	COUNT
Assessment Unit				t/ha	Grains/m²
ARM Action Codes					AS
Trt No.	**Treatment**	**Product Rate**	**Appln. Code**		
TABLE OF A MEANS (Desiccant)					
1	Untreated	-		1.08-	147t-
2	Weedmaster Argo	1800ml/ha		1.08-	125t-
3	Weedmaster Argo Ally	1100ml/ha 5g/ha		1.12-	131t-
4	Sharpen Hasten	34g/ha 1% v/v		1.13-	183t-
5	Gramoxone	800ml/ha		1.05-	133t-
6	Reglone Chemwet 1000	3000ml/ha 0.2% v/v		1.01-	137t-
TABLE OF B MEANS (Desiccant Timing)					
1	4 Weeks Pre-harvest		A	1.03b	156t-
2	2 Weeks Pre-harvest		B	1.08ab	133t-
3	1 Week Pre-harvest		C	1.13a	138t-
TABLE OF C MEANS (Harvest Timing)					
1	Planned Harvest		H1	1.01b	123tb
2	Delayed Harvest		H2	1.15a	163ta

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

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Table 2 – Grain Quality

NB: Interaction only for Test Weight

Crop Name / Crop Variety				Chickpea PBA Seamer			
Assessment Date				H1: 29/11/2018 H2: 5/12/2018	H1: 29/11/2018 H2: 5/12/2018	H1: 29/11/2018 H2: 5/12/2018	H1: 29/11/2018 H2: 5/12/2018
Assessment Type				PROTEIN	MOISTURE	TEST WEIGHT	SCREENING
Assessment Unit				%	%	kg/hL	%
ARM Action Codes							AL
Trt No.	Treatment	Product Rate	Appln. Code				
TABLE OF A MEANS (Desiccant)							
1	Untreated	-		22.5-	9.6ab	72.8a	7.9t-
2	Weedmaster Argo	1800ml/ha		22.6-	9.6ab	72.8a	9.3t-
3	Weedmaster Argo Ally	1100ml/ha 5g/ha		22.6-	9.4b	72.6a	8.8t-
4	Sharpen Hasten	34g/ha 1% v/v		22.6-	9.7a	72.7a	8.7t-
5	Gramoxone	800ml/ha		22.4-	9.8a	71.4b	9.5t-
6	Reglone Chemwet 1000	3000ml/ha 0.2% v/v		22.6-	9.6ab	72.2a	8.7t-
TABLE OF B MEANS (Desiccant Timing)							
1	4 Weeks Pre-harvest		A	22.4-	9.6-	71.9b	9.2ta
2	2 Weeks Pre-harvest		B	22.6-	9.7-	72.7a	9.3ta
3	1 Week Pre-harvest		C	22.5-	9.6-	72.7a	8.0tb
TABLE OF C MEANS (Harvest Timing)							
1	Planned Harvest		H1	22.7a	9.7a	73.3a	5.9tb
2	Delayed Harvest		H2	22.4b	9.5b	71.5b	13.0ta
TABLE OF A x B MEANS (Desiccant x Desiccant Timing)							
1	Untreated		A	22.4-	9.6-	72.8ab	8.0t-
2	Weedmaster Argo	1800ml/ha	A	22.7-	9.6-	72.6ab	9.5t-
3	Weedmaster Argo Ally	1100ml/ha 5g/ha	A	22.6-	9.4-	72.5ab	9.7t-
4	Sharpen Hasten	34g/ha 1% v/v	A	22.5-	9.8-	72.6ab	9.0t-
5	Gramoxone	800ml/ha	A	22.2-	9.7-	69.9d	9.4t-
6	Reglone Chemwet 1000	3000ml/ha 0.2% v/v	A	22.3-	9.6-	71.0cd	9.6t-
1b	Untreated		B	22.7-	9.7-	72.8ab	7.9t-
2b	Weedmaster Argo	1800ml/ha	B	22.5-	9.7-	73.5a	9.9t-
3b	Weedmaster Argo Ally	1100ml/ha 5g/ha	B	22.8-	9.5-	72.5ab	8.9t-
4b	Sharpen Hasten	34g/ha 1% v/v	B	22.6-	9.6-	72.7ab	10.2t-
5b	Gramoxone	800ml/ha	B	22.4-	9.9-	71.9bc	11.0t-
6b	Reglone Chemwet 1000	3000ml/ha 0.2% v/v	B	22.7-	9.7-	72.7ab	8.4t-
1c	Untreated		C	22.4-	9.7-	73.0ab	7.7t-
2c	Weedmaster Argo	1800ml/ha	C	22.6-	9.6-	72.4ab	8.7t-
3c	Weedmaster Argo Ally	1100ml/ha 5g/ha	C	22.5-	9.4-	72.9ab	7.8t-
4c	Sharpen Hasten	34g/ha 1% v/v	C	22.6-	9.6-	72.7ab	7.2t-
5c	Gramoxone	800ml/ha	C	22.5-	9.7-	72.3ab	8.4t-
6c	Reglone Chemwet 1000	3000ml/ha 0.2% v/v	C	22.7-	9.6-	72.8ab	8.3t-

Chickpea Desiccation Timing

Trial ID: LB1809 **Location:** Warra **Trial Year:** 2018

FACTORIAL/POOLED ERROR AOV
Chickpea cv. PBA Seamer
16/11/2018 and 30/11/2018
YIELD t/ha TY

Source	DF	Sum of Squares	Mean Square	F	Prob.(F)	LSD (.05)
Total	140	7.813934				
R	3	2.976479	0.992160	36.762	0.0001	
A	5	0.236689	0.047338	1.754	0.1291	0.09
B	2	0.220387	0.110193	4.083	0.0197	0.07
AB	10	0.272981	0.027298	1.011	0.4391	0.16
C	1	0.647726	0.647726	24.000	0.0001	0.05
AC	5	0.270477	0.054095	2.004	0.0842	0.13
BC	2	0.034294	0.017147	0.635	0.5318	0.09
ABC	10	0.402079	0.040208	1.490	0.1539	0.23
ERROR	102	2.752824	0.026988			

FACTORIAL/POOLED ERROR AOV
Chickpea cv. PBA Seamer
Header Front Loss Grain
4/12/2018
COUNT /m² 46 DAA AS T17

Source	DF	Sum of Squares	Mean Square	F	Prob.(F)	LSD (.05)
Total	140	1764.023534				
R	3	64.056099	21.352033	1.945	0.1271	
A	5	86.543223	17.308645	1.577	0.1733	2
B	2	25.095443	12.547722	1.143	0.3229	1
AB	10	157.327363	15.732736	1.433	0.1764	3
C	1	99.419810	99.419810	9.056	0.0033	1
AC	5	27.229046	5.445809	0.496	0.7785	3
BC	2	6.927063	3.463532	0.315	0.7301	2
ABC	10	177.663030	17.766303	1.618	0.1118	5
ERROR	102	1119.762457	10.978063			

FACTORIAL/POOLED ERROR AOV
Chickpea cv. PBA Seamer
29/11/2018
PROTEIN %

Source	DF	Sum of Squares	Mean Square	F	Prob.(F)	LSD (.05)
Total	140	23.734300				
R	3	0.797310	0.265770	1.981	0.1215	
A	5	0.846985	0.169397	1.263	0.2859	0.2
B	2	0.777041	0.388521	2.896	0.0598	0.1
AB	10	1.556667	0.155667	1.160	0.3263	0.4
C	1	3.968336	3.968336	29.580	0.0001	0.1
AC	5	0.716752	0.143350	1.069	0.3823	0.3
BC	2	0.109389	0.054695	0.408	0.6663	0.2
ABC	10	1.277757	0.127776	0.952	0.4894	0.5
ERROR	102	13.684064	0.134157			

Chickpea Desiccation Timing 2018

Trial ID: LB1809 **Location:** Warra **Trial Year:** 2018

FACTORIAL/POOLED ERROR AOV
Chickpea cv. PBA Seamer
29/11/2018 and 5/12/2018
MOISTURE %

Source	DF	Sum of Squares	Mean Square	F	Prob.(F)	LSD (.05)
Total	140	15.833923				
R	3	0.145445	0.048482	0.445	0.7212	
A	5	1.392556	0.278511	2.558	0.0319	0.2
B	2	0.152263	0.076132	0.699	0.4994	0.1
AB	10	0.392730	0.039273	0.361	0.9606	0.3
C	1	0.709226	0.709226	6.513	0.0122	0.1
AC	5	0.688770	0.137754	1.265	0.2848	0.3
BC	2	0.121740	0.060870	0.559	0.5735	0.2
ABC	10	1.124087	0.112409	1.032	0.4221	0.5
ERROR	102	11.107106	0.108893			

FACTORIAL/POOLED ERROR AOV
Chickpea cv. PBA Seamer
29/11/2018 and 5/12/2018
TEST WEIGHT kg/hL

Source	DF	Sum of Squares	Mean Square	F	Prob.(F)	LSD (.05)
Total	140	384.730551				
R	3	8.095965	2.698655	1.780	0.1557	
A	5	39.274810	7.854962	5.181	0.0003	0.7
B	2	18.959476	9.479738	6.252	0.0027	0.5
AB	10	30.968698	3.096870	2.043	0.0363	1.2
C	1	106.939446	106.939446	70.531	0.0001	0.4
AC	5	14.671432	2.934286	1.935	0.0949	1.0
BC	2	0.233694	0.116847	0.077	0.9259	0.7
ABC	10	10.934558	1.093456	0.721	0.7029	1.7
ERROR	102	154.652471	1.516201			

FACTORIAL/POOLED ERROR AOV
Chickpea cv. PBA Seamer
29/11/2018 and 5/12/2018
SCREENING % AL

Source	DF	Sum of Squares	Mean Square	F	Prob.(F)	LSD (.05)
Total	140	4.710261				
R	3	0.129428	0.043143	5.532	0.0015	
A	5	0.082086	0.016417	2.105	0.0708	0.1
B	2	0.102829	0.051415	6.592	0.0020	0.0
AB	10	0.071508	0.007151	0.917	0.5209	0.1
C	1	3.470712	3.470712	445.010	0.0001	0.0
AC	5	0.014514	0.002903	0.372	0.8667	0.1
BC	2	0.008809	0.004405	0.565	0.5703	0.1
ABC	10	0.034858	0.003486	0.447	0.9195	0.1
ERROR	102	0.795517	0.007799			

Chickpea Desiccation Timing

Trial ID: **LB1809** **Location:** **Warra** **Trial Year:** **2018**

ARM Action Codes
AA = Automatic arcsine square root % transformation
AL = Automatic log transformation of X+1
AS = Automatic square root transformation of X+0.5

Objectives:

To evaluate the impact of harvest management on chickpea yield and harvest losses.

Conclusions:

Desiccants were applied to chickpeas cv. PBA Seamer at three maturity timings; 4 weeks (~52% maturity), 2 weeks (~85% maturity) and 1 week (~90% maturity) prior to expected commercial or planned harvest. In addition the impact of delaying harvest by an additional 14 days was examined. Burndown, yield and grain quality were assessed, however, the main focus of the study was impact on yield from desiccation application timings and the impact from the harvest delay.

Differences in % burndown between desiccant treatments were relatively minor but confounded by variability in crop maturity. No data is presented.

There were no significant differences in yield between the Untreated and any product but application timing and harvest timing did have a significant yield impact. Desiccants applied at ~52% maturity reduced grain yield by 9% compared to timing at 90% grain maturity. The delayed harvest recorded an increase in yield compared to the planned harvest (~11% increase). However this was believed to be due to improved small plot header set up for harvest 2 rather than an agronomic benefit.

Application timing had an impact on grain quality measurements with application of either Gramoxone or Reglone at 52% maturity, significantly reduced test weight (decreased by 2-3 kg/hL). In addition there was a small (but significant) increase in screenings from early application. .

Harvest timing significantly impacted on all aspects of grain quality. Grain quality at the delayed harvest was significantly lower in moisture, test weight and protein, although the magnitude of difference was generally small. The most obvious impact was a large increase in screenings (4mm sieve) when harvest was delayed. Screenings increased from ~6 to 13%.

There was no shattering loss of grain or pod drop prior to either harvest. An assessment of harvest loss was conducted; counting individual grain, pods and splits under the header (Header Front Loss). Delayed harvest resulted in an additional front of header loss of ~44 grain/m2 (~88 kg/ha).

Crop Description	
Crop:	**Chickpea**
Variety:	**PBA Seamer**
Planting Date:	**27/05/2018**
Planting Rate, Unit:	**68 kg/ha**
Planting Depth, Unit:	**13 cm**
Planting Method:	**Direct Drilled**
Planting Equipment:	**Tyne Planter**
Row Spacing, Unit:	**50 cm**
Harvest Dates:	**16/11/2018 and 30/11/2018**
Harvested Width, Unit:	**1.8 m**
Harvested Length, Unit:	**10 m**

Chickpea Desiccation Timing

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Application Description			
	A	B	C
Application Date:	19/10/2018	2/11/2018	9/11/2018
Application Start Time:	2:15 PM	11:30 AM	2:00 PM
Application Stop Time:	3:30 PM	2:15 PM	3:30 PM
Application Method:	SPRAY		
Application Timing:	PRE-HARVEST		
Air Temperature, Unit:	28 C	29 C	29 C
% Relative Humidity:	52	40	34
Wind Velocity, Unit:	8 km/h	6 km/h	5.5 km/h
Wind Direction:	E		
Dew Presence (Y/N):	No		
Soil Moisture:	SLIWET	DRY	DRY
% Cloud Cover:	80	0	0
Next Moisture Occurred On:	8/11/2018	8/11/2018	18/11/2018

Crop Stage at Each Application			
	A	B	C
Crop:	Chickpea		
Stage Scale Used:	GRDC	GRDC	GRDC
Stage Majority, Percent:	16 R9	18 R11	19 R12
% Pods Physiologically Mature:	52%	85%	90%
Height, Unit:	35 cm	35 cm	35 cm

Application Equipment			
	A	B	C
Application Equipment:	Quad Bike	Polaris	Polaris
Equipment Type:	Boom	Boom	Boom
Operation Pressure, Unit:	350 kPa	300 kPa	300 kPa
Nozzle Type:	AIXR		
Nozzle Size:	110015		
Nozzle Spacing, Unit:	50 cm		
Nozzles/Row:	8		
Boom Length, Unit:	4 m		
Boom Height, Unit:	80 cm		
Ground Speed, Unit:	7.2 km/h		
Carrier:	Water		
Spray Volume, Unit:	100 L/ha		