

THE EFFECT OF ATMOSPHERIC HUMIDITY ON THE MOISTURE CONTENT OF  
DIRECT HARVESTED RAPESEED

---

By John Parish and Michael Poole  
Department of Agriculture, Perth, Western Australia

In Australia most rapeseed crops are harvested direct and stored without further drying. This is in contrast to most other countries where the crop is windrowed, allowed to mature in the windrow, then picked up and often artificially dried.

A major problem encountered when direct harvesting rapeseed crops is shattering of the pods as the machine hits the crops, and, under very dry conditions, cracking of the seed during threshing. To reduce these problems crops are frequently harvested in the evening and at night.

For safe storage of rapeseed without further drying, the seed should be harvested at less than 8.5% moisture content. As the seed is often warm when it is harvested even lower moisture levels are desirable if mould and mite problems are to be completely avoided.

There is much information in the literature on the equilibrium moisture content rapeseed reaches under different levels of relative humidity. However, this applies to naked seed and conditions of constant relative humidity and usually allows several hours for the seed to come to equilibrium. In the field the seed is covered by the pod which can protect the seed during the wetting phase and retain moisture during the drying phase, and also relative humidity is continually changing throughout the day.

Two experiments were conducted to measure the effect of atmospheric humidity on seed moisture content at harvest. In the first experiment (Table 1) rapeseed was harvested hourly for twenty four hours, and RH and seed moisture content were measured on each occasion. Moisture content rose from 5% at an RH of 45%, to 8.6% at an RH of 100% in the early hours of the morning. Peak moisture content lagged about 1½ hours behind peak RH. In the second experiment rapeseed, barley and wheat were harvested over a twenty four hour period at two different maturity stages. Again, seed moisture content and RH were measured. Rapeseed and barley showed large changes in moisture content as RH changed. Wheat moisture content was relatively insensitive to changes in RH.

TABLE 1

EXPERIMENT 1 - EFFECT OF RELATIVE HUMIDITY ON MOISTURE CONTENT OF  
RAPESEED HARVESTED HOURLY OVER A TWENTY FOUR HOUR PERIOD

---

Time (hrs)	RH%	Moisture (%)	Time (hrs)	RH%	Moisture (%)	Time (hrs)	RH%	Moisture (%)
1330	46	5.1	2130	77	6.1	0530	82	8.6
1430	51	5.1	2230	77	6.5	0630	78	8.6
1530	55	4.8	2330	83	6.9	0730	73	8.1
1630	60	5.0	2430	83	7.5	0830	61	7.4
1730	65	5.2	0130	90	7.9	0930	60	7.0
1830	70	5.3	0230	100	8.1	1030	56	6.6
1930	75	5.3	0330	100	8.2	1130	48	5.5
2030	77	6.0	0430	91	8.4	1230	48	5.5

---

TABLE 2

## EXPERIMENT 2 - EFFECT OF RELATIVE HUMIDITY ON MOISTURE CONTENT OF RAPESEED, BARLEY AND WHEAT HARVESTED AT TWO STAGES OF MATURITY

(a) December 19-20. Crop mature, ready for harvest

Time	p.m.						a.m.			
	2	4	6	8	10	12	6	8	10	12
RH%	25	45	60	72	86	90	93	73	68	60
Rape	4.8	4.8	5.4	5.5	6.9	7.5	13.4	10.1	7.2	5.3
Barley	11.6	11.0	11.1	11.6	13.0	14.6	17.3	14.6	13.9	12.2
Wheat	11.3	10.7	10.7	11.1	11.2	11.5	12.6	12.6	12.5	12.0

(b) January 3-4. Crop very dry, harvesting overdue.

Time	p.m.						a.m.			
	2	4	6	8	10	12	6	8	10	12
RH%	50	54	55	68	76	81	88	77	60	56
Rape	5.5	5.2	5.3	5.8	6.0	6.7	8.8	7.5	5.9	5.3
Barley	11.6	11.4	11.6	11.7	12.0	12.7	14.2	13.1	12.0	11.6
Wheat	11.5	11.3	11.4	11.2	11.4	11.4	11.8	11.8	11.5	11.5

These results provide a useful guide to growers direct harvesting rapeseed under conditions of changing relative humidity. It is possible that these results could apply to windrowed rapeseed also, but this remains to be proven.