

# 1 CROP INFORMATION

<b>PRE-SET OPERATING TEMPERATURES:</b>	<b>Page</b>	
<b>Grain Guard Control Box</b>	<b>1.2</b>	
 <b>RECOMMENDED DRYING TEMPERATURES</b>		
<b>CEREALS</b>	<b>Barley</b>	<b>1.3</b>
	<b>Wheat</b>	<b>1.3</b>
 <b>OILSEED RAPE</b>		
		<b>1.4</b>
 <b>LINSEED</b>		
		<b>1.4</b>
 <b>PEAS &amp; BEANS</b>		
		<b>1.5</b>
 <b>OATS</b>		
		<b>1.5</b>
 <b>LUPINS</b>		
		<b>1.6</b>
 <b>HERBAGE</b>		
		<b>1.6</b>
 <b>TEMPERATURE CONVERSION CHART</b>		
		<b>1.7</b>
 <b>GRAIN DRYING NOTES</b>		
		<b>1.8</b>
		<b>1.1</b>

## PRESET OPERATING TEMPERATURES ON DRYERS FITTED WITH GRAIN GUARD CONTROLLER

Grain type	Air Temperature (Plenum)		Grain Temperature (Crop hot)		Cool Temperature* (Crop cold)	
	°F	°C	°F	°C	°F	°C
Barley	190	87	120	49	120	49
Barley seed	130	54	105	41	105	41
Beans	150	65	110	44	110	44
Corn	220	104	130	55	130	55
Corn seed	160	71	110	44	110	44
Flax	150	65	120	49	120	49
Flax seed	120	49	105	41	105	41
Grain Sorghum	230	110	130	55	130	55
Grain Sorghum Seed	160	71	110	44	110	44
Linseed	150	65	105	41	105	41
Oats	160	71	130	55	130	55
Oats Seed	160	71	105	41	105	41
Peas	150	65	105	41	105	41
Rape Seed	180	82	120	49	120	49
Rape Seed Seed	120	49	110	44	110	44
Rough Rice	150	65	110	44	110	44
Rough Rice Seed	120	49	110	44	110	44
Soy Beans	190	87	120	49	120	49
Soy Beans Seed	150	65	105	41	105	41
Sunflower - Bird	140	60	90	32	90	32
Sunflower - Oil	150	65	100	38	100	38
Wheat	170	76	120	49	120	49
Wheat Seed	130	54	105	41	105	41

\*NOTE; The cool temperature is only used on automatic dryer models, it is set at the same temp as the grain hot to allow immediate discharge – for cooling outside the dryer which is used in some set-ups. More normally the grain would be cooled before discharge and this cool temp should be reduce to 10-15°F above the ambient conditions.

## RECOMMENDED DRYING TEMPERATURES

<i>Crop type</i>	<i>Moisture content &amp; points of interest</i>	<i>Plenum temperature</i>	<i>Max. final grain temperature</i>	<i>Final storage level</i>
<b>BARLEY</b>				
Feed		180 - 200°F	120°F	14%
Malting/Seed	Below 21%	120 - 150°F	105°F	
	Above 22%	110 - 130°F	105°F	

If light samples are experienced Maximum Plenum Temperature should not exceed 140°F

### **WARNING!**

Great care should be taken with the storage of barley grown for malting or seed between the actual harvesting of the material and the drying of it. The harvested crop must be stored wet for the minimum amount of time reasonably possible. It is recommended that the crop is not stored in large heaps but spread so that the maximum depth does not exceed 2 feet.

Take care not to operate the dryer at low PTO speeds. In malting or seed crop drying good air flow is important.

<i>Crop type</i>	<i>Moisture content &amp; points of interest</i>	<i>Plenum temperature</i>	<i>Max. final grain temperature</i>	<i>Final storage level</i>
<b>WHEAT:</b>				
Feed		180 - 200°F	140°F	14%
Milling	Below 25%	150 - 180°F	120°F	14%
	Above 25%	140 - 170°F	120°F	14%
Seed		100 - 130°F	105°F	14%

### **SPECIAL NOTES:**

1. High gluten wheats mean slower drying
2. Wet cereals in general i.e., over 27% moisture content - dry carefully.  
Do not exceed Grain Final Safe Temperature. If this is apparent, stop the burner, allow dryer to continue circulating grain until cool, then relight burner and complete drying process.
3. Seed wheat over 27% moisture content - use no heat to a maximum of 105°F plenum until moisture content is below 20%, then continue with care using a plenum temperature of 120°F maximum

*FINAL SAFE STORAGE MOISTURE CONTENT WILL DEPEND UPON STORAGE GRAIN TEMPERATURE  
DUE TO VARYING CROP CONDITIONS THE ABOVE ARE RECOMMENDATIONS ONLY*

<i>Crop type</i>	<i>Moisture content &amp; points of interest</i>	<i>Plenum Temperature</i>	<i>Max. final grain temperature</i>	<i>Final storage level</i>
<b>OILSEED RAPE:</b>				
Oil extraction	Up to 17%	140 - 180°F	120°F	8%

### **SPECIAL NOTES:**

1. Plenum temperatures of up to 200°F have been used without apparent oil/quality loss
2. Excessive heat gives slower drying - cooling prolonged
3. Mature crops dry relatively easily
4. Desiccated early crops may contain 30% volume of immature seeds which are less easily dried
5. High oil content crops mean slower drying
6. With moisture content above 17% - for every 2% increase in moisture content, reduce plenum temperature by 10°F

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<b>OILSEED RAPE:</b>				
Seed	Reduce plenum temperature by 10°F	90 - 120°F	110°F	8%

<i>Crop type</i>	<i>Moisture content &amp; points of interest</i>	<i>Plenum Temperature</i>	<i>Max. final grain temperature</i>	<i>Final storage level</i>
<b>LINSEED</b>				
Oil extraction and/or seed	Up to 15%	120 - 150°F	120°F	8%
<i>*For every 2% increase in moisture content reduce plenum temperature by 10°F</i>				
		90 - 120°F	105°F	8%

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<b>PEAS/FIELDS BEANS:</b>				
Processing/ Protein		110 - 120°F	105°F	14%
<b>NOTE:</b>				
In general protein is not affected by heat but excessive heat will cause splitting damage				
Seed	Below 24%	90 - 110°F	105°F	14%
	Above 24%	70 - 90°F	105°F	14%
	Above 27%	No heat to 50°F	105°F	14%

#### **DIRECT HARVESTED:**

1. Can experience handling problems over 25% moisture content
2. Slow dryer to minimum speed on GRAIN GUARD
3. Do not use loading auger over 25% moisture content (see below)

#### **DRYING FROM STORE:**

1. This crop is susceptible to splitting if excessive heat is used
2. Increase temperature in 5°F stages and check for splits to a maximum of 110°F plenum temperature: No heat - 110°F
3. Do Check for handling damage prior to drying

<i>Crop type</i>	<i>Moisture content &amp; points of interest</i>	<i>Plenum Temperature</i>	<i>Max. final grain temperature</i>	<i>Final storage level</i>
<b>OATS</b>				
Feed		150 - 200°F	130°F	14%
Seed		110 - 150°F	105°F	14%

**NOTE:** Oats for feed use can stand plenum temperatures up to 220°F

**FINAL SAFE STORAGE MOISTURE CONTENT WILL DEPEND UPON STORAGE GRAIN TEMPERATURE  
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<i>Crop type</i>	<i>Moisture content &amp; points of interest</i>	<i>Plenum temperature</i>	<i>Max. final grain temperature</i>	<i>Final storage level</i>
<b>LUPINS:</b>				
Drying for Seed				

- \* With GRAIN GUARD control box dryers use "FLAX SEED" pre set temperatures owing to low heat requirement
- \* Furry seed - may generate fluff in handling
- \* Very tough skin
- \* Pre-drying treatment - pre-cleaning helpful, if not essential

**METHOD:**

1. Polish dryer with barley prior to handling
2. Slow dryer to 500 rpm
3. Be careful if moisture content over 23% / 24% - augers may not handle
4. Recommended plenum temperatures no heat - 105°F - 120°F **ABSOLUTE MAXIMUM**

<i>Crop type</i>	<i>Moisture content &amp; points of interest</i>	<i>Plenum temperature</i>	<i>Max. final grain temperature</i>	<i>Final storage level</i>
<b>HERBAGE SEEDS (SAFE DRYING AIR TEMPERATURES FOR 90% GERMINATION)</b>				
(Grass seed)				
PRG/IRG	Up to 25%	130°F	90°F	13%
	Between 25% - 30%	120°F	90°F	13%
	Between 30% - 35%	110°F	90°F	13%
	Between 35% - 40%	100°F	90°F	13%

**NOTES:**

- \* Always grown for seed
- \* Grass seed does not flow easily over 22% moisture content
- \* Polish the dryer prior to use with barley or other dry grain
- \* Operate PTO speed at about 500 rpm
- \* Check loading auger flights match properly so as not to impede flow of seed

*FINAL SAFE STORAGE MOISTURE CONTENT WILL DEPEND UPON STORAGE GRAIN TEMPERATURE  
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## TEMPERATURE CONVERSION CHART

<i>C</i>	<i>F</i>	<i>C</i>	<i>F</i>	<i>C</i>	<i>F</i>
-17.8	0	32.8	91	195.8	287.6
-15.0	5	33.3	92	197.6	289.4
-12.2	10	33.9	93	199.4	291.2
-9.4	15	34.4	94	201.2	293.0
-6.7	20	35.0	95	203.0	294.8
-3.9	25	35.6	96	204.8	296.6
-1.1	30	36.1	97	206.6	298.4
1.7	35	36.7	98	208.4	300.2
4.4	40	37.2	99	210.2	302.0
7.2	45	37.8	100	212.0	303.8
10.0	50	38.3	101	213.8	305.6
10.6	51	38.9	102	215.6	307.4
11.1	52	39.4	103	217.4	309.2
11.7	53	40.0	104	219.2	311.0
12.2	54	40.6	105	221.0	312.8
12.8	55	41.1	106	222.8	314.6
13.3	56	41.7	107	224.6	316.4
13.9	57	42.2	108	226.4	318.2
14.4	58	42.8	109	228.2	320.0
15.0	59	43.3	110	230.0	321.8
15.6	60	43.9	111	231.8	323.6
16.1	61	44.4	112	233.6	325.4
16.7	62	45.0	113	235.4	327.2
17.2	63	45.6	114	237.2	329.0
17.8	64	46.1	115	239.0	330.8
18.3	65	46.7	116	240.8	332.6
18.9	66	47.2	117	242.6	334.4
19.4	67	47.8	118	244.4	336.2
20.0	68	48.3	119	246.2	338.0
20.6	69	48.9	120	248.0	339.8
21.1	70	49.4	121	249.8	341.6
21.7	71	50.0	122	251.6	343.4
22.2	72	50.6	123	253.4	345.2
22.8	73	51.1	124	255.2	347.0
23.3	74	51.7	125	257.0	348.8
23.9	75	52.2	126	258.8	350.6
24.4	76	52.8	127	260.6	352.4
25.0	77	53.3	128	262.4	354.2
25.6	78	53.9	129	264.2	356.0
26.1	79	54.4	130	266.0	357.8
26.7	80	55.0	131	267.8	359.6
27.2	81	55.6	132	269.6	361.4
27.8	82	56.1	133	271.4	363.2
28.3	83	56.7	134	273.2	365.0
28.9	84	57.2	135	275.0	366.8
29.4	85	57.8	136	276.8	368.6
30.0	86	58.3	137	278.6	370.4
30.6	87	58.9	138	280.4	372.2
31.1	88	59.4	139	282.2	374.0
31.7	89	60.0	140	284.0	375.8
32.2	90	60.6	141	285.8	377.6

$$^{\circ}\text{C} = (\text{ }^{\circ}\text{F} - 32) / 1.8$$

$$\text{ }^{\circ}\text{F} = 1.8 \times ^{\circ}\text{C} + 32$$

E.G.  $120^{\circ}\text{F} = 48.9^{\circ}\text{C}$  OR  $120^{\circ}\text{C} = 248^{\circ}\text{F}$

## GRAIN DRYING NOTES

Date	Crop Type	Plenum Temp	Grain Temp	Cool Temp	% m.c.	Comments