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## Operator's Guide for Mechanical Peanut Curing

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# Operator's Guide For Mechanical Peanut Curing

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## Produce Quality Peanuts

Healthy plants produce quality. Insect and disease-damaged peanuts will not respond favorably to mechanical curing.

## Allow Peanuts to Reach Maximum Permissible Maturity

Healthy peanut plants respond to late season dusting and continue to produce until time for digging. Mature peanuts dry more uniformly, resist molding, give better "mill out" and produce superior flavor.

## Allow Peanuts to Reach "Semi-dry" Conditions In The Windrow

Field curing for 2 to 4 days is recommended as an economic practice in peanut curing. Semi-dry peanuts are damaged less by the combine, require less picking action for separation, and can be dried more economically than green peanuts. Combine when kernels will "rattle" within the shell.

## Dig and Shake Peanuts With Care

Both pod cracking and kernel damage may occur during digging. Adjust digger blades to cut top root just below pods without dragging pods through the soil. Dull blades may ride up into nut portion of plant crushing pods and kernels. Shaker should remove soil and pebbles from plants by a vigorous shaking action.

## Adjust Combine For Operating Condition

Variation within a field or section of a field may justify change in combine setting. Check frequently for cracked or shelled kernels, foreign materials, or excessive pod loss through machine. Variation in windrow condition occurs between morning and afternoon as moisture leaves vine. Reduce aggressiveness of combine for dry, brittle vines.

## Fill Wagons or Bins Carefully

Peanuts should be placed in drying unit immediately after combining. Distribute peanuts uniformly to prevent concentrations of foreign material. Spread peanuts progressively while filling bin or wagon. Level mass of peanuts to obtain uniform resistance to air flow.

## Apply Air Immediately

Apply natural or heated air immediately upon placing peanuts in dryer. Partially filled bins should receive proportionate air flow immediately. Adjust air and heat flow equally into all portions of the dryer. Check air leaving surface of peanuts for uniform flow and adequate distribution. Mold such as *Aspergillus flavus* will not thrive on a properly dried peanut.

## Recommended Optimum Air Flow in C.F.M. At 1" Static Pressure

Depth of Peanuts	Air Volume in C.F.M.		
	4'	3'	2'
Rect. Bin. 8' x 10'	4000	3000	2000
Rect. Bin. 8' x 12'	4500	3375	2250
Rect. Bin. 8' x 14'	5600	4200	2800
Rect. Bin. 8' x 16'	6400	4800	3200
Rect. Bin. 10' x 12'	6000	4500	3000
Rect. Bin. 10' x 14'	7000	5250	3500
Rect. Bin. 10' x 16'	8000	6000	4000
Cir. Bin. 14' Dia.	7700	5775	3850
Cir. Bin. 18' Dia.	12750	9561	6374
Cir. Bin. 21' Dia.	17400	13050	8700

## Air Flow Through Peanuts

Total air flow is dependent upon the porosity of the mass through which it passes and the unit pressure applied. Variation in size of particles within mass are due to foreign material as well as product characteristics. Pebbles and soil in uncleaned peanuts may prevent sufficient air flow for drying or reduce drying rate.

Total demands on a fan are due to drop resistance plus duct losses in transmission. Ducts should be designed for reasonably low friction loss not to exceed .25 to .35 in water pressure.

## Balancing Air Flow

For multiple bin or wagon dryers, use this approximate rule to estimate proportionate gate opening.

Wagon with Maximum Depth		Additional--Wagons	
Gate Opening	Depth of Fill	Gate Opening	Depth of Fill
100%	100"	100%	100"
100%	80"	60%	80"
100%	60"	40%	60"
100%	40"	25%	40"

## Resistance To Air Flow Through Runner Peanuts In Inches of Water

C.F.M./Sq.Ft.	Depth of Peanuts in Feet				
	1	2	3	4	5
25	.07	.12	.18	.20	.26
30	.09	.15	.22	.27	.32
35	.11	.19	.28	.33	.40
40	.13	.24	.34	.41	.50
45	.16	.28	.42	.49	.60
50	.19	.34	.50	.58	.71
55	.22	.41	.59	.69	.84
60	.26	.47	.67	.80	.98

By using a "U" tube manometer, final balancing between wagons may be obtained using the above values. Figures in the table are based on desired pressure immediately under the drying floor with no allowance for losses and do not constitute a basis for fan selection.

## Control Drying Temperature For Quality

Air temperature under the drying floor should not exceed 95°. Check with reliable thermometer, inserting bulb well into air chamber. Allow ample time for bulb to completely settle before reading. A 15° heat rise should furnish ample drying. Relative humidity of drying air should be at least 65% with temperature of 80° or above. Do not allow relative humidity of drying air to drop below 55%.

## Effect of Temperature on Relative Humidity

Outside Temperature	Temp. Rise	Relative Humidity of Natural Air				
		100%	90%	80%	70%	60%
55°	5°	83%	75%	67%	58%	50%
	10°	70%	64%	57%	49%	42%
	15°	59%	53%	47%	41%	35%
	20°	50%	45%	39%	34%	30%
60°	5°	84%	77%	67%	58%	50%
	10°	70%	63%	57%	49%	42%
	15°	60%	54%	48%	42%	36%
	20°	50%	46%	40%	35%	30%
70°	5°	84%	77%	68%	59%	51%
	10°	71%	64%	57%	50%	43%
	15°	61%	54%	49%	42%	37%
	20°	52%	47%	42%	37%	32%
80°	5°	85%	76%	68%	59%	51%
	10°	72%	66%	58%	50%	43%
	15°	62%	56%	50%	44%	38%
90°	5°	80%	76%	69%	60%	51%

## The Humidistat

To reduce off and on cycling, place humidistat in natural air outside of curing system. If outside, set humidistat for 70 to 75% relative humidity, or if in heated air, at 55 to 60% relative humidity.

## Fuel Required to Raise Temperature of Air

Air Flow C.F.M.	Heat Rise					
	5°		10°		15°	
	BTU	Gal/hr	BTU	Gal/hr	BTU	Gal/hr
60,000	330,000	3.54	660,000	7.10	990,000	10.64
30,000	165,000	1.77	330,000	3.55	495,000	5.82
25,000	137,500	1.48	275,000	2.96	413,000	4.45
20,000	110,000	1.18	220,000	2.37	330,000	3.55
18,000	99,000	1.06	198,000	2.23	297,000	3.20
10,000	55,000	.59	110,000	1.18	165,000	1.77
7,000	38,500	.41	77,000	.83	115,500	1.23

\*Based on (Propane) L.P.G. at 100% efficiency. For indirect oil fired unit with 80% efficiency, ~~reduce~~ **INCREASE** fuel requirements above by 15%.

## Maintain Uniform Moisture Content

At the end of curing, moisture should not vary more than 2% within the mass. Moisture differential may be kept low by:

- Cleaning peanuts before drying.
- Not exceeding 4 feet depth of peanuts in dryer.
- Using adequate air with balanced flow.
- Avoiding excessive heat.
- Keeping peanuts dry.

## Avoid Overdrying

Air at 65° and 70°F. will dry peanuts to 6 1/2% if continued. A "coasting effect" will remove 1/2 to 1 1/2% moisture after heat is discontinued. Shut off heat when 10% moisture is reached. (See your County Agricultural Agent for additional information)