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EXAMPLE OF INCREASED DRYING CAPACITY WITH DRYERATION

Equipment: 300 bu. batch dryer with 10 HP fan (20,000 cfm) and 4 million BTU burner
Corn: Field shelled at 25% moisture and dried to 14%

ITEM	CALCULATION	CONVENTIONAL DRYING	DRYERATION
Temperature rise in air	Drying temp − air temp °F	180 − 60 = 120°F	220 − 60 = 160°F
BTU supplied/hr	CFM x temp rise °F	20,000 x 120 = 2,400,000 BTU	20,000 x 160 = 3,200,000 BTU
Moisture reduction	Initial − final (before cooling)	25 − 15 = 10%	25 − 16 = 9%
Water removed, wt/bu	Initial − final (before cooling)	63.3 − 55.8 = 7.5#	63.3 − 56.5 = 6.8#
Water removed/batch	Water removed/bu x bu/batch	7.5 x 300 = 2250#	6.8 x 300 = 1980#
BTU required/batch	BTU/lb H_2O x lbs/batch	2133 x 2250 = 4,800,000 BTU	2020 x 1980 = 4,000,000 BTU
Heat time/batch	$\frac{\text{BTU per batch}}{\text{BTU per hour}}$	$\frac{4,800,000}{2,400,000}$ = 2 hrs	$\frac{4,000,000}{3,200,000}$ = 1.25 hrs
Total time/batch	Time for heating + cooling + handling	2 + 3/4 + 3/4 = 3-1/2 hrs	1-1/4 + 0 + 3/4 = 2 hrs
Batches/14-hr. day	$\frac{\text{14 hrs}}{\text{hrs per batch}}$	$\frac{14}{3.5}$ = 4 batches	$\frac{14}{2}$ = 7 batches
Bushels per day	Batches/day x bu/batch	4 x 300 = 1200 bu	7 x 300 = 2100