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## Grain Storage Systems

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### Decision Tool to Control Wheat Seed Costs

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Besides the price per bag, the per acre cost for wheat seed can vary widely depending on size and quality of each seed lot. A spreadsheet has been put together to help farmers, crop managers, seed salesmen, and consultants closely calculate seed costs per acre, as well as the total and average seed cost for an individual wheat enterprise.

Mike Ellis—a Shelby County, KY no-till farmer and crop manager—originally developed the initial component of this spreadsheet to facilitate drill calibration. It has since been expanded by the author to accommodate different row widths and to include valuable seed cost information. This tool can closely evaluate the actual cost of several different factors that influence the profitability of wheat production, such as the cost for different planting populations and the value of different seed lots as they vary by size and quality.

An example of the spreadsheet is shown in Table 1 with five different soft red winter wheat varieties for a 500-acre farm. Notice that seed costs per acre can vary considerably depending on seed size (compare Lots 1 and 2 for Variety 1) and quality (compare Lots 1 and 2 for Variety 2). Also note that since wheat seed is sold by the pound and precision seeding rates are based on a specified number of seeds per unit area, the smaller seed of equal quality is the better buy provided the same yield potential exists between the varieties being compared (compare Variety 1 with Variety 3).

By simply changing the target population on the spreadsheet the total amount of seed and its cost for a given operation is quickly calculated—a feature that helps farmers select profitable target populations. To illustrate this, the impact of different seeding rates on the total seed cost is shown for a 500-acre operation in Table 2 for a typical range of desired plant populations. In this example, a difference of 50 plants per square yard (or 5.6 seeds per square foot) changes the total seed cost for this farm by \$1,705. Moreover, the difference in total seed costs between timely planting (at 250 seeds/square yard) and late planting (where 350 seeds/square yard may be recommended) can approach \$3,410 or \$6.80 per acre!

The economic implications of treating seed before planting can also be easily evaluated with the spreadsheet. For example, suppose that Variety 2 was found to be of low quality (Lot 1 less than 80% germination), yet when treated with a fungicide the quality was improved (Lot 2 germination above 90%). Incidentally, these are average figures found using 10 samples from the 2002 wheat crop in Kentucky. For the seed size and purity shown in Table 3, the seeding rate for the same target plant population will range from 118 to 99 pounds per acre, respectively. Thus, in this example a treatment cost of \$1.00 per bag is a break-even level. Growers are encouraged to use this spreadsheet to help them control their costs of production.

This spreadsheet is provided at no cost and is readily accessible from the UK Biosystems and Agricultural Engineering Department website ([www.bae.uky.edu/ext/GrainStorage/Calculators/WheatSeed/UK-drillcal.prted.xls](http://www.bae.uky.edu/ext/GrainStorage/Calculators/WheatSeed/UK-drillcal.prted.xls)) or through Cooperative Extension Service offices in Kentucky. It's still a very useful tool for calibrating grain drills too, of course!

Table 1. Seeding rates for five SRW wheat lots based on the desired plant population, row spacing, and seed tag and price data. Total numbers of bags needed and seed costs per acre are calculated for each seed lot along with the average seed costs for the wheat enterprise.

Desired stand		Row spacing In.	Plants per foot of row												
per square yard	per square foot			Seeding rate		Cost									
<b>250</b>	<b>28</b>	<b>7.5</b>	<b>17</b>	Variety	Lot No.	No. seeds per lb	Germ %	Purity %	lb per acre	gram per 200 ft of row	No. acres	No. 50 lb bags	per bag	per seed lot	per acre
<b>Var 1</b>	<b>Lot 1</b>	<b>9,700</b>	<b>92</b>	<b>99.84</b>	<b>136</b>	<b>177</b>	<b>50</b>	<b>136</b>	<b>\$ 11.00</b>	<b>\$ 1,496</b>	<b>\$ 29.92</b>				
<b>Var 1</b>	<b>Lot 2</b>	<b>11,500</b>	<b>90</b>	<b>99.50</b>	<b>117</b>	<b>153</b>	<b>135</b>	<b>317</b>	<b>\$ 11.00</b>	<b>\$ 3,487</b>	<b>\$ 25.83</b>				
<b>Var 2</b>	<b>Lot 1</b>	<b>13,453</b>	<b>77</b>	<b>99.00</b>	<b>118</b>	<b>154</b>	<b>55</b>	<b>130</b>	<b>\$ 5.00</b>	<b>\$ 650</b>	<b>\$ 11.82</b>				
<b>Var 2</b>	<b>Lot 2</b>	<b>13,453</b>	<b>92</b>	<b>99.00</b>	<b>99</b>	<b>129</b>	<b>55</b>	<b>109</b>	<b>\$ 6.00</b>	<b>\$ 654</b>	<b>\$ 11.89</b>				
<b>Var 3</b>	<b>Lot 1</b>	<b>17,089</b>	<b>97</b>	<b>99.97</b>	<b>73</b>	<b>95</b>	<b>205</b>	<b>299</b>	<b>\$ 7.50</b>	<b>\$ 2,243</b>	<b>\$ 10.94</b>				
<b>Total</b>											<b>500</b>	<b>991</b>		<b>\$ 8,530</b>	
<b>Average</b>															<b>\$ 17.06</b>

Note: Items shown in bold are used to calculate the desired values for each variety based on seed tag and cost data.

Table 2. Seed costs for various target plant populations with the same varieties used on the 500-acre farm in Table 1.

Target Population		Total Seed Cost
plants/yard <sup>2</sup>	Plants/ft <sup>2</sup>	
<b>200</b>	<b>22</b>	<b>\$ 6,825</b>
<b>250</b>	<b>28</b>	<b>\$ 8,530</b>
<b>300</b>	<b>33</b>	<b>\$ 10,235</b>
<b>350</b>	<b>39</b>	<b>\$ 11,940</b>
<b>400</b>	<b>44</b>	<b>\$ 13,645</b>

Table 3. Influence of germination on seeding rate and seed costs for Variety 2 with the same target plant population (250 seeds per square yard), seed size (13453 seeds/lb), purity (99.0%) and price per bag (\$5.00) shown in Table 1.

Germination %	Seeding Rate lb / ac	Seed Cost \$/ ac
<b>95</b>	<b>96</b>	<b>\$ 9.56</b>
<b>85</b>	<b>107</b>	<b>\$ 10.69</b>
<b>75</b>	<b>121</b>	<b>\$ 12.11</b>
<b>65</b>	<b>140</b>	<b>\$ 13.98</b>