

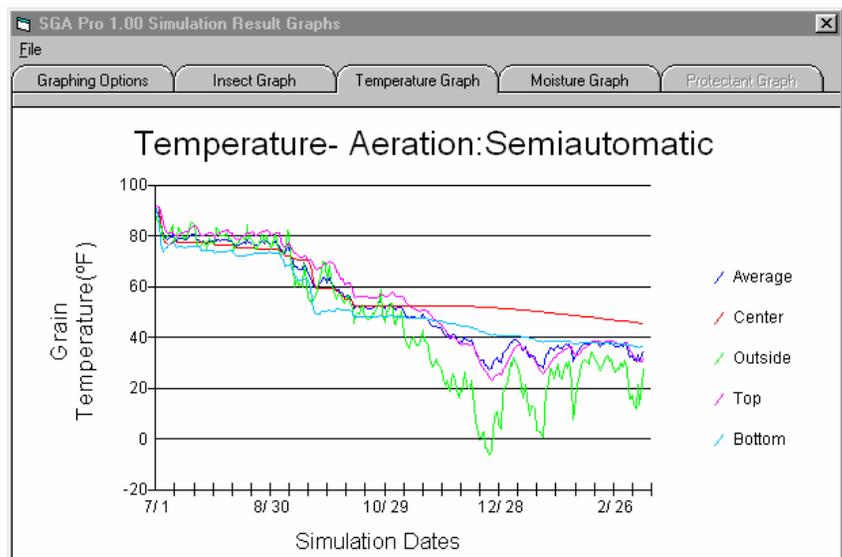
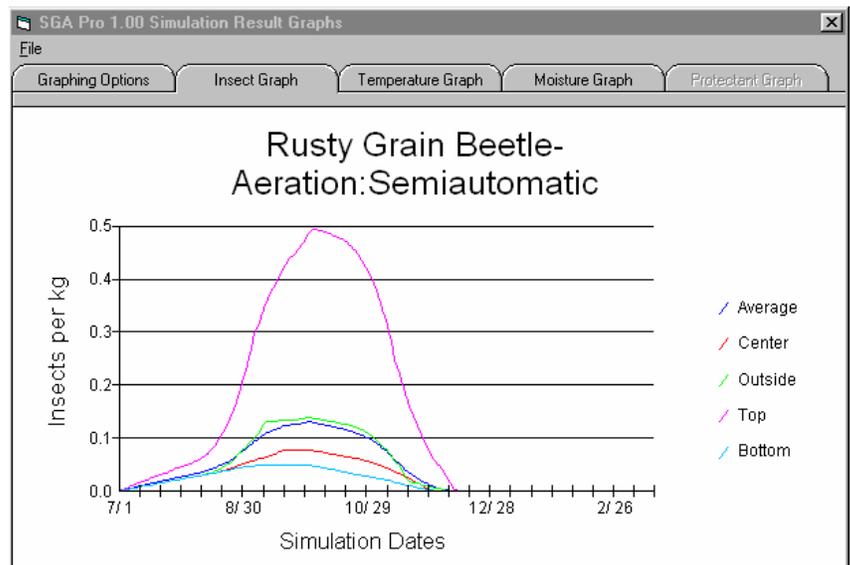


Decision Support Tools

There is a lot of information available on controlling stored-grain insects, but its often difficult to obtain and hard to understand. We are developing a decision support tool called Stored Grain Advisor Pro (SGA Pro) that should be available within a year. Why should you be interested in this software? Well, for starters, this software program will predict when grain will become infested, when it should be fumigated, and how long it will remain uninfested following fumigation. It will also predict the economics of using various controls such as grain turning, aeration, and fumigation. The user will be able to graph changes in insect numbers, grain quality, or grain temperatures and the system will alert the grain manager when a problem is likely to occur in a bin.

SGA Pro

SGA Pro will have three modules: 1) Management - predicts how long you can safely store the grain and provides advice on how to prevent infestation; 2) Database - stores information for each bin on type of grain, quality factors, insect numbers, grain temperatures, and control measures; 3) Sampling - provides advice on when and how to sample stored grain and helps identify grain insects using a graphical key.

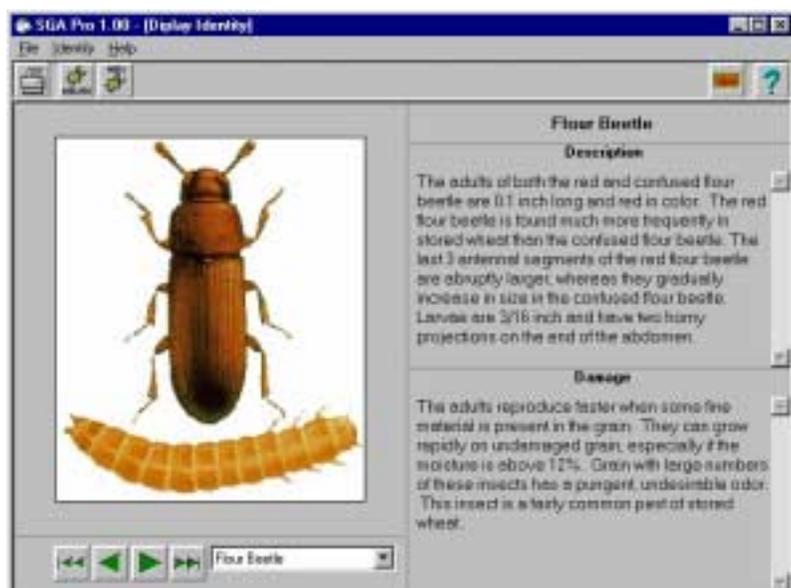


Kansas Edition

SGA Pro 1.00 Data Collection

Bin	Grain	Width (ft)	Depth (ft)	Fan Pow	Aerati Type	Bin Materi	Fan Rate (ft ³ /min/b)	Hours Run	Tempe (F)	Moist (%)	Storage Date	Expect Sell Date	Aeration Date	Protect	Fumigate Date	Insect To Sim
1	Wheat	18.4	19.7	0	None	Concr	0	0	88.5	13	July 1,	February	None	None	None	Rusty
10	Wheat	29.5	29.5	0	None	Steel	0	0	90.5	12.5	July 1,	November	None	None	None	Lesser
11	Wheat	16.4	19.7	0	None	Concr	0	0	89.6	12	July 1,	February	None	None	None	Rusty
12	Wheat	29.5	29.5	10	Manur	Concr	0.1	200	95	12.5	July 1,	February	October	None	August 1,	Rusty
13	Wheat	25.6	20.7	0	None	Steel	0	0	91.9	13	July 1,	February	None	None	None	Lesser
14	Wheat	23	29.5	10	Semia	Steel	0.1	120	91.9	12.8	July 1,	March 15,	July 1,	None	None	Rusty
2	Wheat	16.4	19.7	10	Autom	Steel	0.1	120	89.6	13	July 1,	February	July 1,	None	None	Rusty
2	Wheat	16.4	19.7	0	None	Concr	0	0	89.6	12	July 1,	February	None	Malathic	Septembe	Rusty
3	Wheat	16.4	19.7	5	Autom	Concr	0.1	120	89.8	13	July 1,	February	July 1,	Reldan	Septembe	Rusty
3	Wheat	16.4	19.7	5	Manur	Concr	0.1	120	89.6	13	July 1,	February	July 1,	None	None	Red
4	Corn	16.4	19.7	0	None	Steel	0	0	89.6	13	July 1,	February	None	None	None	Rusty
5	Corn	17.1	19.7	0	None	Steel	0	0	89.6	13	July 1,	February	None	None	None	Rusty
6	Corn	16.4	19.7	0	None	Steel	0	0	89.6	13	July 1,	February	None	None	None	Rusty
7	Corn	16.4	19.7	5	Semia	Steel	0.1	120	89.6	13	July 1,	February	July 1,	None	None	Rusty
8	Corn	16.4	19.7	0	None	Steel	0	0	89.6	13	July 1,	February	None	None	None	Rusty
9	Corn	16.4	19.7	15	Autom	Steel	0.1	120	89.6	13	July 1,	February	July 1,	Reldan	Septembe	Rusty

Bin Name: 1 Grain Type: Wheat Thermostat Set Points:



Plans for the Future

Fumigation with phosphine is the primary method of controlling insects in grain elevators. Recently, the EPA has proposed new risk mitigating measures on the use of phosphine. We are conducting research that should result in more effective fumigations. In commercial elevators, wheat is fumigated with phosphine an average of 3.1 times per year in Kansas. Fumigation frequency could be reduced if fumigations were more effective and done only when needed. In addition, we know that fumigations are less effective on cool grain. We need better information on the effects of grain temperature on fumigation efficacy. We are conducting experiments now to get this data and to build an accurate model that will predict insect mortality, and subsequent insect growth following fumigation. This model will then be incorporated into SGA Pro.

Using SGA Pro

In the insect management module the user selects a bin and enters information on: bin size, storage date, expected shipment date, initial grain temperature and moisture, fumigation date, and aeration date, etc. A Computer model predicts changes in grain temperature, moisture, and insect population growth as well as the effects of fumigation, and aeration. SGA then predicts the length of time the grain can be safely stored under the present conditions. The system uses a powerful model that predicts changes in grain temperature, moisture, and insect density for any region in a bin based on historical weather data. It also shows which areas in the bin insects will reach high numbers. Clicking on the advice button will suggest control methods to use to prevent future problems.

The sampling module will provide help on identifying insects and how to sample grain. A graphical key will ask the user information about the size, shape, and other characteristics. It will then present the user with likely insects and provide pest datasheets on each insect.

SGA Pro will also contain a database that will store weekly information for each bin on: grain temperature, insect numbers, grain quality and other factors. SGA will graph changes in grain temperature or insect numbers over time.

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