

### TIME REQUIRED FOR AERATION

Studies show an air flow rate of 1/10 cfm per bushel will cool grain by aerating about 80 hours in summer, 120 hours in the fall and 160 hours in the winter. Of course, the air flow rate and degree of uniformity affects cooling time. When the air flow rate is doubled, the aeration time should be reduced about one-half or vice versa.

### OPERATING COSTS

The electricity required to power aerating fans is influenced by air flow rate, type and depth of grain, the degree of uniformity, and the number of seasons when cooling is needed. Small grain, such as wheat, may be aerated during fall and winter. Using average cost of electricity and considering the above facts, the cost of electricity for aerating grain varies from 1/5 to 3/4 cent per bushel.

### CONTROLS

Automatic controls which take full advantage of favorable weather are normally used for larger amounts of stored grain; manual controls may be practical for relatively small amounts of grain. Manual controls require a close check of temperature and humidity to determine when to aerate. A *hygrometer* which contains a wet and dry bulb thermometer can be used to determine the relative humidity of the air.

A *humidistat* and a *thermostat* in the wiring circuit, as shown in Figure 4, provide automatic control. Both the humidistat and thermostat are adjustable. The humidistat prevents operation of the fan during periods of high humidity. The thermostat prevents aeration when the air temperature is too high to cool the grain. With these controls, the fan will not operate unless both the humidity and temperature are below the control settings.

### SUMMARY

This publication has discussed methods and use of aeration to properly manage grain stores. Successful storage of grain begins with preharvest management practices to insure proper grain bin sanitation and insect control, followed by proper drying of the grain. The grain must be monitored during storage to head off storage problems. Aeration should be employed to help maintain grain quality in storage to insure uniform temperature throughout the grain mass and to prevent moisture migration.