# Reviewing 1966-67, PSU Tobacco Shed Heat Project

IN REVIEWING the 1966-67 supplemental heat project conducted by Penn State University through the Southeastern Field Research Laboratory in Lancaster County, the above photos show some of the factors involved. At left, top, Jay Rohrer, left and John Yocum, farm superintendent, demonstrate use of the Gastobac Co. equipment designed to eliminate shed burn of tobacco by adding heat during the curing stage Lower left. Rohrer rolls up plastic barrier in the working section of his tobacco shed. The barrier separated the heated from the unheated side in the shed. Upper right, Rohrer puts away some tobacco in the unheated section, which comprises one-third of the shed. Lower right, Yocum shows metering equipment that controls gas flow to the burners in the shed. Burners are turned off and on manually, but will adjust to high or low flame automatically as humidity levels vary. L. F. Photos

## ● Tobacco Heat

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could have been cancelled out if approximately 286 less gallons of propane gas had been consumed in treating the three acres of shed-drying tobacco, Yocum calculated

In view of figures obtained in this year's study, the break-even point for heat would have been limited to 200 gallons of gas at 31 cents per gallon That was the dollar equivalent advantage found for adding heat, as reflected in better quality leaf

Of course, to show an economic advantage for heat in the tobacco shed even less gas would have to have been consumed

### OTHER ADVANTAGES

But there may be some other tangible advantages to be derived from adding heat, the study suggests

For example, when two samples from the heated side of Rohrer's shed were compared with two samples from the unheated side, it was found that a higher percentage of wrapper-quality leaves were obtained where natural curing was aided by heat

In sample #1, taken from the lower tiers, the percent of wrapper to filler, by weight, was 83 1 to 16 9, for the heated section it was 75 2 to 24 8 percent for the unheated section In sample #2, the comparative percentages were 90-10 on the heated side, 82 18 on the unheated side

As Yocum pointed out, if a grower sold his tobacco straight-stripped, he would lose much of the heat advantage The greater the price spread between wrapper and filler leaf the greater his loss would be

Another advantage, Yocum noted, could be in the weight differential between supplemental heat-cured and natural-cured tobacco.

He sampled some leaves from both sides and dried them in an oven to measure moisture content, and found that leaves from the unheated side contained six percent more moisture.

"On an equal moisture basis, this would reduce yield figures in the unheated side by six percent, and, if the tobacco were sold on the basis of its moisture content, would show an added advantage for heat," Yocum noted. Unfortunately, the tobacco companies tolerate a fairly wide range of moisture without penalty.

"They don't want tobacco too wet or too dry, but the range of acceptable moisture content is quite wide," Yocum explained.

### 1965-CROP RESULTS

Using gas as a source of supplemental heat in a previous experiment, Henry Engle, research agronomist at the station, showed results indicating a decided economic advantage for heat.

The 1965-66 curing season was poorer than this past season, and Engle found a 20 percent loss of leaf weight where heat was not added He also reported that every $1 invested in heat yielded a return of $3. He calculated costs at $16 an acre for fuel and $9 an acre for equipment depreciation, figuring a 12-year depreciation period on the latter.

### ADDITIONAL EXPERIMENT

As another part of this year's trials on supplemental heat, three acres of tobacco were hung in a neighbor's shed because the shed at the research station was knocked off its foundation by high winds late last summer.

Heat was added in this experiment, but the shed was not divided with plastic This meant that some of the heat would have escaped to the unheated side, and its full effects could not be measured

"In the six years that I have been here," Yocum said, "there has always been some shed burn in that neighbor's shed. With heat added, this was the first year he had no damage." Although no valid information could be gathered from that project since the shed was not properly divided, Yocum noted that a fuel cost of approximately $36 per acre for supplemental heat shows how costs can be controlled in this process.

### WHEN TO HEAT

The equipment used in the project on the Rohrer farm must be turned on and off manually Once turned on, the burners will adjust automatically from a high to a low flame, but judging when the heat must be added, or taken away, lies with the operator

"It has been shown," Yocum said, "that when humidity goes above 80 percent for more than 48 hours micro-organisms start their rotting process." (See Chart #1)

He recommends turning the burners on whenever the humidity reaches the 80 percent level for two consecutive days, then turning them off when natural humidity drops.

It is hoped that supplemental heat may be the answer to some of the reported slow curing problems on Pennbel-69. Some farmers have complained that because of Pennbel's closer leaf arrangement it was hard to cure, Yocum noted.

### NEXT YEAR

One important result of this year's supplemental heat study has been to point out some of the economic pitfalls in the process The several management lessons learned this year will be applied in future studies, Yocum said.

Next year, tobacco will be planted normally in cooperators' fields Then certain areas will be staked off by Yocum. At harvest, samples will be tagged, and one-half of each

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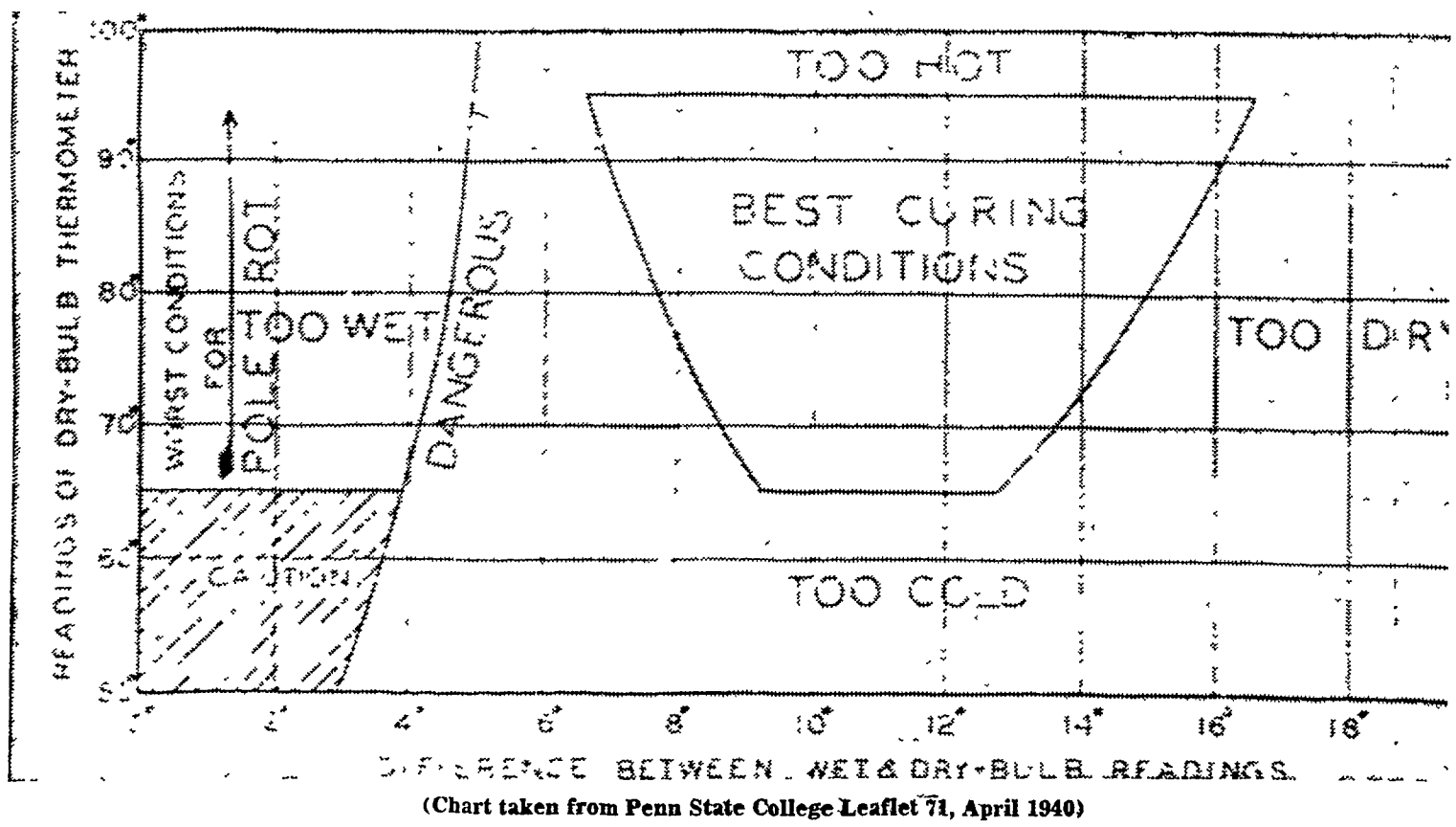
CHART NO. 1

## TOBACCO CURING CHART




(Chart taken from Penn State College Leaflet 71, April 1940)