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Paper No. 85

January 1954

GEORGIA COASTAL PLAIN EXPERIMENT STATION
Tifton, Georgia

Information based on results of practical experiments in agriculture for press release and distribution

IMPROVEMENTS IN TOBACCO BARN CONSTRUCTION

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Results from several years studies at this Station in curing bright leaf tobacco reveal that most curing barns lack one or more construction features to be good and worthy of their role with such an important crop.

The main function of a tobacco barn in curing tobacco is to provide a means of subjecting the tobacco to definite conditions of environment involving controlled rates of temperature and humidity. Without construction features which make it dependable in giving and maintaining the essential environment for curing, it is not a good barn and may be losing money for the farmer yearly. Much of the farmer's skill in curing may be lost in the use of barns which are not constructed with adequate provisions to give them response to his management efforts. Studies at the Station have been aimed primarily toward refining methods and facilities to reduce the element of chance which is very great in common tobacco curing practices.

The greatest weakness in barns generally appears to be in the lack of capacity in top ventilation. Tests have proven that tobacco is easily damaged by inadequate ventilation during the critical period of "going up" on the heat in drying the leaf. Best results have been obtained where adjustable ventilators made it possible to vent freely during the temperature rise after a high degree of yellowing had been obtained with relatively low temperature. Adjustable vents also permit closing the barn during the last stages of killing stems, thereby saving considerable fuel.

A new type top ventilator has been designed and is recommended for building into old and new barns. The ventilator is very simple and easy to construct on the ridge of the barn roof. A drawing of the ventilator is attached hereto. Also attached is a drawing for a complete barn, incorporating other essential features as well as the new ventilator, and accenting economy of construction and maintenance and efficiency in performance. Discussed below are the essential basic construction features which should be provided in tobacco barns:

1. A well drained floor reduces fuel consumption and minimizes amount of ground water evaporating through tobacco; also reduces rusting and corroding of

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heating equipment during idle periods. About a six inch fill of sand, cinders or gravel is recommended.

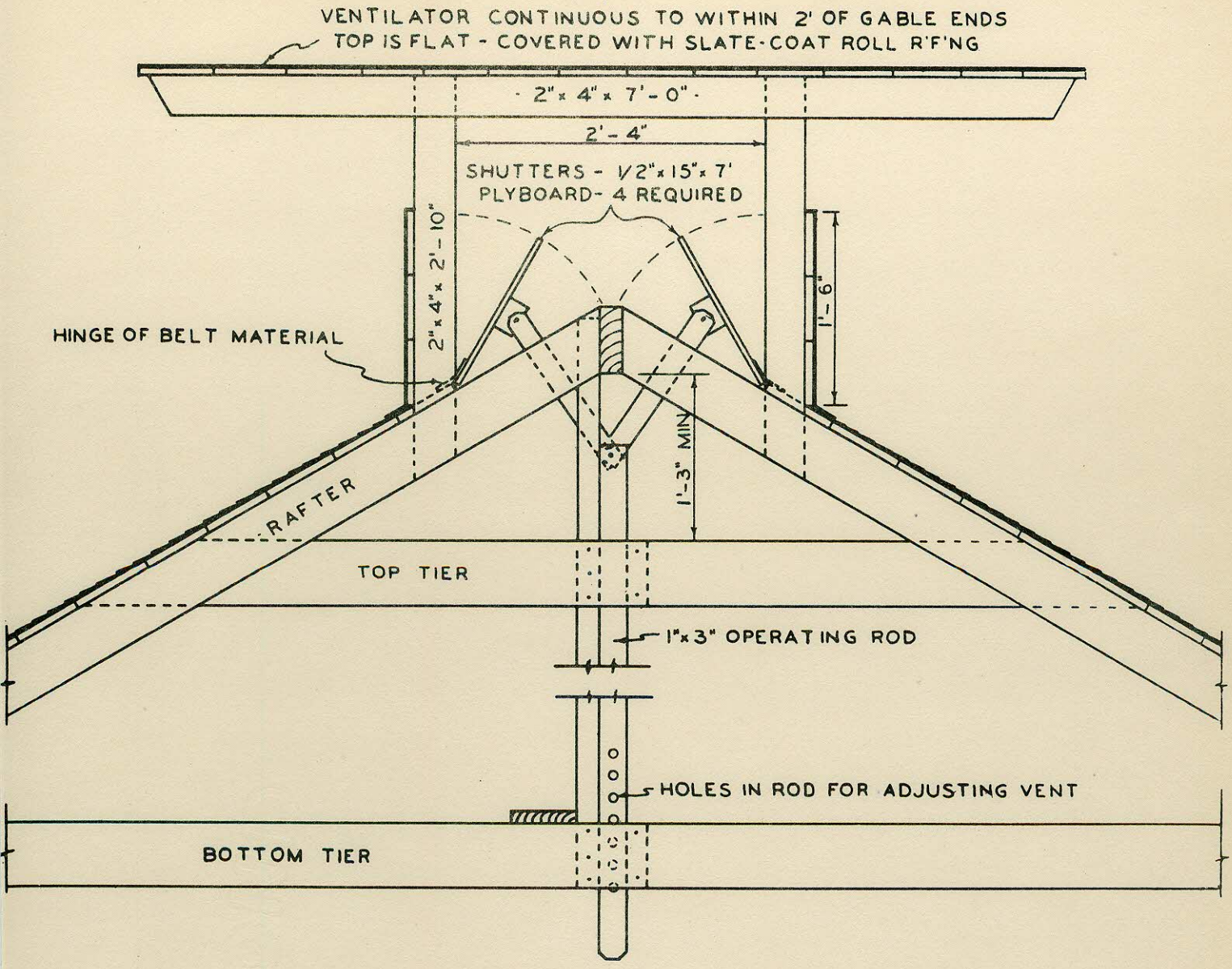
2. Adequate bottom ventilation providing uniform distribution around base of barn is recommended. Suggest new barns employ concrete block foundation wall with one complete course of four inch blocks laid on side with cells open through wall. It is not usually necessary to close these vents at any time if top vents are adjustable and may be closed.

3. Well insulated walls block out and greatly reduce the effect of adverse outside weather conditions, thereby aiding in maintaining closer uniformity of inside temperature distribution. Insulated walls eliminate "cold" corners and contribute to uniformity of curing. They lower fuel consumption by shorter curing time. New and old barns may be insulated with commercial insulation such as rock wool held between wall studs with chicken wire; fiber glass and others; and fill type insulation may be used where sufficient backing is provided on inside to hold it, and outside protection from moisture is provided. Some suggested fill insulations are granulated rock wool, vermiculite, dry sawdust, wood shavings, cotton seed hulls, and peanut hulls. Concrete blocks for main walls are not recommended for tobacco barns due to very low heat holding ability. An eight inch block wall is only about equivalent in heat holding ability to a three-quarter-inch thickness of pine.

4. A "warm" type roof is essential. If metal covering is used, felt or other insulating material should be placed underneath to prevent exposure of the "cold" metal surface to the inside of barn. On new barns it is recommended that asphalt shingles or metal roofing be placed over solid sheathing and felt. If metal is placed on one-inch sheathing nails should be crimped underneath.

5. Adjustable top ventilation is a very important provision. It should consist of as much opening capacity as is feasible to provide. Suggest at least three square feet of opening area per 100 sticks of the barn capacity of tobacco.

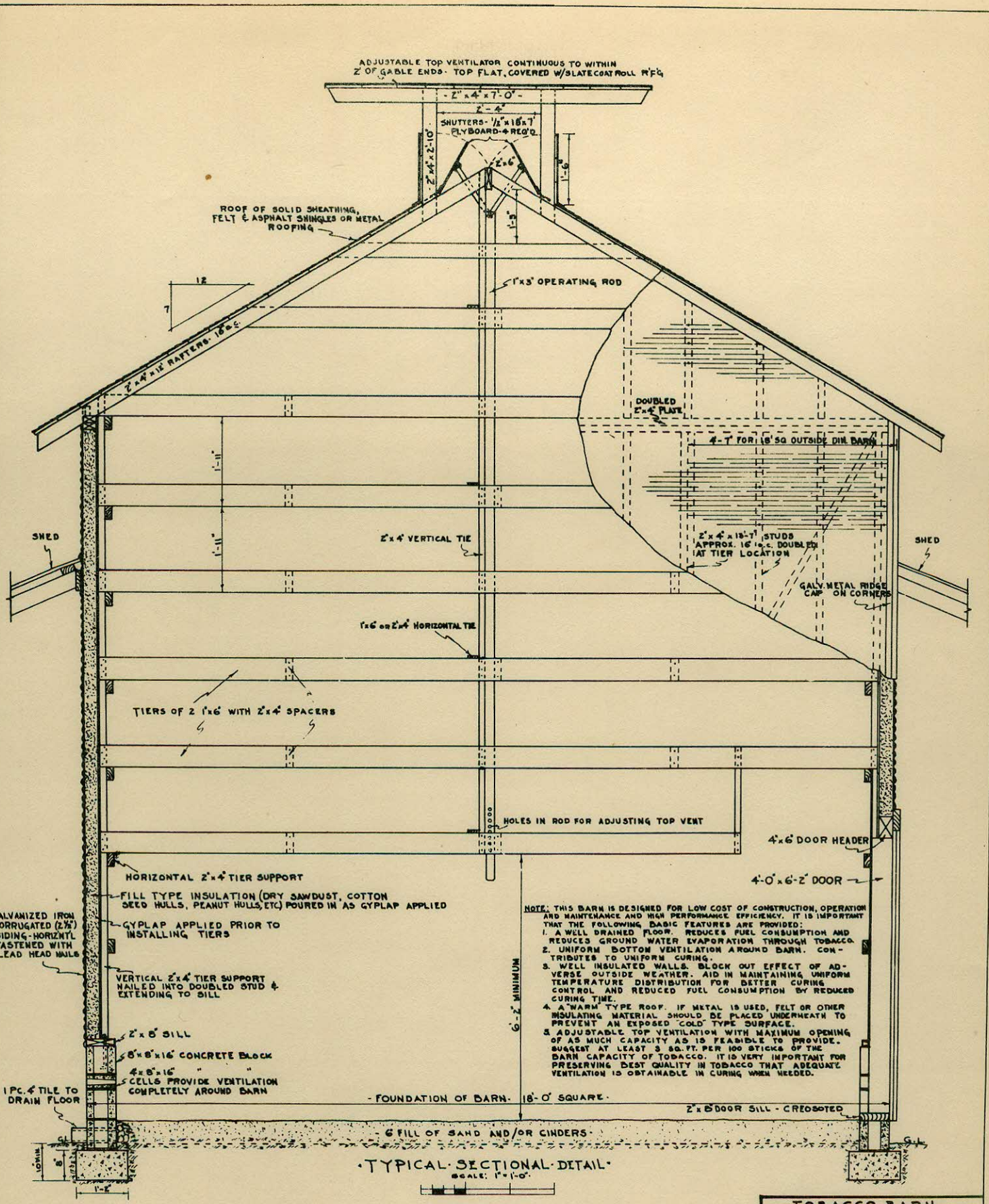
It is believed that tobacco farmers will profit greatly by observing the above specifications in curing barns. Most old barns can be modified at little cost to meet desirable standards.



TOBACCO BARN TOP VENTILATOR

DESIGNED BY

AGRICULTURAL ENGINEERING DEPARTMENT
COASTAL PLAIN EXPERIMENT STATION
COLLEGE OF AGRICULTURE
UNIVERSITY OF GEORGIA



NOTE: THIS BARN IS DESIGNED FOR LOW COST OF CONSTRUCTION, OPERATION AND MAINTENANCE AND HIGH PERFORMANCE EFFICIENCY. IT IS IMPORTANT THAT THE FOLLOWING BASIC FEATURES ARE PROVIDED:

1. A WELL DRAINED FLOOR. REDUCES FUEL CONSUMPTION AND REDUCES GROUND WATER EVAPORATION THROUGH TOBACCO.
2. UNIFORM BOTTOM VENTILATION AROUND BARN. CONTRIBUTES TO UNIFORM CURING.
3. WELL INSULATED WALLS. BLOCK OUT EFFECT OF ADVERSE OUTSIDE WEATHER. AID IN MAINTAINING UNIFORM TEMPERATURE DISTRIBUTION FOR BETTER CURING CONTROL AND REDUCED FUEL CONSUMPTION BY REDUCED CURING TIME.
4. A "WARM" TYPE ROOF. IF METAL IS USED, FELT OR OTHER INSULATING MATERIAL SHOULD BE PLACED UNDERNEATH TO PREVENT AN EXPOSED "COLD" TYPE SURFACE.
5. ADJUSTABLE TOP VENTILATION WITH MAXIMUM OPENING OF AS MUCH CAPACITY AS IS FEASIBLE TO PROVIDE. SUGGEST AT LEAST 3 SQ. FT. PER 100 STICKS OF THE BARN CAPACITY OF TOBACCO. IT IS VERY IMPORTANT FOR PRESERVING BEST QUALITY IN TOBACCO THAT ADEQUATE VENTILATION IS OBTAINABLE IN CURING WHEN NEEDED.

TYPICAL SECTIONAL DETAIL

SCALE: 1" = 1'-0"

TOBACCO BARN

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