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# TENNESSEE AGRICULTURE

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NASHVILLE  
JULY 1, 1914

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## IN THIS ISSUE:

Description and Itinerary of Agricultural Special Train.

Twofold Value of the Honeybee.

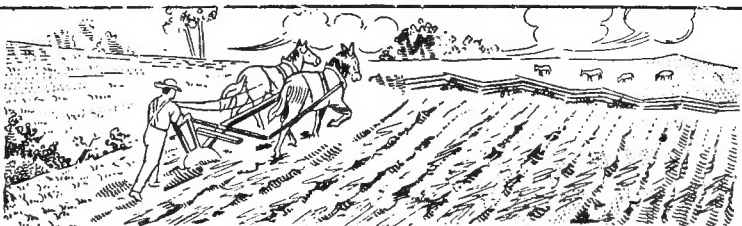
Do Bees Injure Fruit?

Combining Beekeeping and Farming.

Report of State Inspector of Apiaries. Brood Diseases of Bees.

Some Nectar and Pollen-Bearing Plants of Tennessee.

Crop Report for June.



# TENNESSEE AGRICULTURE

A Magazine Devoted to the Conservation and Development of the  
Agricultural Interests of Tennessee

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THOMAS F. PECK, Commissioner

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JULY 1, 1914.

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DR. GEORGE R. WHITE, State Veterinarian.  
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J. A. DINWIDDIE, Assistant Commissioner for East Tennessee.  
JESSE TOMLINSON, Assistant Commissioner for Middle Tennessee.  
R. T. DEBERRY, Assistant Commissioner for West Tennessee.  
J. W. WYNN, Feed, Seed and Fertilizer Inspector for East Tennessee.  
NOBLE C. WHITE, Feed, Seed and Fertilizer Inspector for Middle Tennessee.  
A. M. STOUT, Feed, Seed and Fertilizer Inspector for West Tennessee.  
G. M. BENTLEY, State Entomologist and Plant Pathologist.  
DR. J. S. WARD, State Inspector of Apiaries.  
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**AGRICULTURAL SPECIAL TRAIN.**

Special Will Leave Nashville, Wednesday, July 15—Tour Will End on Tuesday, September 15.

The great good accomplished by the Agricultural Demonstration trains operated by the Department of Agriculture in 1911 and 1912, and the numerous requests from all sections of the State for the running of another Agricultural Special this year, have induced the Department of Agriculture to again undertake this enterprise for the summer of 1914.

More than 250 points on the railroad lines of Tennessee were made by the train run in 1912, which traveled more than 6,000 miles and was seen by more than 200,000 people, principally farmers and their families. The train carried exhibits and demonstrations helpful to every phase of rural life, and its good effects are still felt and will continue to be felt throughout the State for many years to come.

To continue the work begun in this direction by the present administration of the Department of Agriculture, Commissioner T. F. Peck has, through the liberality and progressive policies of the railroads operating in Tennessee, made arrangements to send out a train this year more thoroughly equipped to carry the gospel of scientific farming into every county in the State having railroad mileage.

The 1914 train will be composed of nine cars and engine, and each car will be fitted up to make a complete exhibit in itself. Assisting the Department of Agriculture this year will be the State Departments of Health and Education.

The Special will leave Nashville at 9:30 a.m. Wednesday, July 15, over the Tennessee Central Railroad, going first to Ashland City, and making two other stops, Doddsville and Spaulding, on that day, and will return to Nashville that night, leaving again the next morning, going east. While on the lines of the Tennessee Central, the train will be accompanied by Rutledge Smith, Superintendent of that road, and will be accompanied by representatives of the various roads while on their lines. The tour of the Agricultural Special will end on Tuesday, September 15, the last stop being a night meeting at Iron City, in Lawrence County, on the lines of the Louisville & Nashville.

The arrangements made by Commissioner Peck with the railroads of the State mean that this train will be operated without any cost to the taxpayers of the State. The roads furnish all the equipment for the train and the crew to operate it. The officials connected with the Department of Agriculture and the Departments of Health and Educa-



*J. F. Peck*

tion will deliver the lectures, and this means that there will be no additional cost for these, as they are already on salary.

The railroads cooperating with the Department of Agriculture this year in operating the train include every road doing business in the State. They are:

- The Nashville, Chattanooga & St. Louis Railway.
- The Louisville & Nashville Railroad.
- Southern Railway, and allied lines.
- The Tennessee Central Railroad.
- The Illinois Central Railroad.
- The Mobile & Ohio Railroad.
- Cincinnati, New Orleans & Texas Pacific Railway.
- The Birmingham & Northwestern.
- The Knoxville, Sevierville & Eastern.
- The Carolina, Clinchfield & Ohio.
- The Tennessee, Kentucky & Northern.

No effort will be spared by the Department of Agriculture to fit out the train to be an object lesson to the farmers of the State in better farming, live stock breeding, dairying, etc., and to show to the farmers' wives and daughters the best that there is in housekeeping and making the farm home attractive. Each car will be in charge of a trained lecturer, and an abundance of literature will be on hand for free distribution, touching on all the subjects of interest to the farmer and his family.

Car No. 1 will be the Farm Crops Car, and will be in charge of A. L. Garrison, Chief Feed, Seed and Fertilizer Inspector, with capable assistants. It will contain exhibits of forage crops, grasses, grains, fertilizers, feeds, seeds, etc.

Car No. 2 will be the Fruits, Vegetables and Apiary Car, and will be in charge of State Entomologist G. M. Bentley and State Apiary Inspector J. S. Ward. It will have exhibits of fruits, vegetables, spraying appliances for the apiary, and literature for free distribution on these subjects.

Car No. 3 will be Live Stock Car, with Dr. George R. White, State Veterinarian, in charge. This car will be fitted up in the most modern style with the best dairy and barn equipment. It will carry an exhibit of animals which will be interesting as well as instructive. It has been planned to carry animals which have been bred in Tennessee and owned by private individuals located in different sections of the state. Typical animals of the respective types will be furnished by the following owners:

Cattle—Polled shorthorn heifer, C. J. Bullock, Cookeville; Aberdeen Angus, not yet selected; Hereford heifer, W. J. Robinson, Lancaster; Jersey heifer, Percy C. Brown, Spring Hill; Holstein heifer, Simeon Hill, Memphis; Guernsey heifer, Simeon Hill, Memphis.

Sheep—Cheviot, H. C. Davidson, Elbridge; Dorsett, Percy C. Brown, Spring Hill; Southdown, Percy C. Brown, Spring Hill.

Swine—Berkshire, J. W. Russwurm, Nashville; Hampshire, A. L. Garri-

son, Crossville; Duroc Jersey, not yet selected; Yorkshire, Percy C. Brown, Spring Hill; Poland China, Jay R. Mitchell, Sparta.

It is hoped that the live stock exhibit with the instructive lectures delivered at every stop, will tend to promote interest in pure-bred animals on Tennessee farms.

Car No. 4 will be the Health Car, and will be under the auspices of the State Board of Health, with Dr. Lucius P. Brown, State Pure Food and Drugs Inspector, actively in charge. It will contain exhibits showing the extensive work of the State Board of Health, the Anti-Tuberculosis League, the State Pure Food and Drugs Department in the betterment of health conditions in Tennessee and the protection of the consumer from adulterated and impure foods and short measure.

Car No. 5 will be the Education Car, and in charge of Prof. M. W. Robinson, Agricultural Supervisor in the High Schools. This car will contain



T. G. Settle



Col Robert Gates, L. & N. R. R.

exhibits showing the work of the State Department of Education in promoting the study of agriculture in the schools, and will also have exhibits from the industrial departments of the State Normal schools at Murfreesboro, Memphis and Johnson City.

Car No. 6 will be the Domestic Science and Dairy Car, and will be under the supervision of Miss Lucy Buttorff, a trained lecturer on domestic science, and T. B. Robinson, a dairy expert. This car will have exhibits showing the latest in conveniences for the farm home and the dairy.

Car No. 7 will be the Platform Car for live stock demonstration, and will also be fitted with a crusher for grinding limestone for fertilizing purposes, and literature on this subject will be distributed, and the operation of the machine explained. This car will also have an engine and dynamo to



furnish power for the crusher and light for the train, which will be electrically lighted throughout, enabling night stops and demonstrations.

Car No. 8 will be the Dining Car, in charge of Mrs. John W. Thomas. This will be outfitted to accommodate all those accompanying the train, including the operating crews.

Car No. 9 will be the Sleeping Car, which will accommodate all those who will be with the train throughout the entire trip.

Farm bulletins, agricultural papers, and other literature will be distributed at every stop of the train. These will cover all subjects of interest to the farmer and his family, and there will be an abundant supply.

#### TAKES PLACE OF INSTITUTE.

The Agricultural Special will take the place of county institutes in the counties it is enabled to reach, and it is expected to be more beneficial and effective, because the train and its exhibits will be seen by a much larger number of people in the rural communities than could possibly be gotten to attend the institutes. County institute work has been and is being conducted in those counties not reached by railroads.

The train is to be operated at a time when the farmer and his family have the most leisure, and it is hoped by the Commissioner of Agriculture that every one who is convenient to the scheduled stops will attend. They will see on the train what many of them would not have an opportunity to see otherwise. They will see the finest types of beef and dairy cattle, the best breeds of sheep and hogs, and the best poultry, and hear the very best lectures on these subjects. They will learn about the silo—how to build it and how to fill it and feed ensilage. They will learn about agricultural lime for sweetening their soils, and how to grow clover, and all about winter cover crops.

They will be enabled to see the most practical in dairy equipment; about the care of the orchard, spraying and pruning trees, and about marketing fruits and vegetables; about the honeybee—how to keep it with pleasure and profit; about the work that is being done by the State Department of Agriculture to eradicate hog cholera from the State, and see demonstrations of the use of cholera serum and the virus in the simultaneous treatment for this scourge, and will be instructed in the use of this serum and virus, which will render their swine absolutely immune from this deadly disease.

Visitors to the train will be shown the progress that has been made for rural education in the State, and will be told the benefits and advantages of rural community cooperation. They can learn how to prevent disease by using preventive measures. The farmers' wives and daughters may learn about domestic science and home economics, and

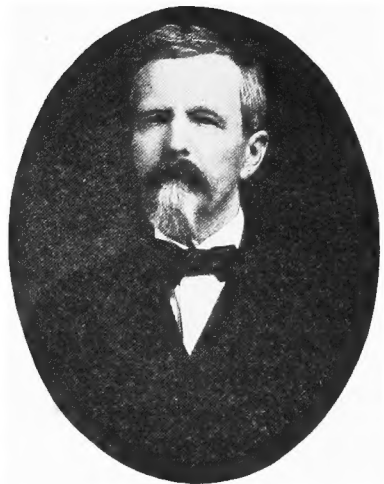
what is being done to make home life on the farm more comfortable and more attractive.

The farmer who leaves the "shade of the old apple tree" on the farm, traveling miles over dusty highways to the railroad, will find that his time has not been wasted, and that he will gain useful information that will enable him to do better along all lines than he has done in the past. A visit to the train can not be without profit. The train is planned to offer helpful suggestions that may be easily put into practice, and this opportunity should be taken advantage of by every farmer in the State who is convenient to any of the scheduled stopping places.

Those having the train in charge will leave nothing undone to make the tour a success, in that it will disseminate useful information for the benefit of all who may care to learn. The dates will be pub-



**Dr. Geo. R. White.**



**Jesse Tomlinson**

lished often in the county papers, and by posters, so that every one may be ready to take a day off and profit by a visit to the Agricultural Special.

#### THE PERSONNEL OF THE TRAIN.

The Agricultural Special will be in charge and under the direct supervision of Commissioner of Agriculture T. F. Peck, who has designated the following to assist him in this tour:

Dr. George R. White, State Veterinarian, live stock.

T. G. Settle, Chief Clerk.

A. L. Garrison, Chief Feed, Seed and Fertilizer Inspector, soils and crops.

G. M. Bentley, State Entomologist, fruits, vegetables, orchards and nurseries.

Dr. J. S. Ward, State Inspector of Apiaries, lectures on the honeybee.

J. N. Meroney, silos.

Jesse Tomlinson, Assistant Commissioner of Agriculture, lectures on community cooperation.

R. T. DeBerry, Assistant Commissioner of Agriculture, lectures on truck growing.

J. A. Dinwiddie, Assistant Commissioner of Agriculture, lectures on poultry and poultry products.

Prof. H. A. Morgan, Director of the Experiment Station, University of Tennessee.

Dr. B. W. Murphy, live stock.

Dr. J. C. Schoenlaub, live stock.

Frank Van Pelt, farm machinery.

W. B. Shoulders, live stock.

J. J. Kittell, live stock breeding.

N. C. White, stock feeds.

J. W. Wynn, fertilizers.

A. M. Stout, field seeds.

J. W. Russwurm, Tennessee State Fair.

T. B. Robinson, dairying.

W. C. Jones, exhibits.

Bruce Settle, exhibits.

Mrs. John W. Thomas, dining car.

H. N. Hardeman, stenographer.

J. B. Curd, Tennessee State Fair.

S. H. Thompson, State Superintendent of Public Instruction.

W. R. Bowine, Department of Education.

S. Y. Adcock, Department of Education.

M. W. Robinson, State Department of Education.

Dr. R. Q. Lillard, State Board of Health.

Dr. Olin West, State Board of Health.

Dr. H. H. Shoulders, State Board of Health.

Dr. L. P. Brown, State Pure Food and Drugs Inspector.

George G. Draper.

Dr. T. B. Hughes.

Miss Lucy Buttorff, domestic science.

Miss Nettie Armstrong, domestic science.

Miss Helen Buquo, domestic science.

Miss Zelma Biggs, education.

Miss Hera Robinson, education.

Verd Peterson, agriculture in Middle Tennessee Normal.

W. J. Sowder, agriculture in East Tennessee Normal.

V. S. Bright, agriculture in West Tennessee Normal.

Prof. R. L. Jones, President Middle Tennessee Normal.

Prof. J. W. Brister, President West Tennessee Normal.

Prof. S. G. Gilbreath, President East Tennessee Normal.

Not all of those named above will be with the train throughout the entire tour, but will alternate in the three grand divisions of the State.

## ITINERARY OF THE SPECIAL.

The Agricultural Special will leave Nashville at 9:30 a. m., Wednesday, July 15, over the Tennessee Central Railroad. About 300 stops have been scheduled, and in making these, the train will travel about 6,500 miles. The itinerary, as prepared by the Department of Agriculture and approved by the railroads, is as follows:

## TENNESSEE CENTRAL RAILROAD.

## Wednesday, July 15.

Ashland City—10:30 a. m. to 12:30 p. m.

Doddsville—1:30 p. m. to 3:00 p. m.

Spaulding—3:30 p. m. to 4:30 p. m.



A. L. Garrison



R. T. DeBerry

## Thursday, July 16.

Mt. Juliet—9:30 a. m. to 11:00 a. m.

Lebanon—11:45 a. m. to 1:30 p. m.

Brush Creek—4:10 p. m. to 5:30 p. m.

Hickman—Night Meeting, 7:30 p. m.

Watertown—2:15 p. m. to 3:45 p. m.

## Friday, July 17.

Gordonsville—8:30 a. m. to 10:00 a. m.

Carthage—10:20 a. m. to 12:00 a. m.

Lancaster—12:30 p. m. to 2:00 p. m.

Buffalo Valley—2:15 p. m. to 4:00 p. m.

Baxter—4:30 p. m. to 5:30 p. m.

Bloomington—Night Meeting, 7:30 p. m.

## Saturday, July 18.

Cookeville—8:30 a. m. to 10:00 a. m.

Algood—10:15 a. m. to 11:00 a. m.  
 Livingston—12:30 p. m. to 2:00 p. m.  
 Monterey—4:30 p. m. to 5:30 p. m.  
 Mayland—Night Meeting, 7:30 p. m.

**Monday, July 20.**

Crossville—8:30 a. m. to 10:30 a. m.  
 Crab Orchard—11:15 a. m. to 12:30 p. m.  
 Daysville—12:50 p. m. to 2:00 p. m.  
 Cardiff—2:30 p. m. to 3:30 p. m.  
 Harriman—3:45 p. m. to 5:30 p. m.

**QUEEN AND CRESCENT ROUTE.**

**Tuesday, July 21.**

Oakdale—10:20 a. m. to 11:00 a. m.  
 Lansing—11:35 a. m. to 12:15 p. m.  
 Sunbright—12:35 p. m. to 1:00 p. m.  
 Glen Mary—1:15 p. m. to 2:00 p. m.  
 New River—2:15 p. m. to 3:00 p. m.  
 Helenwood—3:10 p. m. to 4:00 p. m.  
 Oneida—4:10 p. m. to 5:30 p. m.

**Wednesday, July 22.**

Melville—8:30 a. m. to 9:10 a. m.  
 Rathburn—9:20 a. m. to 9:50 a. m.  
 Sale Creek—10:05 a. m. to 10:40 a. m.  
 Graysville—10:55 a. m. to 11:30 a. m.  
 Dayton—11:45 a. m. to 1:30 p. m.  
 Evensville—1:45 p. m. to 2:20 p. m.  
 Spring City—2:45 p. m. to 3:40 p. m.  
 Rockwood—4:25 p. m. to 5:10 p. m.

**SOUTHERN RAILWAY.**

**Thursday, July 23.**

Oliver Springs—9:45 a. m. to 11:00 a. m.  
 Marlow—11:20 a. m. to 12:25 p. m.  
 Clinton—1:00 p. m. to 3:00 p. m.  
 Vasper—3:45 p. m. to 5:00 p. m.  
 Pioneer—Night Meeting, 7:30 p. m.

**Friday, July 24.**

Maloneyville—9:00 a. m. to 10:00 a. m.  
 Corryton—10:20 a. m. to 11:30 a. m.  
 Luttrell—11:45 a. m. to 12:30 p. m.  
 Liberty Hill—1:15 p. m. to 2:00 p. m.  
 Lone Mountain—2:30 p. m. to 3:30 p. m.  
 Tazewell—3:45 p. m. to 4:30 p. m.  
 Cumberland Gap—Night Meeting, 7:30 p. m.

Saturday, July 25.

Blaine—10:00 a. m. to 11:00 a. m.  
 Red House—11:10 a. m. to 12:00 m.  
 Joppa—12:15 p. m. to 1:00 p. m.  
 Rutledge—1:20 p. m. to 2:20 p. m.  
 Clinchdale—2:45 p. m. to 3:45 p. m.  
 Crosby—4:30 p. m. to 5:30 p. m.

Monday, July 27.

Straw Plains—9:30 a. m. to 10:30 a. m.  
 New Market—10:50 a. m. to 1:00 p. m.  
 Jefferson City—1:15 p. m. to 2:30 p. m.  
 Talbott—2:45 p. m. to 3:30 p. m.  
 Morristown—3:50 p. m. to 5:30 p. m.



G. M. Bentley.



State Supt. S. H. Thompson

Tuesday, July 28.

Russellville—8:45 a. m. to 10:00 a. m.  
 Bull's Gap—10:20 a. m. to 11:30 a. m.  
 Mosheim—12:05 p. m. to 1:00 p. m.  
 Greeneville—1:20 p. m. to 3:00 p. m.  
 Chuckey—3:30 p. m. to 4:30 p. m.  
 Limestone—4:10 p. m. to 5:30 p. m.  
 Jonesboro—Night Meeting, 7:30 p. m.

Wednesday, July 29.

Johnson City—9:00 a. m. to 10:30 a. m.  
 Watauga—10:45 a. m. to 12:00 m.  
 Bluff City—12:15 p. m. to 2:00 p. m.  
 Vance—2:15 p. m. to 3:40 p. m.  
 Bristol—Night Meeting, 7:30 p. m.

Thursday, July 30.

Elizabethton—9:00 a. m. to 10:30 a. m.  
 Butler—11:30 a. m. to 1:00 p. m.  
 Maymead—1:35 p. m. to 2:45 p. m.  
 Mountain City—3:15 p. m. to 4:30 p. m.

CAROLINA, CLINCHFIELD & OHIO RAILROAD.

Friday, July 31.

Erwin—9:00 a. m. to 10:30 a. m.  
 Unicoi—10:50 a. m. to 11:45 a. m.  
 Normal—12:15 p. m. to 1:15 p. m.  
 Fordtown—2:00 p. m. to 2:30 p. m.  
 Kingsport—3:00 p. m. to 4:00 p. m.  
 Cameron—4:20 p. m. to 5:30 p. m.

SOUTHERN RAILWAY.

Saturday, August 1.

White Pine—8:30 a. m. to 9:15 a. m.  
 Newport—10:00 a. m. to 12:00 m.  
 Del Rio—12:20 p. m. to 1:30 p. m.  
 Wolf Creek—1:50 p. m. to 2:45 p. m.  
 Rogersville—Night Meeting, 7:30 p. m.

KNOXVILLE, SEVIERVILLE & EASTERN RAILROAD.

Monday, August 3.

Klondike—9:00 a. m. to 10:00 a. m.  
 Boyd's Creek—10:30 a. m. to 12:00 m.  
 Sevierville—12:30 p. m. to 2:30 p. m.

LOUISVILLE & NASHVILLE RAILROAD.

Tuesday, August 4.

Byington—9:45 a. m. to 11:00 a. m.  
 Edgmoor—11:20 a. m. to 12:15 p. m.  
 Coal Creek—1:00 p. m. to 2:00 p. m.  
 Jacksboro—2:30 p. m. to 3:30 p. m.  
 La Follette—3:45 p. m. to 5:00 p. m.

Wednesday, August 5.

Armona—8:00 a. m. to 9:30 a. m.  
 Maryville—10:00 a. m. to 12:00 m.  
 Louisville—12:45 p. m. to 1:45 p. m.  
 Friendsville—2:15 p. m. to 3:30 p. m.  
 Greenback—4:00 p. m. to 5:00 p. m.

## Thursday, August 6.

Vonore—9:00 a. m. to 10:00 a. m.  
 Madisonville—10:30 a. m. to 12:30 p. m.  
 Englewood—1:00 p. m. to 2:30 p. m.  
 Tellico Plains—3:30 p. m. to 5:00 p. m.

## Friday, August 7.

Etowah—9:00 a. m. to 11:00 a. m.  
 Benton—12:00 m. to 2:00 p. m.  
 Binfield—4:00 p. m. to 5:00 p. m.



Prof. M. W. Robinson



Dr. H. H. Shoulders.

## SOUTHERN RAILWAY.

## Saturday, August 8.

Concord—8:15 a. m. to 9:30 a. m.  
 Lenoir City—10:00 a. m. to 11:00 a. m.  
 Loudon—11:20 a. m. to 1:10 p. m.  
 Philadelphia—1:20 p. m. to 2:30 p. m.  
 Sweetwater—2:50 p. m. to 4:30 p. m.  
 Niota—4:50 p. m. to 5:30 p. m.

## Monday, August 10.

Athens—9:00 a. m. to 10:30 a. m.  
 Riceville—10:50 a. m. to 11:45 a. m.  
 Calhoun—12:05 p. m. to 1:00 p. m.  
 Tasso—1:20 p. m. to 2:20 p. m.  
 Cleveland—2:40 p. m. to 4:00 p. m.

## Tuesday, August 11.

McDonald—8:30 a. m. to 9:30 a. m.  
 Ooltewah—9:50 a. m. to 11:30 a. m.  
 Tyner—12:00 m. to 2:30 p. m.



NASHVILLE, CHATTANOOGA & ST. LOUIS RAILWAY.

Wednesday, August 12.

Whiteside—8:45 a. m. to 10:00 a. m.  
 Jasper—11:15 a. m. to 1:00 p. m.  
 Whitwell—1:30 p. m. to 2:30 p. m.  
 Dunlap—3:15 p. m. to 4:15 p. m.  
 Pikeville—Night Meeting, 7:30 p. m.

Thursday, August 13.

Sherwood—10:00 a. m. to 11:00 a. m.  
 Cowan—11:30 a. m. to 12:30 p. m.  
 Tracy City—1:30 p. m. to 3:00 p. m.  
 Coalmont—3:20 p. m. to 4:30 p. m.

Friday, August 14.

Decherd—9:00 a. m. to 10:00 a. m.  
 Winchester—10:15 a. m. to 11:30 a. m.  
 Belvidere—11:50 a. m. to 1:00 p. m.  
 Huntland—1:20 p. m. to 2:20 p. m.  
 Elora—2:40 p. m. to 3:40 p. m.  
 Fayetteville—4:30 p. m. to 5:30 p. m.

Saturday, August 15.

Howell—9:00 a. m. to 10:00 a. m.  
 Petersburg—10:20 a. m. to 11:30 a. m.  
 Lewisburg—12:15 p. m. to 2:00 p. m.  
 Bryant—2:30 p. m. to 3:30 p. m.

Monday, August 17.

Estill Springs—8:00 a. m. to 9:30 a. m.  
 Tullahoma—9:50 a. m. to 11:30 a. m.  
 Manchester—12:00 m. to 1:30 p. m.  
 McMinnville—2:30 p. m. to 4:00 p. m.

Tuesday, August 18.

Rock Island—9:00 a. m. to 10:00 a. m.  
 Quebeck—10:15 a. m. to 11:15 a. m.  
 Doyle—11:30 a. m. to 12:30 p. m.  
 Sparta—1:00 p. m. to 3:00 p. m.

Wednesday, August 19.

Normandy—9:00 a. m. to 10:00 a. m.  
 Wartrace—10:30 a. m. to 12:00 m.  
 Shelbyville—12:30 p. m. to 2:30 p. m.  
 Bell Buckle—3:00 p. m. to 4:00 p. m.  
 Christiana—4:30 p. m. to 5:30 p. m.

Thursday, August 20.

Murfreesboro—9:00 a. m. to 10:30 a. m.  
 Florence—10:50 a. m. to 11:45 a. m.

Smyrna—12:00 m. to 1:00 p. m.  
 Lavergne—1:15 p. m. to 2:15 p. m.  
 Antioch—2:35 p. m. to 3:30 p. m.

**Friday, August 21.**

Bellevue—9:15 a. m. to 10:15 a. m.  
 Kingston Springs—10:45 a. m. to 11:45 a. m.  
 Burns—12:20 p. m. to 1:20 p. m.  
 Dickson—1:35 p. m. to 3:00 p. m.  
 Nunnally—4:15 p. m. to 5:30 p. m.  
 Centreville—Night Meeting, 7:30 p. m.

**Saturday, August 22.**

Kimmins—8:45 a. m. to 10:00 a. m.  
 Hohenwald—10:20 a. m. to 12:30 p. m.  
 Allen's Creek—1:00 p. m. to 2:00 p. m.  
 Tennessee City—Night Meeting, 7:30 p. m.



**Dr. Olin West**



**Dr. L. P. Brown.**

**Monday, August 24.**

McEwen—9:00 a. m. to 10:00 a. m.  
 Waverly—10:30 a. m. to 12:00 m.  
 Denver—12:25 a. m. to 1:30 p. m.  
 Camden—2:00 p. m. to 3:30 p. m.  
 Rosser—4:15 p. m. to 5:30 p. m.

**Tuesday, August 25.**

Huntingdon—9:00 a. m. to 10:00 a. m.  
 McKenzie—10:35 a. m. to 12:00 m.  
 Gleason—12:25 p. m. to 1:30 p. m.  
 Dresden—1:50 p. m. to 3:00 p. m.  
 Martin—3:30 p. m. to 5:00 p. m.  
 Union City—Night Meeting, 7:30 p. m.

**Wednesday, August 26.**

Vale—9:00 a. m. to 10:00 a. m.  
 Mansfield—10:20 a. m. to 11:20 a. m.  
 Vandyke—11:35 a. m. to 1:30 p. m.  
 Whitlock—2:00 p. m. to 3:00 p. m.  
 Puryear—3:20 p. m. to 4:30 p. m.  
 Paris—Night Meeting, 7:30 p. m.

**Thursday, August 27.**

Buena Vista—9:00 a. m. to 10:00 a. m.  
 Westport—10:20 a. m. to 11:15 a. m.  
 Wildersville—11:45 a. m. to 12:30 p. m.  
 Lexington—1:00 p. m. to 2:30 p. m.  
 Huron—3:00 p. m. to 4:00 p. m.  
 Luray—4:15 p. m. to 5:15 p. m.

**Friday, August 28.**

Denmark—8:45 a. m. to 10:00 a. m.  
 Whiteville—10:45 a. m. to 11:30 a. m.  
 Somerville—12:15 p. m. to 1:45 p. m.  
 Oakland—2:15 p. m. to 3:15 p. m.  
 Cordova—4:00 p. m. to 5:00 p. m.

**SOUTHERN RAILWAY.**

**Saturday, August 29.**

Germantown—8:40 a. m. to 10:00 a. m.  
 Collierville—10:25 a. m. to 11:30 a. m.  
 Moscow—12:15 p. m. to 1:15 p. m.  
 Saulsbury—2:15 p. m. to 3:15 p. m.  
 Middleton—4:00 p. m. to 5:00 p. m.

**MOBILE & OHIO RAILWAY.**

**Monday, August 31.**

Selmer—8:30 a. m. to 10:00 a. m.  
 McNairy—10:30 a. m. to 12:00 m.  
 Finger—12:15 p. m. to 1:30 p. m.  
 Henderson—1:45 p. m. to 2:45 p. m.  
 Pinson—3:05 p. m. to 4:00 p. m.  
 Perry—4:20 p. m. to 5:30 p. m.

**Tuesday, September 1.**

Humboldt—9:00 a. m. to 10:30 a. m.  
 Fruitland—10:45 a. m. to 12:00 m.  
 Trenton—12:30 p. m. to 2:30 p. m.  
 Dyer—2:50 p. m. to 4:00 p. m.  
 Rutherford—4:15 p. m. to 5:00 p. m.  
 Kenton—Night Meeting, 7:30 p. m.

## ILLINOIS CENTRAL RAILWAY.

Wednesday, September 2.

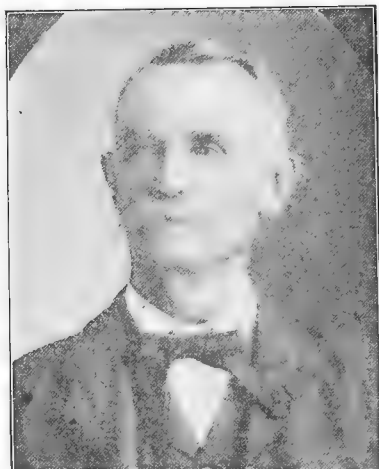
Obion—9:00 a. m. to 10:00 a. m.  
 Trimble—10:15 a. m. to 11:15 a. m.  
 Newbern—11:45 a. m. to 12:30 p. m.  
 Dyersburg—1:00 p. m. to 2:30 p. m.  
 Lenox—3:00 p. m. to 4:00 p. m.  
 Ridgely—4:30 p. m. to 5:30 p. m.  
 Tiptonville—Night Meeting, 7:30 p. m.

Thursday, September 3.

Halls—9:00 a. m. to 10:00 a. m.  
 Ripley—10:45 a. m. to 12:00 m.  
 Covington—1:00 p. m. to 2:30 p. m.  
 Brighton—3:00 p. m. to 4:00 p. m.  
 Kerrville—4:30 p. m. to 5:30 p. m.



Prof. J. W. Brister.



J. N. Meroney.

Friday, September 4.

Hickory Valley—9:00 a. m. to 10:00 a. m.  
 Bolivar—10:30 a. m. to 11:30 a. m.  
 Toone—11:50 a. m. to 1:00 p. m.  
 Medina—2:30 p. m. to 3:30 p. m.  
 Sitka—3:45 p. m. to 4:30 p. m.  
 Milan—Night Meeting, 7:30 p. m.

Saturday, September 5.

Bradford—8:30 a. m. to 9:30 a. m.  
 Greenfield—9:50 a. m. to 11:00 a. m.  
 Sharon—11:15 a. m. to 12:15 p. m.  
 Hillside—12:45 p. m. to 2:00 p. m.  
 McConnell—2:30 p. m. to 3:30 p. m.

BIRMINGHAM & NORTHWESTERN RAILROAD.

Monday, September 7.

Bells—9:00 a. m. to 10:30 a. m.  
 Alamo—11:00 a. m. to 12:30 p. m.  
 Crockett Mills—1:00 p. m. to 2:00 p. m.  
 Friendship—2:20 p. m. to 3:30 p. m.  
 Tigrett—3:45 p. m. to 5:00 p. m.

LOUISVILLE & NASHVILLE RAILROAD.

Tuesday, September 8.

Brownsville—9:15 a. m. to 10:30 a. m.  
 Stanton—11:00 a. m. to 12:00 m.  
 Mason—12:30 p. m. to 1:30 p. m.  
 Galloway—2:00 p. m. to 3:00 p. m.  
 Brunswick—3:30 p. m. to 5:00 p. m.

Wednesday, September 9.

Gadsden—9:00 a. m. to 10:00 a. m.  
 Gibson—10:30 a. m. to 11:30 a. m.  
 Atwood—12:00 m. to 1:00 p. m.  
 Trezevant—1:15 p. m. to 2:30 p. m.  
 Henry—3:30 p. m. to 4:30 p. m.

Thursday, September 10.

Springville—8:30 a. m. to 9:30 a. m.  
 Big Sandy—9:45 a. m. to 10:45 a. m.  
 Danville—11:15 a. m. to 12:15 p. m.  
 Tennessee Ridge—12:45 p. m. to 1:45 p. m.  
 Bear Springs—2:30 p. m. to 3:30 p. m.  
 Erin—4:30 p. m. to 5:30 p. m.  
 Cumberland City—Night Meeting, 7:30 p. m.

Friday, September 11.

Palmyra—9:00 a. m. to 10:00 a. m.  
 St. Bethlehem—10:45 a. m. to 12:00 m.  
 Adams—1:00 p. m. to 2:00 p. m.  
 Cedar Hill—2:15 p. m. to 3:00 p. m.  
 Springfield—3:20 p. m. to 4:30 p. m.  
 Goodlettsville—5:15 p. m. to 6:00 p. m.

Saturday, September 12.

Madison—9:00 a. m. to 10:00 a. m.  
 Gallatin—11:00 a. m. to 12:30 p. m.  
 Portland—1:10 p. m. to 2:00 p. m.  
 Hartsville—3:30 p. m. to 5:00 p. m.

Monday, September 14.

Franklin—8:50 a. m. to 10:30 a. m.

Ewells—11:10 a. m. to 12:10 p. m.  
 Columbia—1:00 p. m. to 2:00 p. m.  
 Lynnville—2:45 p. m. to 3:45 p. m.  
 Pulaski—4:30 p. m. to 5:30 p. m.  
 Prospect—Night Meeting, 7:30 p. m.

**Tuesday, September 15.**

Mt. Pleasant—8:30 a. m. to 9:30 a. m.  
 Summertown—10:00 a. m. to 11:00 a. m.  
 Ethridge—11:20 a. m. to 12:15 p. m.  
 Lawrenceburg—12:45 p. m. to 1:45 p. m.  
 Leoma—2:05 p. m. to 3:00 p. m.  
 Loretto—3:25 p. m. to 4:15 p. m.  
 St. Joseph—4:30 p. m. to 5:30 p. m.  
 Iron City—Night Meeting, 7:30 p. m.

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**CONSERVATION OF ALL PRODUCTS RAISED  
 ON THE FARM.**

For several years the United States Department of Agriculture has been devoting a great deal of time toward solving one of the most important questions before the American farmer and fruit grower today. This is the conservation of all products on the farm, letting nothing go to waste. Special trains with leading government experts in charge have been sent out through the country to demonstrate and lecture on the various ways by which the enormous waste of this country can be turned into profit. While many subjects of great interest were discussed there was, perhaps, nothing of greater importance than the subject of caring for the millions of dollars' worth of fruits and vegetables that go to waste every year, by the canning process.

The advisability of canning the surplus at home or on the farm, where produced, was explained by these experts and steam canning outfits were shown so that the farmers and their wives could see how easily this work can be done. As the heat of boiling water is not sufficient to properly sterilize such foods as vegetables, meats, fish and a few fruits, the steam pressure method of canning is almost unanimously endorsed by the experts in this line. With a steam-tight receptacle canned foods may be subjected to a much higher degree of heat, and the ferment germs totally destroyed.

Many parts of the country are organized into canning clubs under the supervision of government agents. They hold meetings at intervals and the children, as well as the older people, are taught how to successfully can all food products. Lectures are given at these meetings by the person in charge, and prizes are awarded for the most perfect goods. This work is rapidly extending into all the States, and in a year or so the entire country will be organized into "canning clubs."

The farmer and fruit grower have a great deal to thank the United States government for. Unlimited praise is due our government for the educational work that is being done, in helping the farmer to realize greater profits for his produce.



**DR. J. S. WARD, State Inspector of Apiaries.**

**TWOFOLD VALUE OF THE HONEYBEE.**

By J. S. WARD, STATE INSPECTOR OF APIARIES.

The majority of the people think that the only benefit humanity receives from bees is the production of honey and wax. This is a great mistake. The annual honey and wax harvest in Tennessee will approximate a half million dollars, and yet the bees have a value that is far greater than the wax and honey harvest. In the work of pollinating and cross-pollinating seed and fruit-bearing plants, so valuable to man, the bees do a work that has never been appreciated and yet has a value that is almost that of the fruit harvest itself.

In the transfer of pollen from stamens to stigmas, or from one blossom to another, the wind is an effective agent with many plants, provided it blows at the right time, in the right direction, and the



**Profitable Apiary**

pollen is ready to be thus scattered; but often this agent is non-effective on account of the pollen being too moist and sticky because of heavy dews, fogs or rain. Then the bees become the effective agents in carrying the pollen from flower to flower, a little sunshine between the showers will draw the busy workers from the hives and send them scampering into the flowers for that food—protein—which the bees must have for brood rearing.

It is during fruit blooming time that brood rearing is at its height and while the blooms yield the protein for the bees they in turn pollinate and cross-pollinate the blossoms. The bees feed their growing young on a balanced ration of honey and protein. The honey is gathered in the fall and stored away in considerable quantity, but



pollen or "bee-bread"—the protein-containing material—is not stored to any appreciable amount; it is practically gathered from day to day as needed. Much is needed in early spring, and Nature obliges the bees to crawl about over the blossoms of the fruit, gathering pollen and nectar for the maintenance of the colony, for self-preservation, and thereby inducing them to serve in pollinizing blossoms which would otherwise be unproductive of fruit or seed.

Bees seldom, if ever, visit flowers of different species on the same trip, but will visit different varieties of the same species. When peach trees are in bloom they stick closely to the peach blossoms; when apple blossoms are open they confine their labors to these. Even in nectar gathering the flavors and colors of the different honeys will be sharply outlined in the combs. We have a number of fruit-bearing plants where certain varieties are self-sterile, even where both male and female blossoms are on the same tree, as in the nut-bearing



**Old Fashion Unprofitable Hives.**

plants, or both sexes in the same flower, as in Gravenstein apple, for example. With these it is necessary to have pollen transferred from some other variety and perhaps from some distance away. Wind will not do it. Insects are the only means to fulfill this law of nature; and of all the insects only bees can be had in sufficient number so early in the season to do this great work.

Again, they are perfectly under the control of man. He can, by light feeding, stimulate them to brood-rearing sufficiently early in the spring to be assured of thousands of little pollinators of his fruit blossoms.

More and more is it being understood that the bees are a necessity for the growing of profitable crops of seeds and fruits; yes, and to such an extent that "if all the bees in the State were removed or killed many lines of agriculture would turn out to be dead failures instead of being extremely profitable ones as at present."

Is it a wonder, therefore, that people who know these things try so hard to preserve bees from destruction? Destruction by disease has taken a strong hold in the United States, and in some of the States has almost annihilated this priceless little insect. The layman may ask, Can this destruction be checked? The answer is easy. Bee diseases are understood and clearly defined. Their cures are simple and effective when intelligently and persistently administered. Educate all keepers of bees, for education means that disease will be recognized by each beekeeper and, being once recognized, is not difficult to cure.

However, to tell many beekeepers that bees are liable to disease is received with skepticism. To point out the dead and dying in the hive and urge treatment is regarded as useless and treated with indifference. Fortunate are we in Tennessee in having an apiary law, which not only provides for the education of people concerning bees in health, but provides for the inspection of diseased colonies and inflicts a reasonable punishment for inattention to treatment. Horticulturists, truck gardeners and beekeepers should all be united in their efforts to prevent the honeybee being destroyed by disease or by the careless spraying of fruit trees.

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### DO BEES INJURE FRUIT?

BY DR. H. A. SURFACE, STATE ENTOMOLOGIST OF PENNSYLVANIA.

"My attention has been called to a paragraph in the Middleburg Post, of Thursday, September 21, to the effect that 'keeping bees in town has become a nuisance, and a great annoyance to everybody who raises grapes,' and further suggested spraying with white hellebore in sweetened water.

"As a student of natural history, as well as from the standpoint of a beekeeper of many colonies, and years of experience, and also from the official position of President of the Pennsylvania State Beekeepers' Association, and State Zoologist of Pennsylvania, I feel it my duty to write a few words for publication, correcting two errors expressed or implied in this paragraph.

"(1) The bees do not puncture nor directly damage the grapes.

Wasps and yellow jackets do puncture them. The grape is thus opened and damaged, and would either be sucked dry by other insects, or it would shrivel and decay. It is true that after it is opened by the other insects, the honeybee will suck out the sweet juices, but I have tried several times placing bunches of sound and ripe grapes where the honey bees could reach them, and have found them in each case to be entirely uninjured. Thus the bees should not be blamed for the damage to the grapes, as they are not responsible for it.

"(2) The second error is the intimation that they should be sprayed with white hellebore and sweetened water. Even if this would kill the bees, it would be quite wrong to destroy creatures which are so beneficial as these are in carrying pollen from flower to flower, and in many cases being the only method of insuring pollinization in the flower, and the setting of the fruit bud. It would also be a decided moral wrong to destroy the bees, as they are not public property, but are the property of individuals, and I am satisfied that a person who kills or destroys the property of another can be held legally responsible for so doing.

"(3) A further error, however, is in the implied thought that such spraying will kill the bees. Indeed it will not. It will do no good whatever toward protecting the grapes from insects of any kind, and will neither kill the bees, nor wasps, nor yellow jackets that are causing the real trouble. An arsenical spray might kill them, but it would also kill the foliage to which applied. There is no known means of protecting the grapes from the attacks of the original culprits, but by all means let us disseminate truthful knowledge, and especially protect the bees for the good they do to the entire community."

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### COMBINING BEEKEEPING AND FARMING.

BY PORTER C. WARD.

READ BEFORE THE TENNESSEE BEEKEEPERS' ASSOCIATION, JUNE 30, 1914.

General farming and beekeeping, to my mind, make a perfect combination. Beekeeping combined with fruit growing, poultry raising or almost any specialized farming would work to an advantage. But that about which I wish to speak is general farming and beekeeping, since I can say without boasting that I have had some success with the combination. The two can be worked together almost without conflict, and very much to the advantage of the farmer both for pleasure and profit:

I am a grower of tobacco, wheat, corn, hogs, and all the products

generally found on the average farm in this section, yet I find time to give my bees all the necessary attention and that with very little conflict as a rule. Many farmers have ideal locations for bees and could with very little trouble have one of the most delightful and healthful sweets for his own table, and with a little more attention and care could handle colonies enough to materially help out financially. Enough time is generally wasted around the village store, postoffice or blacksmith shop to attend to a number of colonies.

One of the greatest objections that the farmer has against beekeeping is that he cannot afford to waste any time "fussing" with swarms. He would be willing to keep bees if he could place a few colonies in his orchard without having the everlasting swarming. This difficulty has been largely overcome by the use of hives made for



Home Apiary of Porter Ward.

the production of extracted or bulk comb honey and by giving room and ventilation to the colonies at the proper time.

Preparation for his crop can be made on rainy days in the winter time. Supers need cleaning, extracting combs overhauled, frames prepared for the production of bulk comb honey. Supplies for the coming season ought to be ordered and they can be put together at odd times during the winter. Hives need to be prepared to care for swarms, for you will have some swarming in spite of everything that can be done. Supers can be hauled to outyards and stacked up ready to be put on for the hoped-for harvest.

The above is a general outline of the work that I do each winter. As some of you know, I practice general farming, and to make a success of beekeeping and farming I have to utilize every spare moment and of course I have no time to spend loafing around the village postoffice or store. I find practically no conflict, the combination working

together almost perfectly. I have 114 colonies of bees and intend increasing to 160 the coming summer. This, with 275 acres of land, keeps me busy. Necessarily I must economize in every way possible that nothing be slighted.

But back to the preparation for the coming harvest. As above stated, everything that can possibly be done in the winter time, when farm work is a little slack, is given the necessary attention. In the spring all is in readiness and I can go about my general farm work with only an occasional glance at my bees, making sure that they have an abundance of stores. Nearer the honey flow, of course, bees require closer attention, but again we have very little conflict. I am up soon, directing my farm laborers for the day, looking after stock, etc., which takes my time until 8 or 9 o'clock; then I can be with my bees until about 3 p. m. And how little you will miss the time!



Out Yard of Porter Ward.

The village store, with its whittling crowd, may miss you, but it will be good for you financially and morally.

I produced something over 10,000 pounds of honey last year (1913), and all the help I had was what little I had my farm laborers do. Some help was necessary in hauling honey from outyards and in extracting. With this work with my bees I have successfully handled my farm. I put all my honey up in five-pound friction-top buckets, labeling each, and it sold readily at 15 cents a pound, or 75 cents a pail. This honey sold itself. Very little advertising was done. It was called for almost as fast as I could extract it from the combs.

There isn't a nicer combination than farming and beekeeping, and if you are a successful farmer and like bees and honey, try it. If you are not making good with your farm you have troubles enough without adding beekeeping to your already heavy responsibilities.

**REPORT OF THE STATE INSPECTOR OF APIARIES.**

*To the Commissioner of Agriculture, T. F. Peck.*

SIR: In compliance with section 10 of the Tennessee Apiary Law, I respectfully submit the following epitome of my official services for the year 1913.

The year 1913 was a very favorable one for the beekeepers of Tennessee, notwithstanding the severe drouth during the summer. The honey flow from white clover was an unusually heavy one over nearly the whole State, followed in many locations by a good fall flow from the aster bloom. The amount of honey and wax gathered can safely be estimated at \$300,000.00. The honey harvest was so great that most of the beekeepers are encouraged to increase their apiaries and many farmers are arranging to add beekeeping as a side line to their



**Apiary Inspection in Cumberland County.**

general farm work. About one farm in every nine have bees upon them; of the 250,000 farms in the State about 28,000 of them report beekeeping as a side line. The number of colonies in the State will approximate 200,000, which gives a valuation at only \$2.50 each of \$400,000.00. The great majority of these swarms, however, are kept in the old fashion box hives or "bee-gums." By transferring from these to the modern, scientific hive and keeping them after approved methods, the honey and wax returns could easily be brought up from \$225,000.00 to over \$1,000,000.00 annually.

The middle latitude of the State where extremes of temperature are seldom experienced, the varied and widespread honey-yielding flora, the abundant rainfall and the comparative freedom from the deadly foul brood diseases makes the outlook for Tennessee as a beekeeping State very flattering. Again, Tennessee is making rapid progress in her orchard and truck gardening industries, and in these

alone the honeybee is almost indispensable in the pollinization of fruit bloom. In this special work of carrying pollen the honeybee has a valuation greater than that of the honey harvest. The total annual value of this little insect to the people of Tennessee has been estimated to fall but little short of \$1,000,000.00. By education and development this valuation can easily be doubled and even more.

But much education is demanded to lead the people away from the old fashion, antiquated methods that result in no profit, to methods that make beekeeping worth while. To this end your Inspector of Apiaries has given much attention and labor. Lectures on practical beekeeping have been given during the year in over two-thirds of

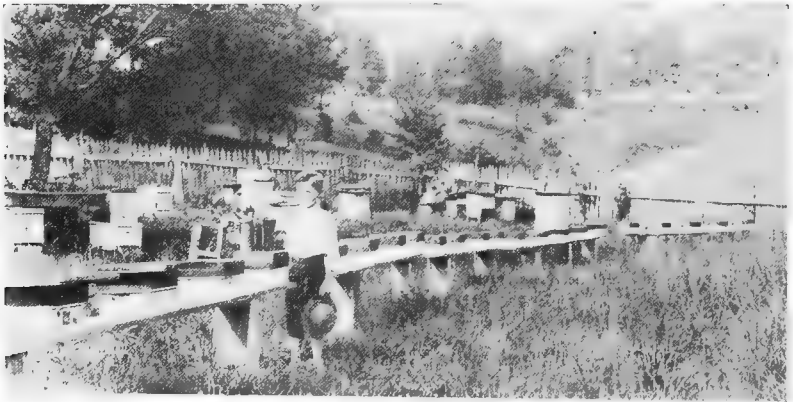


Queen Breeding Yard of J. S. Banks, Liberty, Tenn.

freely. During the month of August alone work was done in fourteen of the counties northeast of Nashville, which necessitated a travel of at least 1,200 miles over all kinds of roads in sections where railroads have not gone. Lectures, demonstrations, inspections and collecting names and addresses of beekeeping people made up the daily work. Over 2,500 people were reached and left stimulated to better things.

During the year the correspondence with beekeeping people was about double that of the previous year. More and more are the beekeepers realizing that the State is ready to help them with their troubles, and that in beekeeping there is one of the most profitable side the counties and literature on modern methods has been distributed lines of farm life. This correspondence was encouraged by prompt replies and the suggestions of how greater profits grow out of "knowing how."

The reports of contagious bee diseases were surprisingly few. The State is blessed in having so little of the foul brood diseases. However, these diseases are in the State and will spread rapidly until the industry will be ruined if not kept in check. In my lectures, literature and correspondence I urged the people to report their troubles, and to the calls that came in I gave the needed attention. During the year inspection work was done in 40 apiaries containing all together over 1,500 colonies. Disease was found in 23 of these apiaries and the orthodox treatment instituted as the cases demanded. In each case instruction as to symptoms, treatment, precautions, etc., were given as a safeguard in the future. The brood diseases were found almost exclusively around the cities and larger towns. To these places the diseases must have been carried from diseased districts in the mar-



Queen Breeding Yard of Curd Walker, Jellico, Tenn.

keted honey. To control this source of infection is an unsolved problem. Careful inspections were given the queen breeding yards of the State, which necessitated trips that extended from Cocke County in East Tennessee to Shelby County in West Tennessee. I am pleased to report all the queen yards free of disease.

Ignorance and bee diseases are at the foundation of all the beekeeper's troubles and "bad luck." Educate him in better methods; show him how to recognize diseases; teach him how to treat and guard against them, and real progress will have been made. Inspection work is of prime importance, still it should be the gateway for that educational work that will lead to a general betterment of the beekeeping industry.

Respectfully submitted,

DR. J. S. WARD,  
*State Inspector of Apiaries.*



## BROOD DISEASES OF BEES.

BY DR. J. S. WARD, STATE INSPECTORS OF APIARIES.

There are three known diseases of the brood, two of them very contagious, namely, "American Foul Brood" and "European Foul Brood," while the third, called "pickled brood," or "Sacbrood," is an infectious disease, and if allowed to go without attention sometimes causes serious losses.

## AMERICAN FOUL BROOD.

American Foul Brood is a disease caused by bacteria known to scientists as *Bacillus Larvae*. It reaches the healthy young larvae by means of infected food fed to them by the nurse bees. In most cases the larva dies *when nearly ready to seal up*, and most of the cells containing infected larvae are capped. The dead larva softens, settles to the lower side of the cell in a shapeless mass, at first *white or yellow*, changing to *coffee-color and brown*. At this stage it becomes

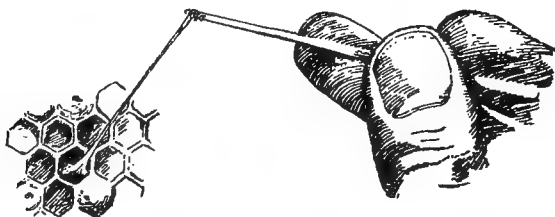


FIG. 3.—The ropiness of American foul brood. (Original.)

glutinous, so that if it is picked with a toothpick the contents will rope out half an inch or so when the pick is slowly withdrawn. It adheres to the cell so it cannot be lifted out entire. It has the odor of a poor quality of glue. When the larva dries it forms a tightly adhesive scale, of very dark brown color, which cannot be removed without tearing the cell wall.

"Pupae also may die of this disease, in which case they, too, dry down (fig. 2, *o, d*), become ropy, and have the characteristic odor and color. The tongue frequently adheres to the upper side wall, and often remains there even after the pupa has dried down to a scale. Younger unsealed larvae are sometimes affected. Usually the disease attacks only *worker brood*, but occasional cases are found in which queen and drone brood are diseased."—(*U. S. Dept. of Ag. Farmers' Bul. 442.*)

Where the infected larvae are capped the cappings turn a darker color and become flat or sunken; the workers, perceiving that something is wrong, usually start to tear off the capping, but, discovering the

condition of the contents, they generally leave it with a small perforation in the center until quite dry, then the capping is removed, and in time honey may be stored in the cells containing the scales of disease. The millions of disease spores then float out into the honey, which becomes a medium for carrying the disease to other healthy larvae by robbing, in the same or some other apiary. Some of the honey is also carried into the supers, to make room for alterations in the brood nest, and is marketed in the form of bottled or section honey. It goes into many homes, especially in towns and cities. The wooden sides of the sections, and many of the empty bottles, or

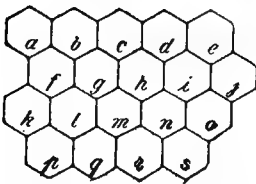
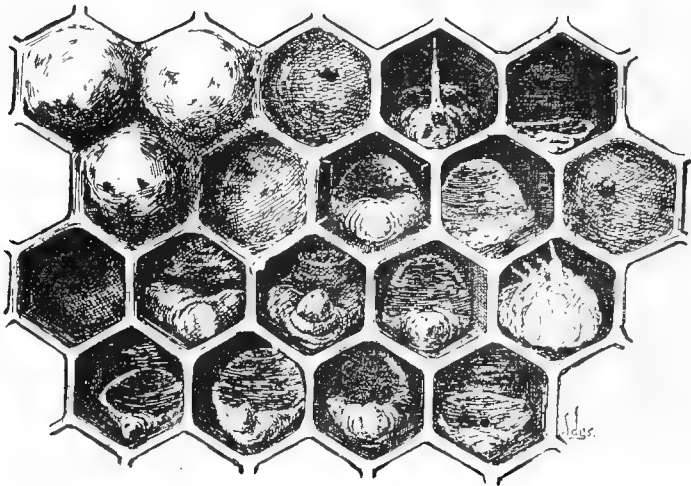


FIG. 2.—American foul brood; *a, b, f*, normal sealed cells; *c, j*, sunken cappings, showing perforations; *g*, sunken capping not perforated; *h, l, m, n, q, r*, larvæ affected by disease; *e, i, p, s*, scales formed from dried-down larvæ; *d, o*, pupæ affected by disease. Three times natural size. (Original.)

washings from them, are thrown out by housekeepers and cleaned up by bees of the neighborhood, and the disease is carried home to their healthy brood. This is why we find more disease in the apiaries around towns and cities than elsewhere.

#### TREATMENT.

The cause of American foul brood is found in a bacillus or micro-organism, which when once established is most easily transmitted in the honey. It develops and reproduces very rapidly. To be cured of this disease a colony must be *freed from all this infected brood*,

comb and honey. To do this we simply take it away. But in the operation some precautions are necessary. We must see that the colony will get healthy food as soon as the unhealthy food is taken away, and have means for building new comb at once. So the operation should be performed during a honey flow. The earlier the better, provided there is enough nectar to furnish the food. Treated early in the season the bees will have more time to build comb and store surplus. They may be treated later with equal success, but will have less time to gather surplus honey for winter stores, and may have to be fed. We must take precautions against starting robbing, or

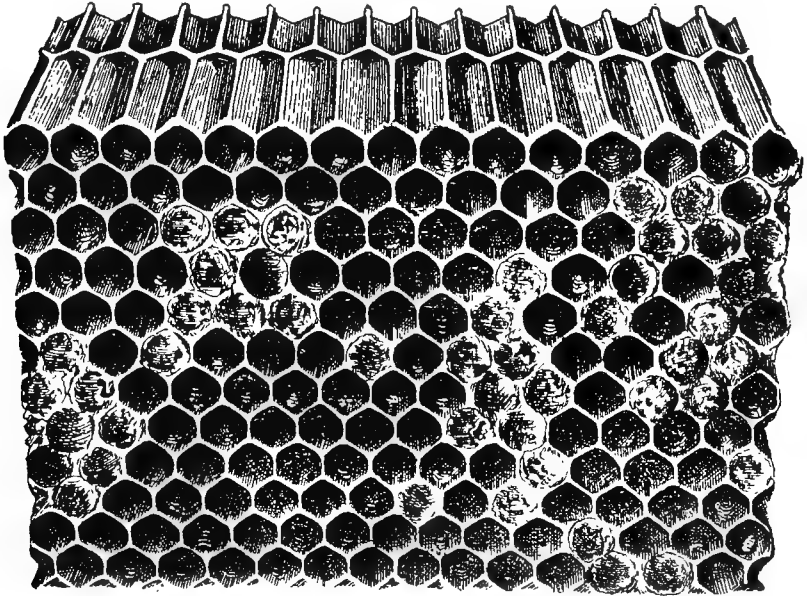


FIG. 4.—American foul-brood comb, showing irregular patches of sunken cappings and scales. The position of the comb indicates the best way to view the scales. (Original.)

causing the treated colony to scatter to other hives or swarm out, be lost, and carry infection to other places. So the operation should be performed in the evening when the bees are settling down for the night, and the entrance should be covered with queen-excluding metal to hold the queen in case of swarming out the next morning. A regular queen-excluder laid on the bottom board under the brood chamber will answer the latter purpose. Whenever bees are disturbed in their hives they will fill their honey sacs with honey from the comb. As this will happen when the hive is being treated, and some of this diseased honey might be stored in the new combs, it is necessary to

make them eat it before they can find a place to put it. To make sure of this not one bit of comb of any kind can be left in the hive. Even sheets of foundation are unsafe, as some cells can be so quickly drawn out enough to deposit a little infected honey. The hive must be quite empty so far as comb or foundation is concerned, except that a very narrow starter of foundation not more than one-half inch wide may be placed in the frames to indicate where the combs are to be built. Thus the diseased honey will be consumed in wax secretion before any of it can be deposited in the hive.

#### METHOD OF TREATMENT.

When there is a good honey flow on the colonies should first be prepared for treatment by removing from the hive every comb which does not contain brood. This will include all the super comb and probably two or more next the walls in the brood chamber. These must be put under cover immediately and destroyed as soon as possible. The remaining brood combs should be loosened and spread apart to facilitate rapid handling. When all colonies are thus prepared during the day it will be a short matter to finish the treatment in the evening.

When the bees have nearly stopped flying for the night each prepared colony is treated as follows: First remove it from its stand, then set in its place a clean, disinfected hive containing clean frames with one-half inch starters. If the queen is not clipped the entrance to this hive must be covered with queen-excluding metal. Now shake the bees from the combs of the old hive into the new; but if any fresh nectar flies out in shaking it will be necessary to brush instead of shaking, or make a runway to the hive of newspaper and shake the bees in front of the new hive. After the operation the soiled newspaper should be destroyed. In shaking in front of the hive the first one or two frames should be so shaken that the bees are thrown against the front of the hive, where they will quickly locate the entrance. Get these combs immediately under cover, and clean up very carefully any honey that may be around, so that robbers from healthy colonies cannot carry home disease.

When the diseased colonies are weak in bees, the bees of two or three should be put together into one clean hive so as to get a good sized colony with which to start the cure.

But in doing this diseased colonies must be united with their next-door neighbor, and not carried to another part of the apiary, as flying bees will be sure to return and may enter adjoining healthy colonies, carrying disease.

You have now made an artificial swarm of this colony. It must be given the conditions a new swarm likes, or it will leave and carry its disease to parts unknown, or perhaps into some healthy hive in the apiary. A new swarm likes plenty of ventilation and shade, and also plenty of clustering room. To satisfy this natural desire it is sometimes necessary to *place an empty hive under the one containing the starters* for a few days. This simple precaution will generally prevent the swarming out which so often happens in treating foul brood.

All combs from the supers as well as from the brood chamber of the diseased colony must be either burned or melted and boiled thoroughly before the wax is fit to use again. The honey that is removed is entirely unfit for bee feed and should be burned or buried deep enough to be out of the reach of any bees. This diseased honey could be saved, but it has very little value after the boiling required to disinfect it. It is absolutely safe for human consumption, but it is against the laws of many States to put such honey on the market, because of the danger of the empty receptacles being thrown out where the bees may have access to them and thus cause a new outbreak of the disease.

On the *third* evening after the first operation the starters and what combs have been built *must all be removed* by shaking or brushing off the bees as before. This time the bees should be given full sheets of foundation in a clean hive, and the cure is completed.

If directions have been followed carefully and thoroughly the treatment should be successful. To make sure, however, the brood must be examined again in about *three weeks* and again the following season. If the disease reappears in any colonies they can be treated again.

#### SAVING BROOD.

Brood from badly diseased colonies is of no value, and dangerous, and should be burned, buried or otherwise destroyed at once. Brood from colonies having only a few cells diseased may be placed over an average colony slightly diseased, and the queen caged. In ten days treat as given above.

#### SAVING COMB.

It is never safe to use super-combs that have been on diseased colonies. Even though they may appear white and clean, germs of the disease are apt to lurk in them from year to year. To melt these down is no serious loss, as the wax will more than make foundation for new ones.

## CAVING FRAMES.

Frames may be cleaned by boiling in water for an hour, but this frequently causes them to warp badly.

## SAVING HIVES.

Hives which have formerly contained diseased colonies, or in which diseased combs have been stored or carried, should be burned over inside with a gasoline or oil torch.

## FALL TREATMENT.

If the disease is discovered late in the season, and the colony is still strong, *leave it until November*, take the diseased combs away, and supply honey from a healthy colony, in full sealed combs. *Be sure that the combs are all sealed, and that they are from a colony which has no disease.*

If the colony is not strong enough to be worth this treatment it should be destroyed at once, as one great source of spread is the spring robbing out of combs left by the winter death of such colonies.

## EUROPEAN FOUL BROOD.

The best description of this disease which has been published is found in U. S. Department of Agriculture Farmers' Bulletin 442, "The Treatment of Bee Diseases," by E. F. Phillips, Ph.D. It is as follows: "European foul brood was formerly called 'black brood,' or 'New York bee disease.' The name 'black brood' was a poor one, for the color of the dead brood is rarely black, or even very dark brown. European foul brood usually attacks the larva at an earlier stage of its development than American foul brood, and while it is still *curled up at the base* of the cell (Fig. 4, *r*). A small percentage of larvae dies after capping, but sometimes quite young larvae are attacked (Fig. 4, *c, m*), sunken and perforated cappings are sometimes observed, just as in American foul brood (Fig. 2, *c, g, j*). The earliest indication of the disease is a slight yellow or gray discoloration and uneasy movement of the larva in the cell. The larva loses its well-rounded, opaque appearance and becomes slightly translucent, so that the tracheae may become prominent (Fig. 4, *b*), giving the larva a clearly segmented appearance. The larva is usually flattened against the base of the cell, but may turn so that the ends of the larva are to the rear of the cell (Fig. 4, *p*), or may fall away from the base (Fig. 4, *c, g, l*). Later the color changes to a decided yellow or gray and the translucency is lost (Fig. 4, *q, h*). The yellow color may be taken as the

chief characteristic of this disease. The dead larva appears as a moist, somewhat collapsed mass, giving the appearance of being melted. When the remains have become almost dry (Fig. 4, c), the tracheae sometimes become conspicuous again, this time by retaining their shape, while the rest of the body content dries around them. Finally all that is left of the larva is a grayish-brown scale against the base of the cell (Fig. 4, f, h), or a shapeless mass on the lower side wall if the larva did not retain its normal position (Fig. 4, n, o). Very few scales are black. The scales are *not adhesive*, but are *easily removed*, and the bees carry out a great many in their efforts to clean house.

“Decaying larvae which have died of this disease are usually not ropy as in American foul brood, but a slight ropiness is sometimes

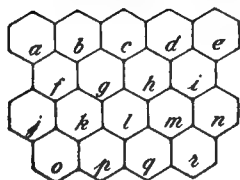
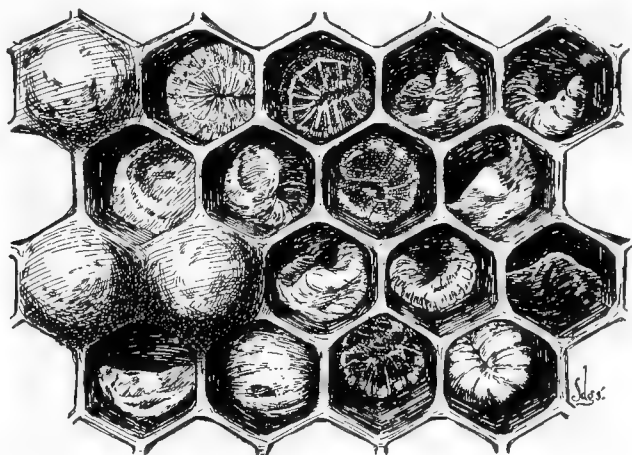


FIG. 5.—European foul brood: a, j, k, normal sealed cells; b, c, d, e, g, i, l, m, p, q, larvæ affected by disease; r, normal larva at age attacked by disease; f, h, n, o, dried-down larvæ or scales. Three times natural size. (Original.)

observed. There is usually little odor in European foul brood, but sometimes a sour odor is present, which reminds one of yeast fermentation. This disease attacks drone and queen larvae almost as quickly as those of the workers. The tendency of this disease to attack queen larvae is a serious drawback in treatment. Frequently the bees of a diseased colony attempt to supersede their queen, but the larvae in the queen cells often die, leaving the colony hopelessly queenless. The colony is thus depleted very rapidly.

"European foul brood is *more destructive during the spring and early summer* than at other times, *often entirely disappearing* during late summer and autumn, or during a heavy honey flow. Italian bees seem to be better able to resist the ravages of this disease than any other race. The disease at times spreads with startling rapidity and is most destructive. Where it is prevalent a considerably larger percentage of colonies is affected than is usual for American foul brood. This disease is very variable in its symptoms and other manifestations and is often a puzzle to the beekeeper."

#### TREATMENT.

This disease is now thought to be transmitted through the queen and brood. Pure-bred heather-colored Italian bees are almost immune to European foul brood. Therefore the best plan yet found is to first make the disease colony queenless, then after twenty-one days give the colony a young, laying Italian queen or a ripe queen cell of Italian stock. The bees, anxious to have clean combs for brood, will take out the dead brood, clean up the cell, and soon there will be full combs of healthy brood.

#### SACBROOD.

A disease slightly resembling foul brood is called by some "Starved Brood," and by others "Pickle Brood." It has recently been described and named "Sacbrood" by Dr. White of U. S. Department of Agriculture. The most positive difference in the diagnosis of this disease is the absence of ropiness and of the pot-glue smell which is always found in American foul brood.

In sacbrood the larva decays *from the inside*, leaving the skin tough and in its natural shape; in European foul brood or American foul brood the skin of the larva softens as the contents become glutinous and all the natural wrinkles become smooth as the mass settles to the lower side of the cell. In sacbrood the larva often dries up so as to become loose in the cell and fall out when the comb is inverted. In American foul brood it always cements fast to the lower cell wall so it cannot be removed without tearing the cell. European foul brood attacks the larva generally at an earlier stage in its existence than sacbrood.

"Sacbrood is an infectious disease of the brood of bees caused by an infectious agent so small or of such a nature that it will pass through the pores of a Berkefeld filter."

#### TREATMENT.

Requeening with a vigorous young Italian queen will effect a cure.



**TENNESSEE BEEKEEPERS' ASSOCIATION,  
NASHVILLE, JANUARY 30.**

BY J. M. BUCHANAN, SECRETARY.

A most interesting and instructive meeting of the Tennessee Beekeepers' Association was held at Nashville on January 30, with perhaps the best attendance in the history of the association. Papers and addresses on vital topics, together with lively discussions, took up the entire day.

The opening address was by the President, Mr. J. M. Davis, of Spring Hill, whose subject was "The Bee as Man's Coworker." He gave an outline of the history of beekeeping, and showed the value of the work of the bees, both in the production of honey and wax, and in their aid in the fertilization of fruit-bloom. He pointed out the fact that the apricot is the only stone fruit that is not dependent on the bees or other insects for the proper pollination of its blossoms.

"Fancy Comb Honey in Spite of Foul Brood" was the subject of a talk by L. F. Watkins, of Nashville. Mr. Watkins told how, in addition to managing a farm of 200 acres, he had cleaned up an apiary of nearly 100 colonies badly affected with American foul brood, and at the same time had produced a good crop of fancy comb honey.

In a discussion on marketing honey a number of good points were brought out, and emphasis was given to the need of proper grading and packing, and also to the advantage of holding up the price. It was shown that it is folly to spend time and labor producing a crop of nice honey and then selling for whatever the merchant offers. There is a demand for all our products in the local markets, and at good prices.

Another discussion was in regard to controlling swarming. It seems that most of the members just "let 'em swarm," as that seems to be the easiest way to "control" swarming. It was pointed out that, in the production of comb honey, with prolonged and intermittent flows such as we have, there is no satisfactory method of prevention of swarming. It is, perhaps, as well to allow them to swarm once, and then throw the strength of the colony to the swarm. When working for extracted honey it is a much easier matter, as was stated by B. G. Davis, as the use of young queens, plenty of storage room, particularly of drawn combs, and good ventilation, would go a long way toward solving the problem.

Mrs. Mira Tandy, of Nashville, gave an address on "Beekeeping as a Supplemental Course in the Public Schools." She favored the or-

ganization of beekeeping clubs among the boys and girls, after the manner of the boys' corn clubs. Such clubs would create an interest in beekeeping, and she thought would help to keep the boys and girls on the farm.

Dr. J. S. Ward, State Apiary Inspector, gave a review of the inspection work for the past season. He said there was a marked improvement in the foul-brood situation in the State, and that with proper care the disease could be kept under control. Dr. Ward spoke of the symptoms, and gave the methods of treatment recommended for the disease. He showed that the introduction of a hardy strain of Italian stock is essential in the cure of European foul brood. As for sacbrood, he thought a change of queens all that was needed, although this had not been thoroughly tested. He said he had seen whole apiaries wiped out by sacbrood.

A paper by Porter Ward, of Elkton, Ky., was read, in which he told of producing ten thousand pounds of honey from 100 colonies, besides running a farm of 150 acres. This was bulk comb honey, and, by the way, this seems to be quite a popular way of packing honey in this State.

The following officers were elected for the ensuing year: President, T. J. Ayers, Cedar Hill; Vice-President, W. B. Romine, Pulaski; Secretary, J. M. Buchanan, Franklin. Dr. J. S. Ward and J. M. Buchanan were selected as delegates to the national convention at St. Louis.

After the convention adjourned, an hour was spent in a general social chat, which was enjoyed by all.

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### **SOME NECTAR AND POLLEN-BEARING PLANTS OF TENNESSEE.**

By J. M. BUCHANAN, FORMER STATE INSPECTOR OF APIARIES.

It is essential that the beekeeper have some knowledge of the flora of his locality in order to get the best results from his beekeeping operations. He should know when to expect a honey-flow, and be able to tell with some certainty how long a flow will last, and what quality of honey he is likely to get from a certain source. Then he will know when to make his increase, when to expect swarms, when to put on supers, etc.

The character of the honey-producing flora and the date of bloom depend on the soil, the season, and the altitude. A list of plants that will be found in one place may not apply at all to a location not very far distant.

In Tennessee there is great variation in soil and in altitude, the latter ranging from about 300 feet in the Mississippi Valley to over 6,000 feet in the mountains of East Tennessee; hence it will be impossible to give the exact dates of bloom of the plants in this list. It would seem, from a casual reading of the list, that we had a continual flow from early in the spring until frost, but such is not the case for any given locality. This will be better understood from the following general summary of conditions:

The Tennessee River crosses the State twice, and the Cumberland makes a long curve through the central section, and in these valleys white and alsike clovers, and, in many places, black locust, form the principal source of surplus honey. On the ridges and tablelands of the central and eastern sections, the honey is from poplar, sourwood, and wild flowers of many species. On the plains of the western part of the State, and in the Mississippi Valley cotton gives the greatest surplus.

The following list is by no means complete, although it gives the most important honey and pollen-bearing plants of the State, with their approximate date of blooming.

Soft maple, *Acer rubrum*, February, March. Pollen and nectar. First help to brood-rearing. Valleys.

Elm, *Ulmus americana*, March. Pollen.

Sugar maple, *Acer saccharinum*, March, April. Sweet sap; nectar, pollen.  
Dandelion, *Taraxacum officinalis*, February to June. Nectar.

Peach, *Amigdalus persica*, March, April. Nectar, pollen.

Plum, *Prunus domesticus*, April. Some nectar and pollen.

Turnip, *Brassica rapa*, April. Sometimes gives surplus where grown for seed.

Redbud, *Cercis canadensis*, March, April. Nectar, pollen.

Apple, *Malus*. Nectar, pollen. Valuable for brood-rearing.

Black locust, *Robinia pseudacacia*, April, May. Good yielder of fine honey; slow to granulate.

Yellow-wood, *Virgilia lutea*, May. Some surplus where abundant.

Poplar, *Liriodendron tulipifera*, May. Heavy yielder. Honey amber, but good flavor.

Alsike clover, *Trifolium hybridum*, May to July. Almost equal to white clover. Central and east.

White clover, *Trifolium repens*, May, June. Principal source in central and eastern valleys. Honey white.

Persimmon, *Diospiros virginiana*, May. Honey dark. Uplands.

Linden, *Tilia americana*, July. Honey white, good yielder. Central and eastern valleys.

Sourwood, *Oxydendron arboreum*, July. Uplands. Good honey, almost entirely free from granulation.

Cow-pea, *Vigna sinensis*, July, August. Some honey, mainly from extra floral glands.

Milkweed, *Asclepias*, several species, July, August. Some honey; sticky pollen.

Horsemint, *Monarda clinopodioides*, July. Some surplus in western and central valleys.

Indian corn, *Zea mays*, July, August. Pollen and some nectar.

Ragweed, *Ambrosia aptera*, July, August. Heavy bearer of pollen.

Smartweed, *Persicaria mite*, August. Light-amber honey of good flavor.

Lowlands.

Sumach, *Rhus capolina*, August. Some surplus. Uplands.

Buckbush, *Symphoricarpos vulgaris*, August. Sometimes gives surplus.

Honey, amber.

Cotton, *Gossypium herbaceum*, July to September. Good yielder in western counties.

Bitterweed, *Helenium tenuifolium*, August, September. Amber honey, very bitter. West.

Holly, *Ilex glabra*, July, August. Honey, dark. West.

Boneset, *Eupatorium perfolia*, August. Yields heavily along northern border of the State.

Laurel, *Kalmia latifolia*, July, August. Eastern mountains.

Goldenrod, *Solidago*, several species. September. Pollen.

Aster, *Aster*, several species. September, October. Honey, amber; strong in flavor, quick to granulate. Good for winter stores.

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## WOOD AND LUMBER.

A cord of wood contains 128 cubic feet. To ascertain how many cords there are in a pile of wood, multiply the length by the height, and that by the width, and divide the product by 128.

One-fifth more siding and flooring is needed than the number of square feet of surface to be covered, because of the lap in the siding and matching.

To measure round timber, take the girth in inches at both large and small ends, add them, divide by 2, which gives the mean girth; then multiply the length in feet by the square of one-fourth of the mean girth and the product will be the contents in cubic feet. This rule is commonly adopted, and gives four-fifths of the true contents, one-fifth being allowed to the purchaser for waste in sawing.

One thousand laths will cover 70 yards of surface, and 11 pounds of lath nails will nail them on. Eight bushels of good lime, 16 bushels of sand and 1 bushel of hair will make enough good mortar to plaster 100 square yards.

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Scaly Legs—Apply vaseline to affected parts, and after twenty-four hours soak in warm, soapy water. Repeat treatment until cured.

**STOCK RAISING IN TENNESSEE.**

The Agricultural Department at Washington, in bulletins sent to the public, shows much apprehension for the effect of the drouth that has prevailed in the West is going to have on the supply of beef cattle. The fear is apparent that there is going to be a material increase in the price of meat. The increase in meat prices has been so continuous and so persistent for several years that the public will not be surprised at further advances, and being thus promptly advised of what to expect, the people may make such preparations as may be indicated for meeting the emergency.

It is noted that the information has been received in the South with a tone of hopefulness, at least in the newspaper press. For years the Southern States have been neglecting the feature of cattle raising, once a profitable part of the farmer's annual output. A widespread call is being made upon the Southern farmer that he again become a cattle raiser.

Commissioner of Agriculture Peck, who has given the subject much study, is sure that the raising of stock in Tennessee, included in which is the raising of beef cattle and sheep, is one of the manifestly profitable openings the farmer has for making money. Tennessee has large areas of waste lands that properly cultivated could in a few years be made into rich grazing lands. This State is subject to no prolonged drouths and its climatic conditions are altogether favorable to cattle raising. The diseases to which stock is susceptible may be easily controlled with the proper care and attention, and the only drawback lies in the apparent indifference of the farmer to the means and methods, so easily accessible, for redeeming his worn-out lands for the purposes of pasture.

Experiments with alfalfa are going forward in many sections, and while results have not been as immediately satisfactory as were hoped for, there isn't the slightest reason for doubting that with proper care, patience and determination, it may be made one of the staple crops of this region.

At any rate, the conditions offer the people of Eastern Tennessee a magnificent opening for increasing the money value of their holdings by a generous experiment in the production of meat cattle.—*Chattanooga Times*.

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Bowel Trouble in Chicks—Well-boiled rice mixed with a little charcoal will often check this complaint.

**CAUSE OF MANY FAILURES.**

The Illinois station gives among the causes of failure in the poultry business the following:

Endeavoring to keep too many fowls where room for one only can be obtained; that is saving in expenses by cheapening cost of houses and space.

Buying fowls from other farms and thus bringing disease and lice into the flocks.

Overfeeding, the fowls being supplied with greater abundance under the supposition, the more feed the more eggs.

Cold draughts over the fowls at night, with a view to supplying fresh air, when the temperature is low.

Wasting time with sick fowls instead of destroying all birds that can not be cured quickly.

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**CROP REPORT FOR JUNE.**

**T. F. Peck, Commissioner, Department of Agriculture,  
Nashville, Tenn., July 1, 1914.**

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Reports from crop correspondents throughout the State for the crop month ending June 20 indicate that at that time a large section of the State was badly in need of rain, pastures had been badly damaged, and the hay crop was cut very short. Since the mailing of the reports by correspondents there has been rain in some sections where it was badly needed by early corn and gardens.

A fine wheat crop has been harvested in the State, the reports showing a percentage of 88, which would indicate an average production to the acre in the State of about 18 or 19 bushels. The production per acre will be reported on next month.

The corn crop had not suffered to any extent from the dry weather, but had reached that stage where it was beginning to need rain. The corn crop in the State will depend to a great extent on general rains in the next few days.

Cotton is also needing rain and the condition of the crop in the cotton section of the State at the present time is only fair.

Tobacco will also be a short crop this year on account of lack of seasonable weather for planting. The acreage is about the same as last year.

The acreage in Irish potatoes for the first crop is below normal, and the yield will be cut short on account of dry weather. The acreage in sweet potatoes will be about up to the average.

Apples and peaches will show a larger yield than last year. Grapes also indicate a fine yield.

Peanuts show indications of an average yield. The condition of alfalfa is fair wherever a stand has been obtained.

The general condition of live stock in the State is good. Hog cholera is quite prevalent, but not more so than usual at this season of the year. Many farmers in different sections of the State have protected their hogs by the use of anti-hog cholera serum, and the use of serum is on the increase, and it is probable that the loss of hogs by this disease will be considerably lessened in Tennessee next year. Pink-eye in cattle appears to be unusually prevalent for this early in the season. A few isolated outbreaks of black leg have been reported, and one outbreak of anthrax in Shelby County last month.

Below is given the summary, for comparison, of the reports of the Department for the month of June, 1913, and 1914:

	1913. Per Cent.	1914. Per Cent.
Cotton, acreage .....	93	95
Cotton, condition .....	81	77
Wheat, estimated yield (bushels).....	17	19
Garden, condition .....	82	65
Oats, estimated yield (bushels).....	27	18
Young clover, condition.....	69	66
Meadow grasses, condition.....	73	63
Millet, acreage .....	80	70
Corn, acreage .....	92	89
Corn, condit'on .....	83	82
Tobacco, acreage .....	86	65
Tobacco, condition .....	76	65
Apples, condition .....	55	74
Peaches, condition .....	50	67
Grapes, condition .....	84	81
Stock Peas, acreage .....	83	76
Irish Potatoes, acreage .....	84	84
Irish Potatoes, condition .....	83	64
Sweet Potatoes, acreage .....	88	80
Tomatoes, acreage .....	86	81
Tomatoes, condition .....	82	75
Peanuts, acreage .....	77	72
Peanuts, condition .....	79	77
Live Stock, condition .....	89	88
Alfalfa, condition .....	87	79

JUNE CROP REPORT FOR 1914—T. F. PECK, Commissioner of Agriculture

DISTRICT.	COUNTY.	Cotton—acreage.	Cotton—condition.	Wheat—yield, per cent.	Garden—condition.	Cats—yield, per cent.	Young Clover—condition.	Grasses—condition.	Millet—acreage.	Corn—acreage.	Corn—condition.	Tobacco—acreage.	Tobacco—condition.	Apples—condition.	Peaches—condition.	Grapes—condition.	Stock Peas—acreage.	Irish Potatoes—acreage.	Irish Potatoes—condition.	Sweet Potatoes—acreage.	Tomatoes—acreage.	Tomatoes—condition.	Peanuts—acreage.	Peanuts—condition.	Live Stock—condition.	Alfalfa—condition.	
A	Lake	100	85	60	60	80	80	80	75	85	80	50	85	85	60	95	90	100	70	90	90	100	90	85	90	85	
	Chobon	100	75	80	85	75	60	70	100	100	85	40	50	60	70	80	100	90	90	80	100	100	75	80	100	75	
	Dyer	100	75	100	80	60	60	85	100	100	75	100	100	95	50	60	85	100	50	80	80	100	100	100	100	100	100
	Lauderdale	95	85	50	90	85	75	85	100	100	70	100	100	60	65	60	100	90	90	100	100	100	90	100	100	100	95
	Tipton	100	75	100	85	75	75	75	25	100	85	85	100	85	60	60	100	90	90	75	100	100	90	100	100	100	100
B	Wakley	100	85	75	90	80	80	60	85	95	85	40	50	60	60	100	100	85	85	90	90	70	100	85	80	95	
	Gibson	90	85	85	90	85	75	30	85	95	70	100	100	50	50	40	90	90	70	60	95	75	50	75	90	75	
	Crockett	90	75	50	60	60	60	100	100	100	75	100	95	40	40	100	100	100	90	100	100	100	90	95	100	100	
	Madison	90	80	90	95	100	95	100	100	100	100	100	100	40	40	100	100	100	90	100	100	100	90	95	100	100	
	Haywood	60	50	60	60	65	60	60	65	100	60	60	100	100	70	75	85	85	75	80	75	60	100	100	75	85	
Upland Section of West Tennessee.	Hardeman	90	75	75	75	80	75	75	95	90	70	100	100	25	25	75	80	75	80	75	75	60	100	100	85	75	
	Fayette	90	80	45	80	85	80	50	75	85	65	40	85	40	40	85	90	75	35	50	65	80	85	85	85	85	
	Henry	95	70	90	85	90	85	85	100	100	20	40	85	85	85	100	90	75	85	100	75	50	75	85	100	85	
	Carroll	70	85	70	85	55	60	55	70	70	70	100	100	60	60	40	80	90	70	100	100	100	75	100	85	85	
	Henderson	100	90	90	90	85	90	85	85	100	90	100	100	80	80	100	100	100	100	100	100	35	50	75	90	85	
C	Chester	100	90	75	75	50	50	45	90	85	85	100	100	25	25	75	65	80	30	30	100	50	75	60	85	85	
	McNairy	75	70	65	65	50	50	50	75	100	85	100	100	85	85	90	100	100	50	100	100	50	75	60	90	90	
	Benton	100	75	60	60	50	50	50	75	100	85	100	100	85	85	90	100	100	50	100	100	50	75	60	90	90	
	Decatur	85	75	75	75	60	60	60	60	75	75	100	100	100	100	100	100	60	60	60	60	60	60	70	90	85	
	Hardin	85	75	75	75	60	60	60	60	75	75	100	100	100	100	100	100	60	60	60	60	60	60	70	90	85	
Western Section of Middle Tennessee.	Ferry	90	80	100	70	60	60	60	100	100	90	80	100	100	40	40	100	100	80	85	75	70	50	80	90	80	
	Humphreys	95	95	85	85	80	85	80	100	100	90	80	100	85	70	85	100	80	80	80	85	80	80	70	90	90	
	Houston	80	70	40	50	30	70	75	75	80	75	80	60	60	80	60	75	25	50	50	90	100	60	80	80	80	
	Stewart	95	75	90	90	60	95	50	60	95	85	50	60	60	60	60	50	60	70	60	90	100	60	80	80	80	
	Montgomery	70	85	90	90	100	75	100	100	75	90	70	50	60	60	60	60	90	40	40	100	50	100	100	100	80	
Western Section of Middle Tennessee.	Robertson	70	70	70	50	90	90	75	100	100	100	100	100	100	100	75	20	90	40	40	100	100	100	100	100		
	Sheatham	100	80	75	50	75	100	100	100	100	100	50	100	100	100	75	100	100	100	100	100	50	100	100	100	100	
	Dickson	85	60	65	60	60	60	60	60	70	70	55	55	65	65	70	75	75	65	65	70	60	60	70	90	85	
	Hickman	90	60	60	60	60	60	60	60	70	100	90	55	55	75	70	75	75	90	75	90	50	100	100	90	85	
	Lewis	90	60	60	60	70	100	100	100	100	100	90	55	55	75	70	75	75	90	75	90	50	100	100	90	85	
Wayne	100	100	50	50	50	100	100	100	100	100	90	50	50	100	100	100	100	100	100	100	60	60	70	90	85		
Lawrence	100	100	50	50	50	100	100	100	100	100	90	50	50	100	100	100	100	100	100	100	60	60	70	90	85		



Summer	100	75	100	50	50	85	95	90	60	50	75	80	80	85	90	40	90	90	85	85
Trousdale	90	40	75	80	70	70	90	85	85	70	50	65	80	25	80	25	80	100	70	85
Davidson	85	40	20	65	40	75	100	85	80	60	70	75	80	50	85	100	100	100	70	90
Wilson	95	60	50	40	40	75	100	85	100	100	50	70	100	100	100	80	80	60	75	90
Williamson	90	75	85	40	40	80	100	80	100	40	50	80	75	100	40	100	100	80	75	65
Rutherford	90	75	85	40	40	80	100	80	100	40	50	80	75	100	40	100	100	80	75	65
Cannon	100	100	75	100	90	100	100	100	100	70	75	100	100	50	50	100	100	100	100	100
Mauzy	95	75	75	75	75	75	100	100	75	75	75	75	75	50	50	80	100	100	100	100
Marshall	90	70	20	50	60	75	90	95	90	60	90	30	40	45	45	70	90	40	100	85
Bedford	90	90	30	75	60	65	40	90	85	80	70	50	80	70	70	90	40	90	100	70
Giles	70	80	80	80	80	60	100	90	85	90	100	70	100	70	70	70	90	40	90	85
Lincoln	90	85	70	65	60	60	100	90	80	60	90	100	70	70	70	70	90	40	90	85
Moore	90	85	70	65	60	60	100	90	80	60	90	100	70	70	70	70	90	40	90	85
Macon	95	85	50	65	80	70	90	90	90	75	70	85	65	50	50	85	85	85	80	85
Clay	100	75	50	85	50	90	100	75	75	85	75	85	95	60	95	60	95	60	95	85
Pickett	100	80	75	95	40	75	90	100	100	75	75	70	65	60	65	60	65	60	65	90
Overton	100	100	85	85	90	100	100	100	100	85	85	65	90	100	100	100	100	100	100	80
Jackson	100	75	30	75	90	100	100	100	100	25	75	100	100	85	85	85	100	100	100	80
Smith	100	60	70	50	60	100	100	80	80	90	75	60	75	80	80	80	100	90	100	100
Putnam	100	80	60	82	80	80	80	80	80	60	90	90	70	50	80	50	80	70	80	90
DeKalb	100	80	60	25	75	75	80	80	80	80	90	85	60	60	60	60	60	60	60	95
White	85	50	80	25	75	75	80	80	80	80	90	25	90	75	75	75	75	75	75	70
Warren	85	70	60	60	60	80	95	90	90	40	50	75	100	55	60	60	60	60	85	70
Coffee	100	60	40	30	60	40	100	100	90	40	50	75	100	55	60	60	60	60	85	70
Grundy	100	60	40	30	60	40	100	100	90	40	50	75	100	55	60	60	60	60	85	70
Franklin	100	90	60	60	10	10	100	90	90	100	90	90	100	75	75	75	75	75	75	80
Scott	95	60	30	25	50	50	100	95	90	80	80	60	100	75	75	75	75	75	75	75
Fentress	95	60	30	25	50	50	100	95	90	80	80	60	100	75	75	75	75	75	75	75
Morgan	90	90	95	90	95	80	100	100	95	80	80	80	90	100	100	100	100	100	100	75
Cumberland	100	80	50	70	75	80	100	100	95	80	75	75	75	80	80	80	80	85	85	100
Van Buren	95	90	90	85	85	75	100	95	100	75	70	60	75	80	80	90	95	85	90	100
Campbell	80	80	90	75	75	75	100	75	100	75	70	60	75	80	80	100	90	95	90	95
Eadsos	80	80	90	75	75	75	100	75	100	75	70	60	75	80	80	100	90	95	90	95
Squatchie	85	85	75	50	50	50	100	85	85	50	75	50	50	75	75	75	75	75	75	75
Marion	85	85	75	50	50	50	100	85	85	50	75	50	50	75	75	75	75	75	75	70

D

Central Section of Middle Tennessee.

E

Eastern Section of Middle Tennessee.

F

Cumberland Plateau.

JUNE CROP REPORT FOR 1914—T. F. PECK, Commissioner of Agriculture

DISTRICT	COUNTY.	Cotton—acreage.	Cotton—condition.	Wheat—yield, per cent.	Garden—condition.	Oats—yield, per cent.	Young Clover—condition.	Grasses—condition.	Millet—acreage.	Corn—acreage.	Corn—condition.	Tobacco—acreage.	Tobacco—condition.	Apples—condition.	Peaches—condition.	Grapes—condition.	Stock Peas—acreage.	Irish Potatoes—acreage.	Irish Potatoes—condition.	Sweet Potatoes—acreage.	Tomatoes—acreage.	Tomatoes—condition.	Peanuts—acreage.	Peanuts—condition.	Live Stock—condition.	Alfalfa—condition.	
G	Claiborne	..	..	55	60	50	50	60	..	100	75	..	..	60	25	50	..	75	..	40	40	65	50	..	..	60	..
	Hancock	..	..	90	75	50	50	50	..	90	75	..	..	70	80	80	..	80	..	70	90	90	80	..	90	..	
	Anderson	..	..	80	80	85	85	75	100	100	75	..	..	90	90	95	..	100	100	85	100	75	70	..	80	..	
	Granger	..	..	95	80	80	90	85	95	85	..	..	..	85	75	90	..	50	..	..	..	90	..	..	..	..	
	Union	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Knox	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Rhea	..	..	75	40	..	50	40	..	..	80	..	..	..	50	40	50	..	80	..	75	80	50	..	..	85	..
	Roane	..	..	66	40	..	40	30	..	100	90	..	..	..	75	85	..	65	100	75	80	..	50	..	85	75	
	Loudon	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	McMinn	..	..	75	90	80	75	70	50	35	80	..	..	..	85	85	90	90	70	95	80	..	..	..	..	75	..
	Meigs	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Bradley	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hamilton	..	..	100	90	80	80	75	80	75	100	95	..	..	90	100	95	100	75	85	60	..	..	..	..	100	..	
James	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Johnson	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Sullivan	..	..	80	80	75	80	80	80	80	100	80	..	..	75	50	100	80	100	100	100	100	90	..	..	80	80	
Carter	..	..	100	100	100	100	100	100	100	100	100	..	..	90	100	100	80	100	100	100	100	90	..	..	80	80	
Hawkins	..	..	100	100	100	100	100	100	100	100	100	..	..	90	100	100	75	100	100	100	100	90	..	..	80	80	
Washington	..	..	100	100	100	100	100	100	100	100	100	..	..	50	80	80	75	100	100	60	75	100	50	..	..	80	..
Unicoi	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Greene	..	..	85	90	60	50	50	50	75	90	90	..	..	60	50	90	65	50	50	80	90	85	..	..	85	80	
Hamblen	..	..	15	25	15	80	75	90	100	90	90	..	..	50	100	100	80	100	100	80	80	85	..	..	80	80	
Jefferson	..	..	100	75	70	85	65	65	100	90	90	..	..	50	40	85	85	100	100	65	85	80	..	..	95	95	
Cooke	..	..	80	60	40	70	40	100	100	70	70	..	..	90	90	90	80	80	80	80	80	90	..	..	70	85	
Sevier	..	..	85	80	85	75	70	70	85	95	100	..	..	75	85	85	80	80	80	80	90	90	..	..	95	95	
Blount	..	..	85	95	50	60	70	70	95	100	100	..	..	50	65	100	100	100	100	40	100	100	..	..	95	95	
Monroe	..	..	75	90	75	80	70	40	75	80	80	..	..	75	80	80	60	60	40	30	..	60	..	..	75	75	
Polk	..	..	95	77	88	67	65	63	70	89	82	65	65	74	67	81	76	84	84	64	80	81	75	72	77	88	79

Mountain Section  
of East Tennessee.

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