

Morning Session, Thursday, January 1, 1920, 10.15 a. m.

PRESIDENT W. C. O'KANE: The chair desires to wish all of you a Very Happy New Year.

The first paper on the program is "The Work of the Railroad Entomologist," by V. I. Safro.

THE WORK OF THE RAILROAD ENTOMOLOGIST

By V. I. SAFRO, *Louisville, Ky.*

With the development of railroad agricultural departments, the need for railroad entomologists is coming more and more into evidence and it will be but a matter of a few years before every large railroad will have its entomological officials. There is a definite field in the agricultural and commercial activities of a large railroad which would come naturally under the jurisdiction of the entomologist—work which now is either entirely neglected or to a great extent imperfectly conducted. The intent of this article is to indicate to prospective railroad entomologists the lines of work that should come under their attention, and, incidentally, to crystallize for railroad agriculturists the duties that definitely necessitate the employment of entomologists.

The writer has based his discussion upon considerable work done for and with railroads, upon some five years of frequent contact with railroad entomologists, horticulturists, agriculturists, and their problems, and upon many excellent opportunities to observe the need of such work as is here indicated.

The occurrence and solution of certain entomological problems has been noticed from time to time in its most evident form; namely, the reduction of tonnage due to insect damage to crops. And whereas this is by no means the only line of endeavor for the railroad entomologist, it is the one line that the average railroad official can understand without the exhaustive explanation that may be necessary to justify the appointment of an entomologist for the solution of other entomological problems affecting railroad economics.

In instances that have come before the writer, the solution of any one of many of these common tonnage problems would of itself have paid the salary of the entomologist several times over and given a handsome profit to the railroad, and this is what the railroad official in authority will most easily understand.

POSSIBILITIES OF INCREASED TONNAGE

The writer has at hand a letter received some time ago from J. A. Hughes, horticulturist, American Refrigerator Transit Co., Missouri Pacific Railroad. He states:

"We are prepared to move about 3,000 cars of onions from southern Texas, and the Laredo district is suffering from one of the worst infestations of thrips I have ever seen. . . . We estimate the tonnage reduced fully 20 per cent on account of this pest."

It had previously been demonstrated in this same district that the ravages of the onion thrips could be materially checked by proper control methods; and, accepting Mr. Hughes's estimate of 20 per cent reduction in tonnage due to the onion thrips, the work of an entomologist for about two months in the Laredo district might have been conducive to a greater tonnage with a maximum possibility of increase amounting to 750 cars.

E. G. Kelly writes in the *JOURNAL OF ECONOMIC ENTOMOLOGY*, April, 1917, p. 233, that the "green bug" in 1916 destroyed 250,000 acres of oats and 100,000 acres of wheat in Kansas alone, mostly in only four counties. In Oklahoma, the destruction was estimated at 350,000 acres of oats and 160,000 acres of wheat. Mr. Kelly informed the writer at the time that a good part of this infestation could have been prevented by proper entomological procedure.

Proper entomological work at that time would not only have paid the railroad a profit amounting to many times the expenditure of the entomological service but would have increased the wealth of the population along the railroad and because of this would have materially contributed to the good will—an asset which the railroads recognize as being of exceeding importance.

The destruction of potatoes by the Colorado potato beetle is one of the very common examples. Within the last several years destruction of crops by the potato aphid has become evident, so much so that several railroads have endeavored to interest themselves to the extent of seeking relief for the growers of their respective districts.

The University of California, as a result of work on the peach worm at Newcastle, Cal., produced in one year an increase of 500 cars of peaches, as reported by the local railroad officials. After eight years of work at Watsonville, Cal., the tonnage of apples was increased to the amount of over 800 cars. Upon the completion of mosquito extermination work at Bakersville, Cal., land values increased 200 per cent.

The past season at Midland, Tex., arrangements were made to take care of the crop of honey dew melons. One hundred refrigerator cars, and sufficient ice accordingly, were reserved for the purpose. An epidemic of aphid occurred, found the growers unprepared and unequipped to meet it, with the result that the tonnage was reduced to only four cars. Here was a loss of tonnage, a loss of ice, ninety-six cars tied up when refrigerator cars were in demand elsewhere, a loss of revenue to the railroad and the refrigerator company of \$150 per car.

The writer's definite results in increasing cantaloupe tonnage in southern California through control of severe aphid epidemics, leads him to state that practically all this tonnage could have been saved—an item amounting in transportation charges alone to about \$14,400, to say nothing of loss to the growers in the section; and, in consequence, their lower purchasing powers and smaller shipments of purchases into the district.

These few random examples give a definite glimpse of possibilities.

Epidemics of grasshoppers, Colorado potato beetles, chinch bugs, etc., are too well known to merit further discussion here.

The cry of the roads is for tonnage, tonnage and more tonnage. Give them tonnage and they can use you whether you call yourself a freight solicitor or an entomologist.

ENTOMOLOGICAL ASSISTANCE AND CROP DIVERSIFICATION

Crop diversification is an important item in railroad economics. The greater the diversification—within, of course, reasonable limits—the greater the economy effected in the distribution of rolling stock, labor and risks. A section devoted entirely to one crop may cause a railroad enormous loss by the failure of that crop. Diversification would tend to minimize the possibilities of total crop failures. Single crop districts give rise to freight congestions, shortages of cars, and embargoes—all of which problems can be minimized by proper diversification.

In many instances observed by the writer, the limiting factor preventing diversification has been an insect factor susceptible to satisfactory solution.

Several instances have come to the writer's attention in which some crops are grown only on a household scale which should be grown commercially in the same district. Such is often the case with cabbages, onions, melons and other truck crops. Entomological work in such instances may result in practically building up communities.

Often it occurs that crops, once established, are later abandoned because of insect pests.

Doctor E. D. Ball, in a letter to the writer dated April 16, 1917, stated that:

“‘Sugar beet blight,’ caused by the puncture of the beet leaf-hopper, has been a very largely contributing cause of the abandonment of sugar beet raising in a number of western areas. Several factories have been dismantled and others are lying idle at the present time on this account, involving losses running into the millions of dollars in each case. These losses, while not entirely preventable in most cases, were sufficiently so to have maintained the industry if entomological assistance had been used.”

He also states:

“The sugar beet seed production was abandoned in the Arkansas Valley and other

districts of the Plains region on account of injury by the false chinch bug, an injury which might have been controlled by entomological assistance."

Doctor F. H. Chittenden, in a letter to the writer April 14, 1917, stated:

"The raising of seed beets has been practically abandoned in the east on account of the ravages in past times of the beet aphid."

The Imperial Valley, California, at one time had a distinct cabbage shipping season. Primarily because of the cabbage aphid and the lack of information among the growers on proper methods of control, the growing of cabbage on a large scale was at one time practically abandoned and even to the present time the production of Imperial Valley cabbages is much smaller than it would be under proper stimulation.

COÖPERATION BETWEEN RAILROAD AND GROWER AND OTHER AGENCIES

The railroads recognize this item as being of considerable, often in fact of paramount, importance. Practically all railroads endeavor in some form, often very crudely and ineffectively, to foster such coöperation. Railroads have reprinted official bulletins or issued publications of their own, intended to disseminate the proper information not only to growers themselves but to business men, local banks, etc.

Railroad demonstration trains are of common occurrence and as this phase of agricultural activity becomes better known, the entomological work incident to such trains and railroad schools will become quite evident.

One example of this type of service will suffice: At one time the M. K. and T. Railroad sent out a notice to orchardists along its lines stating:

"Starting November 8 and running to December 3, we are coöperating with horticultural officials and authorities in this state, also with the U. S. D. A. in conducting an orchard clean-up campaign along our lines in Texas. . . . Our working force of practical scientific men will go into the field to prune, spray, dehorn and teach the care of orchards with all its relationship to the proper setting of fruit to all communities who desire this work."

ENTOMOLOGICAL QUARANTINE AND INSPECTION

This problem is becoming increasingly prominent, and frequently arises to bother the railroad as well as the shipper. Most disagreements occur entirely as a result of lack of understanding of the true situation.

The railroad entomologist would have jurisdiction over inspection of cars for the gypsy and brown-tail moths, keeping cars used for ship-

ment of sugar cane free of scraps as a measure against the sugar cane moth borer, observance of pink bollworm precautions, interpretation and execution of entomological quarantine regulations generally, and the promulgation of such railroad regulations as will enable the road to properly observe the quarantine orders of the various states with least loss and friction.

THE ENTOMOLOGIST A BUILDER OF GOOD WILL

Good will is recognized by business as a distinct and often a prime asset. It is a commodity that is capitalized, purchased, sold, leased. And here the entomologist can function as a most important factor. He can keep in touch with growers, individuals as well as organizations, and dealers to their ultimate benefit and protection. He can issue timely warnings of possible or threatened epidemics; he can assist growers to obtain proper material or outfits for their control work; he can warn against fraudulent materials or irresponsible concerns; he can press the passage of proper laws to protect the grower; he can urge enforcement of laws, otherwise permitted to lie dormant; he can function as coöperator with county agents, state and government officials; he can conduct demonstrations, schools and even correspondence courses; he can assist local health authorities along the line of elimination of flies, mosquitoes, etc., thereby being conducive to better living conditions, increased colonization, higher real estate values and greater prosperity and happiness generally.

PRESIDENT W. C. O'KANE: The paper is before you for discussion.

MR. LEONARD HASEMAN: I would like to know if any entomologist at present represents a railroad.

MR. V. I. SAFRO: Before the war, I knew personally about eight or ten who devoted their entire time to such problems. There were in addition to these, two or three dozen who were primarily engaged in other work, but spent part of their time on entomological problems. The return of the railroads to their private owners will be an incentive to the railroad agriculturists to begin to organize their departments along solid definite lines.

SECRETARY A. F. BURGESS: It seems to me that this paper is timely and has pointed out a field of activity that a good many of us have never considered. I can see where there might be some opportunities along this line that would be beneficial not only to the railroads and their shippers but to the entomologists as well.

MR. C. L. MARLATT: One important point that the paper brought out which I want to emphasize with a word or two is the necessity for the inspection and clean-up of freight cars at the point of des-

tionation. You recall, perhaps, the reports that have been published in our monthly Service and Regulatory Announcements of the findings in freight cars. You remember, perhaps, the items in relation to carriage of the potato beetle and also refuse Florida oranges and vegetables from Chicago to California. As a result of those findings, the Secretary of Agriculture addressed a letter to the railroad administration asking if measures could not be enforced to compel the cleaning of freight cars at the point of discharge of the contents, in order to prevent the carrying of pests. I think that is something that should be followed up.

PRESIDENT W. C. O'KANE: We will now listen to Mr. Pierce's paper on "Commercial and Professional Entomology—The Future of Our Profession."

COMMERCIAL AND PROFESSIONAL ENTOMOLOGY—THE FUTURE OF OUR PROFESSION

By W. DWIGHT PIERCE, *Consulting Entomologist, The Gage-Pierce Research Laboratories, Incorporated, Denver, Colo.*

We have for so many years looked upon entomology as either a pastime of men engaged in other occupations, or as a salaried federal, state or institutional profession, that we are apt to forget another very important branch of the science. In fact the rolls of our society have contained but few names of men who could not be classified under one of these heads. But this year it is different, and in coming years, the time is not far distant when the commercial and professional entomologists will outnumber their fellows.

For at least ten years there has been a strong undercurrent of discussion among the younger men in our science looking forward to the time when entomology would be unshackled and able to raise its head among the professional sciences. Many of us have realized the absolute impossibility of great progress in entomology until we could have at least as large a body of men unhampered by institutional or legislative restrictions, as there were under those conditions. We saw that when that happy day arrived the average pay in our profession would naturally be greater, because when a man has a chance to be a free agent he can bargain better for his salary. I recognize the fact that what I will say may open an entirely new line of thought to some of you and that some will not like to hear it. But I believe the majority will rejoice with me that the day is now at hand when entomology steps forth into new fields to make a new name for itself, as one of the great economic professions of the new world era.

I do not know positively how many men are already in the practical