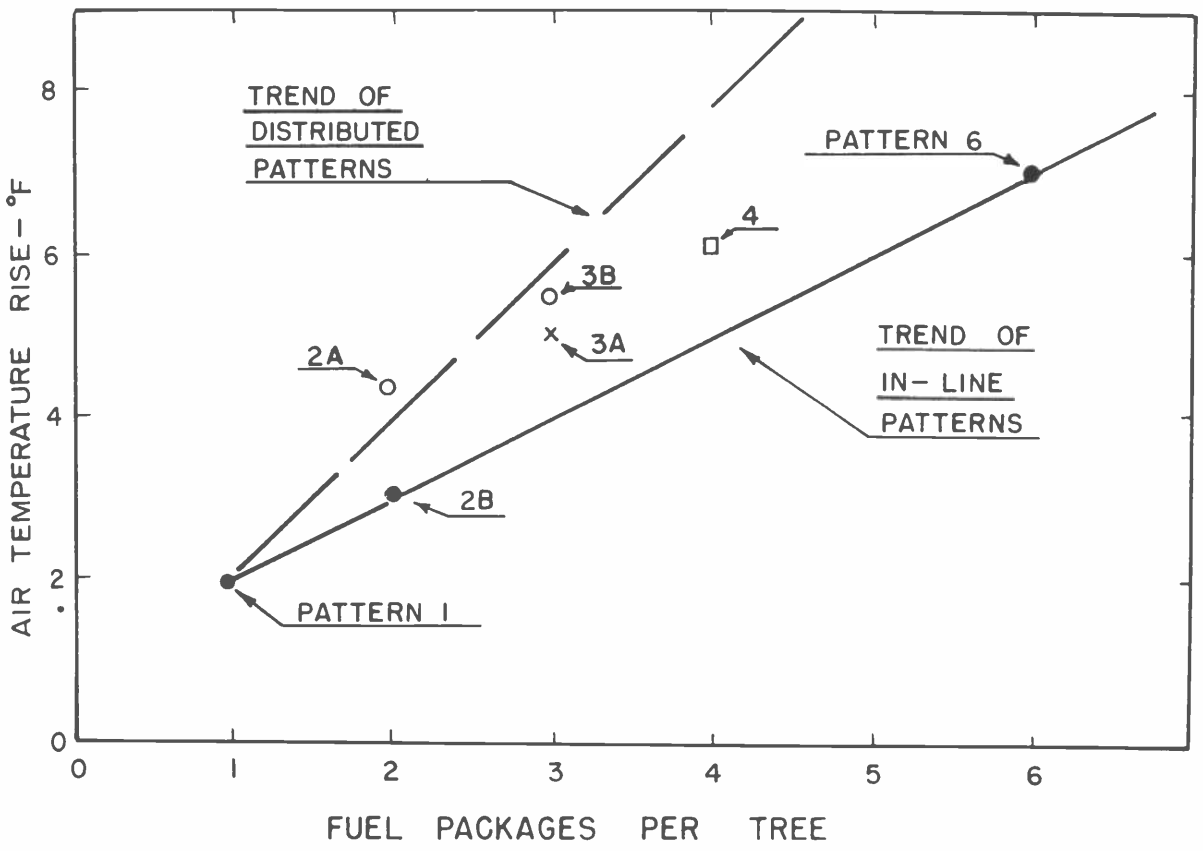

FIGURE 5 — Temperature rise above unheated areas achieved by various amounts and placements of petroluem coke grove heaters during 1965-66 tests.

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and diesel fuel are very effective. The upper surface of the solid fuel package can be quickly covered with the burning liquid fuel to achieve good ignition. Igniting the solid-fuel packages required 0.2 to 0.5 man-hour per 100 trees. The lower figure is for one package per tree, and the labor is increased for distributed patterns compared to in-line patterns. The 0.5 man-hour per 100 trees applies to six packages per tree in a distributed pattern. Placement under trees having low canopies required two to three times the lighting labor of between-tree patterns.

Typically one might achieve a six degree temperature rise for four hours using three 4-pound packages of petroleum coke fuel per tree, uniformly distributed in the grove, with a total expenditure of labor for handling and lighting the fuel of 1.9 man hours per 100 trees.

Conclusions:

Solid fuel petroleum coke grove heating products in 4-pound packages may be effectively used in grove heating with expectation of the following inputs of labor and heating results.

1. **Labor for loading and placing in grove in practical patterns will range from 0.6 man-hour per 100 trees for one package per tree to 1.7 man-hours per 100 trees for six packages per tree. Labor for opening and disposing of cartons will be an additional 0.8 man-hour per 100 cartons.**
2. **Lighting will require 15 minutes per 100 trees for one package per tree to 30 minutes per 100 trees for six packages per tree placed in groups of two around the trees.**
3. **Average air temperature rise at the 5-foot level in groves may be expected to be 1½ to 2° F. per package per tree with the high figure applying to the lower numbers of packages per tree and the most uniform distribution patterns. Two degrees per tree may be expected at one package per tree. Nine degrees per tree may be expected if six packages per tree are distributed about trees in groups of two.**

TURKEY

For Thanksgiving and Christmas

By C. D. Busch

(A staff member reports on his travels from last Nov. 15 through Jan. 15, which were devoted to evaluating a Turkish irrigation project.)

The Turks tell many stories relating the outlook of a village teacher known for centuries as the "Hodja." One such story concerns a gathering where the people were discussing the merits of youth and old age. They all agreed that a man's strength decreases as the years go by.

The Hodja dissented: "I don't agree with you gentlemen," he said. "In my old age I have the same strength as I had in the prime of my youth."

"How do you mean, Hodja, sir?" asked somebody. "Explain yourself."

"In my courtyard," explained the Hodja, "There is a massive stone. In my youth I used to try to move it. I never succeeded. Neither can I move it now."

In a somewhat similar spirit we eight irrigation development evaluators (four Israelis and four Americans) were asked to suggest ways of moving the large obstacles to completion of the farm irrigation development for 130,000 acres. Youth was exemplified in the five year construction period; age, in the practices born of centuries of non-mechanized experience and tradition.

Plenty of Water

The Seyhan Irrigation Project, fed by the Seyhan River water, is designed to irrigate an area of 425,000 acres in the Adana Plain (see accompanying map). The river, with much of its watershed high in the Taurus Mountains, has ample water for irrigating the entire area. Winter rainfall, averaging about 30 inches, has provided enough moisture for winter grains, for dryland cotton, and for a considerable drainage problem. However, the long, hot, dry summers make irrigation necessary to permit citrus, double cropping, and increased yields from winter crops.

Water for irrigation is available from the district's main canals. To enable utilization of the water on the farmer's land, irrigation ditches, land leveling, and tile drainage are needed. This, of course, necessitates financing, with credit from the Agricultural Bank, an institution that proved to be notoriously wrapped in red tape, and tied to severe collateral requirements.

Slow and Difficult

Over the past two years, only 21 farmers had been approved for credit. The average time to arrange an improvement loan had been seven months. A man's credit approval for land levelling might be near completion, when his need to borrow for seed or fertilizer would ruin his credit rating — and thereby scuttle his plans for land improvement.

Operation of the irrigation system's

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main canals has done little to encourage the local farmer to plan better farm water management. The system, in fact, was turned on in the spring and turned off sometime before harvest. The ditchriders, responsible for approximately 20,000 acres per man, lacked any sort of four wheeled transportation.

In addition, the system is totally without provision for measuring water at the farm turnouts. Additional evidence of operational problems came from the office collecting water dues. The previous year's record showed an equivalent of $320,000 owed to the district by all farmers. However, only $120,000 had been collected. For the same year, operation costs totalled $180,000.

No Proper Provisions

In planning for the land leveling and farm ditch construction, an order for close to a million and a half dollars worth of machinery was placed. Presumably, operations would start during the following spring, about four months away. However, not a single spare part had been ordered, nor were any known to be available in the country. Neither were the projected mobile repair shops expected to be available at the start of the land leveling operations. Finally, there was no training program to provide the people needed to operate the new equipment, or to man the repair shops.

After we had gained some understanding of the problems of finance, equipment and operations, the problems of field size and farm fragmentation still remained. The average field size was 6½ acres. A farmer's two or three fields were most often separated, and irregular in shape. Even if the farmer and the bank were in favor of land leveling, and the equipment and operator were available, it would have been impossible to do an efficient job on the small, scattered fields.

Suggestions for Improvement

On the four problems cited, and on a number of other issues, the evaluation team wrote suggestions in a report totalling 140 pages. In financing we proposed that the government bear the cost of land leveling. For operation of the system, we proposed formation of an entirely new organization, complete with an advisory team to help it get started. The same was suggested for the operation and maintenance of land leveling machinery.

Finally, the problem of small field size was sidestepped by a proposal to level the area in blocks of fields, the smallest being 60 acres.

These specific proposals were supplemented by further proposals for expanded agricultural extension to help the program along, and for working committees to facilitate cooperation between the farmers and the government.

Hope For the Future

The number and severity of the problems besetting the development of the Seyhan Project might lead the reader to despair of progress in Turkey. It is not true, of course, that the evaluation team discovered these problems, while the Turks had been blindly muddling along unaware of their existence.

The problems, and most of the solutions, were worked out through intensive cooperation with Turkish authorities. The advantage which rested with our team was that of a non-partisan approach to local agency rivalries, and authority to look at the whole scene. This led to acceptance and adoption of some of the team's suggestions before the report was formally published.

We left Turkey with great hopes that the youthful development project would indeed have the strength not found in the older practices, strength to move the obstacles blocking better utilization of the fertile Seyhan region.

The author is a member of the Department of Agricultural Engineering.

QUINIENTOS POLLOS requieren aproximadamente, 250 kg. de alimento durante las primeras diez semanas de vida. Para las diez semanas siguientes los pollos consumirán unos 1,450 kg. Esto indica que se necesita de once a trece kilos de alimento para criar una polla hasta su madurez.