Picture No. 1 (at left) — Field of cantaloupes in the Salt River Valley ruined with bacterial blight and subsequent sunburn of fruits exposed by killing of the foliage.

Picture No. 2 (below) — Bacterial blight of cantaloupe, Salt River Valley. (a) Bacterial spot started near middle of leaf. (b) Bacterial infection working from leaf margin, followed with inward rolling of margin, death and drying out. (c) Lower part of leaf-stem (petiole) spotted and water-soaked and upper part drying and constricting.

Plant Cantaloupe Seed That's Been *Disinfected*

By J. G. Brown
and Maryhelen Simonsen

The advice expressed in the title of this note is suggested by the blight of cantaloupes that visited the Salt River Valley last season. The blight destroyed some fields (Picture No. 1) and other fields were variously affected. The aggregate loss in cantaloupes and honeydew melons was considerable. The bacterial parasite that did all this appears to have "hitch-hiked" into the fields on the seed that was planted (Picture No. 3).

The bacterium killed the first leaves, an expected result with several seed-borne plant parasites. There followed a period during which new leaves came out that also later became infected. Finally, a few fields showed so much of the foliage killed and dried that they rustled like the dried stalks in a corn field.

The bacterial infection on a leaf might start either on the margin or anywhere on the blade (Picture No. 2a). From the margin, the water-soaked, infected area extended inward, usually in a wedge-shaped manner (Picture No. 2-b). The infected part soon turned brown, dried, and often curled upward. From the blade, the infection moved down the leaf stem (Picture No. 2-c), which became water-soaked first and later dried and more or less twisted, to the vine. The dried leaf stems were browned and tough and remained attached to the sick vine. Killing of the leaves by the bacterium exposed the fruit to sunburn (Picture No. 1).

Bacterial spread appeared to be hastened by insects. Evidence of this were blighted flowers and small fruits, and the decay of larger fruits. Besides, leaf-miner tunnels were sometimes darkened instead of showing the usual light-colored margins.

From the larvae of the leaf miners, bacteria were cultured that were like those isolated from the dead and dying leaves. The blighted flowers could

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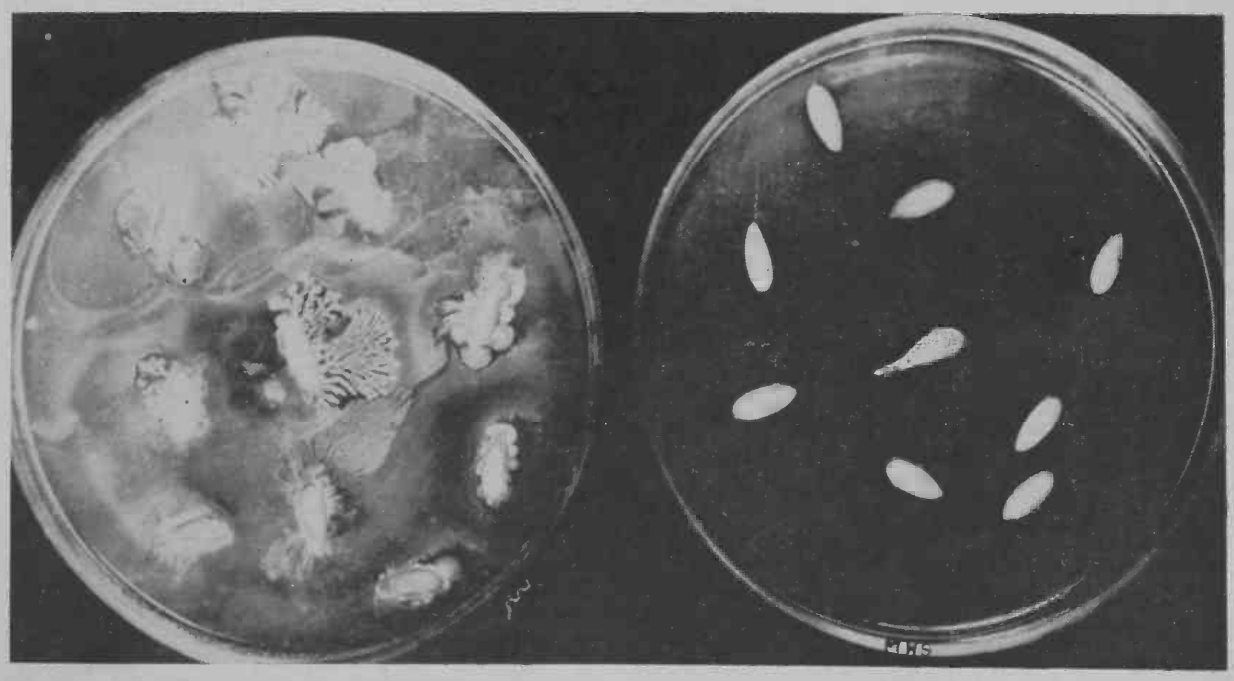

Picture No. 3 (at right) — Bacteria of cantaloupe blight are so far found only on the surface of the seeds, not inside. Shown are seeds left over from last season's planting in the Salt River Valley, cultured on steamed jelly. Seeds at left untreated show bacterial growth; those at right immersed in 1 to 1,000 solution of mercuric chloride for 2 minutes show no growth.

Plant Cantaloupe Seed That's Been Disinfected

(Continued from Page 3)

easily have been infected by bees and other flying insects while the miners helped to infect the leaves.

Leaf-miner larvae got all the blame for the blight, for they could be seen while bacteria could not. Leaf miners have been present in varying numbers in the Valley for no one knows how long without being accused of starting an epidemic on any crop until this blight came along. Furthermore, the majority of their tunnels in cantaloupe leaves last season were clean. However, if the bacterium of blight had not been brought in on seeds, neither leaf miners nor any other agency could have spread the blight.

That brings us to the matter of seed treatment as a means of heading off parasites that are "hitch-hiking" on the seeds. Cantaloupe seed planted last season often was said to have been treated with disinfectants. In all cases reported to us dusts had been used. These dusts evidently were used without regard to the special purpose of eliminating bacteria. Five or six different kinds of dusts were mentioned.

Much of the treated seed supplied us had poor coverage, up to 25 percent or more of the surface being free from microscopically visible coating. The cantaloupe seed is somewhat "slick;" doubtless a wet treatment would result in a better job of disinfecting.

Follow Directions

Several mercurials used in surface-disinfecting seeds are offered in both dust and water-soluble forms so that they may be applied in either dry or wet treatment. In preparing seed treatments the directions accompanying the disinfectant should be carefully followed.

Most plant pathologists still use the old, reliable, mercuric chloride solution in surface disinfecting seeds. The use of it requires care. Some kinds of seeds are more sensitive to it than other kinds and cannot be left in it too long. Furthermore, it can be used only in non-metal containers. We have had no visible injury to cantaloupe seeds that were treated for 2 minutes in a solution of one part mercuric chloride to 1,000 parts water.

The co-operation of both cantaloupe growers and seedsmen has been unstinted and is appreciated. Individuals of both groups have willingly sent to us samples of seeds upon request. Of course, the best seed and the best possible seedbed are primary requisites for profitable growing of crops; with the co-operation of growers, seedsmen, county agricultural agents and investigators much can be done to avoid a repetition of losses incident to the ravages of plant diseases.

— J. G. Brown is head of the Department of Plant Pathology. Maryhelen Simonsen is a graduate student in Plant Pathology.

Hear! Hear!

Hear these agricultural information radio programs. All times are Mountain Standard Time.

MONDAY THROUGH FRIDAY
- 11:45 a.m.—State Weather Forecast—KOY, Phoenix.
- 1:00 p.m.—Dinnerbell Time—KOY, Phoenix; KTUC, Tucson; KSUN, Bisbee-Douglas.

SUNDAYS
- 9:05 a.m. — Farm Demonstration Garden—KOY, Phoenix.

MONDAYS
- 12:45 p.m. — Extension Program—KAWT, Douglas.

WEDNESDAYS
- 7:15 a.m.—Extension Program — KYUM, Yuma.

FRIDAYS
- 12:45 p.m.—Farm & Ranch Program—KAWT, Douglas.

SATURDAYS
- 7:00 a.m.—Farm Service — KOY, Phoenix.
- 11:00 a.m.—Farm News — KOPO, Tucson.
- 12:30 p.m.—Stepping Along With the Extension Service—KGLU, Safford.
- 2:45 p.m.—Pima County Agriculture—KTUC, Tucson.

Agricultural Education

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gin as theories, which when proved by sufficient tests are ready for "practical" application.

More post-graduate students in agriculture are now enrolled than ever before. Seven departments with graduate students have a total of 23 taking advanced training. These graduate students are using for research study problems of importance to the industry. Most of these 23 separate problems could not receive immediate attention from the regular Experiment Station staff. Graduate work truly serves the dual role of supplying training for the students and research information of untold value to the agricultural industry.

The college-trained farmer of today, as well as the agricultural specialist, is getting a well-rounded education. Both are thus able to make their greatest possible contribution to the agriculture of the state and nation.

— Ralph S. Hawkins is Vice-Dean of the College of Agriculture.

Vegetables Are High in Essential Amino Acids

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teria were used in the analyses. Bacteria, like animals, require vitamins and amino acids if they are to grow and multiply. Because of this, they can be used in the determination of all 10 of the essential amino acids. These bacteriological methods are much more rapid, accurate and economical to use than are methods which require animals.

Cauliflower was found to contain 23 to 26 percent protein on the dry basis. As compared to whole egg protein, which is very well balanced in the 10 essential amino acids, cauliflower protein is well balanced. It is definitely optimal in methionine, valine, threonine, histidine, tryptophan and possibly arginine and phenyalanine.

Sweet corn contained 14 to 19 percent protein. This protein was not as well balanced as the cauliflower protein but was optimal in histidine, leucine, phenylalanine and valine. Broccoli contained 25 to 34 percent protein, which was optimal only in arginine and methionine.

Carrots contained 5 to 7 percent of protein, which was deficient in all 10 of the essential amino acids. Not any of these vegetables contained protein that was optimal in either isoleucine or lysine.

The results of this work must not be misinterpreted and lead us to think that cauliflower is much superior to carrots or broccoli as a food. Both broccoli and carrots contain large amounts of vitamin A, which is almost entirely lacking in cauliflower and very low in sweet corn.

The simple purpose of the work is to better enable us to balance diets from all standpoints. The more we know about the constituents of foods, the better we are able to determine their place in the diet.

— A. R. Kemmerer is head of the Department of Nutrition.

See Your County Agent

For additional information and help with your own problems of farming or homemaking, get in touch with your local County Agricultural Agent or Home Demonstration Agent. Extension Service county offices are usually located in the county-seat town.