SOME INDICATIONS OF A RELATION OF SOIL FERTILITY
AND PLANT NUTRITION TO CANE DISEASES
IN HAWAII

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The history of the sugar industry in Hawaii shows an increasing
tendency toward susceptibility of cane to disease. The three diseases
causing the greatest losses are probably growth failure or Lahaina
disease, eye spot, and brown stripe. There are other diseases, but
these have received the greatest attention, not only from the pathol-
gists, but from the chemists and agriculturists as well. There has been
not only an increasing susceptibility to these diseases, but also an
increasing severity of them.

In the early years of the sugar industry in Hawaii, Lahaina was the
cane variety grown almost exclusively. At that time, little fertilizer
was used, and this, as a rule, was low in nitrogen. Areas of poor
cane developed, and in time much of the Lahaina was making poor
growth. In a short time the Lahaina failed almost entirely and was
displaced by Yellow Caledonia and H 109. But with the changes in
variety, growth failure did not entirely disappear, and at the present
time appears to be increasing in severity.

Recent investigations (3) show this disease to be associated with a
root-rot and the organism Pythium aphanidermatum. It has been
called Pythium root-rot of cane, but in this paper the term growth
failure will be used. Whether the Pythium is the direct cause of the
disease or whether it is secondary as the result of a weakened physi-
ological condition, due to a plant nutrient deficiency or an unbalanced
nutrition, is an open question. Some doubt that the severity of
growth failure is on the increase, but many who are in daily contact
with field conditions believe that it is not only becoming more severe,
but that it is spreading and beginning to affect varieties which have
hitherto been considered resistant to this disease.

Eye spot and brown stripe are both Helminthosporium diseases.
The former is caused by H. sacchari (5), and the latter by H. steno-
spilum (2, 5). Both are disseminated by spores and are characterized
by small lesions on the leaves. The injury caused by these two dis-
eases appears to result largely from a reduction of the active leaf
surfaces. This may be due to the death of the tissue within the lesion
itself or to a secondary effect of the organisms on the tissue out-
side of the lesion, and the extent of the injury seems to be in almost
direct proportion to the extent of leaf surface affected.

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2Numbers in parenthesis refer to "Literature Cited", p. 389.