crop production has fallen, do growers call in a plant disease
diagnostician. Applications of chelated minor elements are the
quickest and easiest way to de-
termine just what ails the plant
if symptoms indicate a nutrient
shortage.

In states west of the Rocky
Mountains, iron deficiency is
severe or pronounced. Slight to
moderate and sometimes severe
deficiencies of zinc are found in
Hawaii. There are only a few
areas where plants show signs
of manganese deficiency; pahala
blight of sugar cane on the island
of Hawaii is an example. Con-
versely, it is said that most areas
have too much manganese and a
toxic manganese condition ex-
ists. Here again, chelates may
correct the situation. Because of
a copper deficiency in Florida,
growers continue to spray citrus
trees with copper until they cre-
ate a toxic condition with symp-
toms similar to iron deficiency.
Iron chelate applications correct
this condition by offsetting the
excess copper rather than fulfill-
ing an iron shortage. In the
Pacific Northwest, after years of
spraying with lead arsenate for
coring moth control, soils be-
came so saturated with arsenic
that young peach trees failed to
grow. Dr. Nels Benson, Wen-
atchee Experiment Station,
found that a soil application of
zinc chelate would offset this
toxic condition and allow the
young peach trees to grow nor-
mally.

Manganese chelate, as a foliage
spray on manganese deficient
Yellow Newton apple trees in the
Watsonville area of Cali-
foria, gives only partial correc-
tion. Zinc chelate has very little
effect when applied alone on
these trees, but the combination
of both manganese and zinc che-
lates does an excellent job. Dr.
K. Uriu, University of California,
Davis, found that the soil condi-
tions causing these deficiencies
have not been changed; growers
must apply manganese and zinc
chelate sprays every year if trees
of good color and production are
to be maintained.

Severely sick almond and ap-
ple trees grow in Zee Canyon
near San Luis Obispo, Calif. Tests
with the various chelates re-
vealed that a severe copper de-
ficiency was the cause. Copper
deficient plants may start new
growth in the spring but soon
run out of steam; the terminals
die, and leaf tips and edges pro-
gressively burn and die back.

These same symptoms were
noted on lychee and macadamia
nut trees growing in the Knud-
sen Gap area of Kauai, Hawaii.
Various chelates were tested on
these sick trees. These tests have
shown that copper chelate, ap-
plicated as a foliage spray at 1/2 lb.
per 100 gals. of water with a good
wetting agent was sufficient to
help these trees return toward
normality and to set a nut crop.
The check trees are still sick.

Tree Drip Area Sprayed

In December, iron, zinc, man-
ganese, magnesium, and copper
chelates were applied separately
to young macadamia nut trees
on the Homolmalino Ranch, south
of Kona, Hawaii. These chelates
were applied to the soil at 1, 2,
and 4 ounces per tree and dis-
tributed over the drip area (un-
der the canopy) of each tree.
Preliminary data show that trees
treated with the copper chelate
are ahead of all others in ap-
pearance, color, and leaf size.

A severe twisting and deform-
ing condition of new branches is
fast becoming a serious problem
of the young macadamia nut
trees growing in this area. In-
dications are that copper chelate
prevents this condition. Further
tests are needed to verify these
findings.

Three years ago, sick, young
slash pine seedlings, at the Kam-
uela Tree Nursery on the big
island, Hawaii, were saved with
a foliage spray of copper chelate
at 1/4-teaspoon per gallon of
water.

Homeowners are usually un-
aware of sick plants in their yards.
If they do notice diseased plants,
their application of a general
fertilizer may not give the green
garden envisioned as normal for
their part of the country. With
this in mind, and using a bal-
anced combination of chelates,
concentrate solutions of trace
elements have been developed;
one is Geigy's "Greenzit." Tests
are now underway to verify the
early results of tests with this
material. Such concentrates can
be applied through a hose spray-
er for convenience or by a reg-
ular spray machine. They have
been applied to a wide variety
of ornamental plants, shrubs,
trees, and lawns. Tests were
established in the latter part of
July on golf greens at the Navy
Marine Golf Course. So far, only
one plant, the poinsettia, is found
sensitive to the spray solution.
However, new growth more than
makes up for slight "burning" of
the terminal leaves.

Response to a foliage spray has
been very rapid. New leaves and
blossoms appear within a week
after application. Dormant buds
are activated and make plants
bushier. Color of old, chlorotic
leaves is not changed to any
large extent, but new leaves
emerge larger and stronger with
a liquid luster. Combination che-
late sprays intensify any natural
color variation of the plant; the
reds become redder, the yellows
more yellow, and the green a
more luxuriant green. With the
help of these chelated minor or
trace elements, we are now able
to make plants greener and more
beautiful than ever before.

New Ornamental Developed

An extremely hardy, ever-
green, ornamental vine, adapted
to shady and partially shady
areas, has been developed by the
United States Department of
Agriculture, at the University of
Maryland agricultural experi-
ment station.

Particularly suited for use as
a ground cover and as a cover
for low masonry walls, the new
vine has been named Longwood.
A type of euonymus, the vine is
a vigorous grower with dark
leaves and light-colored veins.
Leaf dimension is one-half by
three-quarter inches, and is
readily propagated from cut-
tings.

The new ornamental has with-
stood temperatures from minus
25°F to 106°F. Grown in full
sun, at high temperatures it may
scald. Longwood has been dis-
tributed for commercial repro-
duction and will be available on
the retail market in 1967.

20  WEEDS TREES AND TURF, May, 1966