Useful Fertility

A 34-Year Study of A Wide Variety of Grasses Shows That There Should Be A Limit to the Peak of Quality

By HENRY C. MITCHELL
Supt., Old Oaks CC, Purchase, N.Y.

BACK IN the late twenties I read a book called "The A B C's of Turf Culture" which was written by O. J. Noer. The book corroborated many basic principles of turf culture which had already been drummed into my head by my father, an agronomist of the old school. Later I attended Professor Dickinson's school at the University of Massachusetts. He used the same principles to explain what he called the limits of tolerance of grass.

The depression, followed by the war, made it impossible for even the larger clubs to continue accepted standards of maintenance. The post-war era brought back prosperity as well as a flood of new chemicals, machines and new varieties of grass. In their efforts to be spectacular,
turfmen forgot that turf has a limit of
tolerance, not only to traffic but to fer-
tility as well.

Traffic and Treatments

I have been studying the results of
traffic and treatments on various turf
areas in an attempt to determine just
how far off the track we have wandered.
I have depicted in the graph on this page
my interpretation of observations made
over a period of 34 years. It shows the
peak of useful fertility under heavy traffic.
It is fairly accurate for most varieties and
species of turf grass grown in the sun in
all climates from Maine to Louisiana.
This is provided, of course, that the va-

Henry C. Mitchell's article does not nec-
essarily present the views and opinions of
GOLFDOM but is presented as a thought-
provoking treatment of the subject of fer-
tility.

riety is tolerant to temperature ranges and
the height of cut. (See graph.)

In the graph, fertility equals nitrogen
in lbs. per 1,000 sq. ft. per month (in-
cluding clippings, top dressing, etc.) plus
water figured in tenths of an inch per
day (including rainfall but excluding run-
off). Lack or excess of some other element
is, of course, often the cause of turf fail-
ure. The resistance factor is resistance to
disease, weeds, traffic and machines. The
recovery factor is speed of healing. The
figures used for these two factors, (resis-
tance and recovery) include weekly obser-
vations of the effects of traffic and disease
and yearly observations of change of popu-
lation of grass, weeds and poa annua. Al-
lowances are made for the areas of tees
and green and amount of traffic. The poa
annua line is based on results from 20,000
rounds per year where the area of greens
is 5,000 sq. ft., tees, 3,000 sq. ft. and on
well drained fairways where traffic is not
concentrated for any reason.

Extra traffic, poor drainage and shade
make fertility more harmful. Recovery
varies with the variety, the temperature
and the season of year. Fertilizer for in-
creased recovery is futile in hot weather.
Northern grasses like to recover in May
and June and September and October.
Some southern grasses are more resistant
to traffic but reach the peak of useful
fertility at the same time as northern grass.

Resistance plus recovery gives turf qual-
ity. It varies with species but is controlled
by fertility and follows the trend of the
graph regardless of variety.

Color also varies with different varie-
ties and should not be used as a yard-
stick for quality. Playing conditions often
are rated higher than turf quality. Turf
which requires extra expensive mainte-
nance is lower in quality than it appears.

The cost line shows the average cost
of total maintenance on courses where
the observations were made, (compared to
1957 cost in New York Metropolitan area).
However, many low budget clubs are often
guilty of over-fertilizing in some areas.

Cool weather reduces fertility and prob-
ability of disease. The reverse is true in
hot, muggy weather, making proper con-
tral of the fertility more important.

Acidity reduces fertility and often pro-
duces organic residue which helps resist
traffic. My father used to say, "Lime makes
rich fathers and poor sons". He liked to
leave some organic matter in the bank.
A pH reading of 5.5 is not necessarily
harmful. Chemical weed treatment is often
a failure if weeds are not somehow replaced
with good turf. The resulting large in-
crease in poa annua often improves playing
conditions but can hardly be called
improved turf quality.

We dream of varieties of grass that will
exist on low fertility. But what we need
are grasses that will withstand the lush
conditions found on most of our courses
today. When the peak of quality is reach-
ed with a given budget and set conditions,
an attempted improvement with extra
nitrogen and water can only lead to dis-
aster. We will bust our bugles if we don't
stop trying to blow a note that ain't in the
horn.

In conclusion, I find that the peak of
useful fertility is reached when available
nitrogen averages 1 lb. per month and
available water equals 1/10 inch per day.
If less of one is applied, more of the
other can be used without harm. Poa is
increased by prosperity as well as traf-

GOLFDOM