THE RESPONSE OF QUACK GRASS TO VARIATIONS IN
HEIGHT OF CUTTING AND RATES OF APPLICATION
OF NITROGEN1

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QUACK grass, *Agropyron repens* (L) Beauv., occupies large land
acreages in Michigan and other northern states and has become
a plant of considerable importance. The plant has a tenacious
rhizomatic habit of growth and is difficult to eradicate. Several
methods of quack grass control are practiced nearly all of which
involve the exhaustion of root reserves and removal of photosyn-
thetic tissue.

The following paper reports a study of defoliation of quack grass
cultures, some high and some low in nitrogen. These were defoliated
at various heights for a considerable period of time and the various
effects on roots and rhizomes and new top growth were observed.

REVIEW OF LITERATURE

A study of the literature (2, 3, 4, 5)3 reveals that root and rhizome develop-
ment and yield of grasses are influenced by the cutting treatment. In general, the
more frequent and complete the defoliation the less is the yield of roots, rhizomes,
and tops. Severe defoliation and application of nitrogen to grasses having abun-
dant reserves stimulates a vegetative response, the carbohydrate reserves are
rapidly consumed, and with slight opportunity for replenishment they often be-
come the principal factors limiting growth.

As pointed out by Dexter (1) it is difficult to exhaust the organic reserves
of quack grass or to place it in a condition where it is susceptible to injury by de-
foliation.

METHODS AND MATERIALS

On July 12, 1937, ten quack grass rhizome segments, 2 to 3 inches long, were
placed in each of 80 10-inch clay pots. The plants were grown in the greenhouse at
East Lansing, Michigan. Sand cultures were used throughout the experiment.
The plants were supplied with a three-salt nutrient solution designated as type
IR34.4 The nutrient solution was applied by the slop culture technic.

Growth of the plants was steady and at the end of two months the pots were
well filled with vigorous plants showing good rhizome development. On Septem-
ber 20, the nutrients were flushed out of 40 of the pots by repeated applications of
tap water, the water being allowed to drip through the pot before each succeeding
application. From this date to the conclusion of the experiment these plants
were grown in a nutrient solution containing no nitrogen. This was accomplished
by substituting calcium chloride for calcium nitrate in equal molar quantities.

1Contribution from the Section of Farm Crops, Michigan Agricultural Experi-
ment Station, East Lansing, Mich. Journal Article 338 (N.S.). Received for
publication November 7, 1938.
2Assistant in Crops and Research Associate, respectively.
3Figures in parenthesis refer to "Literature Cited", p. 76.
4LIVINGSTON, B. E. A plan for cooperative research on the salt requirements of
agricultural plants. Ed. 2. 1919.

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