mm. sieve and also indicates the small effect of using half-
hight sieves rather than full-height sieves.

In the comparison of the full-height and half-height 

nesses without the 0.1-mm. sieve, the slopes of the γ on x 
and the x on γ (not shown) regression lines are nearly 
equal to 1 and the constants are close to 0. Essentially 
there is no detectable difference between the two sieve 
arrangements. There is less variation in sample replicates 
when the 0.1-mm. sieve is omitted from the sieve nest 
arrangement than when the 0.1-mm sieve is included in 
the sieve nest. The use of the 0.1-mm sieve increases data 
variability as evidenced by the 95% confidence intervals. 
The variation within samples run on any one sieve nest 
arrangement is of the same order of magnitude as the var-
iation between two sieve nest arrangements. Except for the 
full-height and half-height nests without the 0.1-mm. 
screens, the size of the confidence interval precludes con-
version of mean weight-diameter values under one sieve 
nest arrangement to another sieve nest arrangement with 
any precision.

The very high degree of correlation obtained between 
any two sieve nest arrangements indicates that any one of 
the sieve arrangements used, on the average, is very simi-
lar to any of the others used and no one arrangement is 
better than another for the rather arbitrary wet sieving 
procedure.

Either the full-height or the half-height nest without the 
0.1-mm. sieve gives least variability, greatest ease of han-
dling, and smallest space requirements for drying. Since 
the half-height nest without the 0.1-mm. sieve was found 
to be more convenient than the full-height nest, its use is 
recommended.—R. W. WENGEL, Research Assistant; and 
C. B. TANNER, Associate Professor of Soils, University of Wisconsin. The authors are 
indebted to J. H. Torrie, Professor of Agronomy, for his advice on statistical procedure and interpretation.

PROGENY PERFORMANCE OF FLUORESCENCE IN ANDREW OATS

RECENTLY Finkner et al.2 reported the fluorescent reac-
tion of the seed of 141 oat varieties and of F2 popula-
tions from 23 crosses under ultraviolet light. They found 
variations in shade of fluorescence within some varieties, 
but most entries could definitely be classified either as fluores-
cent or non-fluorescent.

This is a preliminary report of a study to determine (1) 
the breeding behavior of fluorescence in certain selected 
 oats progenies, and (2) the influence of environment on 
fluorescence.

METHODS

Two classes of seed, non-fluorescent and fluorescent, were selected 

from a certified seed lot of Andrew C.I. 470° oats which is pre-
dominantly non-fluorescent but normally contains a low percent-
age of fluorescent seed. These 2 classes of seed were space-planted 
at 6-inch intervals in the field in February, 1953. At maturity, the 

1 Joint contribution from the Agronomy and Botany and Plant 
Pathology Departments, Oklahoma A & M College and the Field 
Crops Research Branch, A.R.S., U.S.D.A. Received April 7, 1956.
2 Finkner, R. E., Murphy, H. C., Atkins, R. E., and West, D. W. 
Varietal reaction and inheritance of fluorescence in oats. Agron. 
Jour. 46:270-274. 1954.
3 C.I. accession number of the Cereal Crops Section, U.S.D.A. 

results and discussion

A detailed examination of progenies of Andrew oats 
grown in 1953 from both non-fluorescent and fluorescent 
seed shows that environment exerts a considerable influ-
ence on the fluorescent reaction. Of 47 progenies resulting 
from non-fluorescent seed, only 12 were classified as pure 
non-fluorescent, whereas 35, or 75%, showed some fluores-
cence in a portion of the seeds within the panicles. Exami-
nation of 1,723 progeny seeds from 47 non-fluorescent 
parents showed the following:

<table>
<thead>
<tr>
<th>Fluorescence Class</th>
<th>Number of Seeds</th>
</tr>
</thead>
<tbody>
<tr>
<td>non-fluorescent</td>
<td>1,033</td>
</tr>
<tr>
<td>fluorescent</td>
<td>413</td>
</tr>
<tr>
<td>intermediate</td>
<td>413</td>
</tr>
<tr>
<td>total</td>
<td>1,723</td>
</tr>
</tbody>
</table>

Of the 41 progenies originating from fluorescent seed, 
40 were classified as fluorescent and only 1 was part 
non-fluorescent and intermediate.

The environmental conditions in the spring of 1953 were 
such that early spring growth was good; however, unsa-
sonably high temperatures accompanied by high winds in late 
May and early June resulted in “burning” of foliage, break-
age of stems, numerous "blasted" and shriveled seeds and 
much "abnormal" lodging. The occurrence of these condi-
tions suggests that physiological stresses took place in the 
 oat plants and may have resulted in an upset in the normal 
processes for development of fluorescent and/or non-fluo-
rescent compounds. The different shades of fluorescence 
within some varieties as reported by Finkner et al.6 may also 
have resulted from environmental effects.

Table 1 shows data obtained from plants grown in 1954. 
Variation of the fluorescence character within a panicle 
was much less in 1954 than in 1953. Variation within a 
panicle was observed in only 1 progeny; all the remaining 
progenies from seeds classified as intermediate in 1953 
were classed as non-fluorescent in 1954. Two plants grown 