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War on Weeds

E. M. Hildebrand

Plant Growth Regulators

Special Projects Division, Chemical Warfare Service

Technical Papers

U. S. News and Notes

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<tr>
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<tr>
<td>3000</td>
<td>0%</td>
</tr>
<tr>
<td>4000</td>
<td>1%</td>
</tr>
<tr>
<td>5000</td>
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When this chart has been constructed, the procedure consists simply of the sequential plotting against \( n \) (number of items examined) of the number of defects observed, \( d \), for which the vertical scale is used. This is continued until the plotted line runs either into the area of acceptance or into that of rejection. The dotted line in the figure shows how a set of results would lead, for example, to acceptance.

The equations for the two lines that mark the margins of acceptance and of rejection are derived from the following set of inequalities:

\[
\begin{align*}
B.14 & \quad \frac{p_2(1-p_2)n-d}{p_1(1-p_1)n-d} > \frac{a}{b} \quad \text{Accept} \quad p = p_2 \quad A \\
& \quad < \frac{a}{b} \quad \text{Reject} \quad p = p_1
\end{align*}
\]

By taking logarithms, this becomes

\[
B.15 \quad d \log \frac{p_2}{p_1} - (n-d) \log \frac{1-p_1}{1-p_2} = \frac{a}{b}
\]

in which \( a = \log A \) and \( b = \log B \).

From the first inequality in B.15, the marginal line is obtained by \( d_2 = h_2 + sn \); from the second inequality in B.15, the marginal line is obtained by \( d_1 = h_1 + sn \). In these, \( s, h_1, \) and \( h_2 \) are parameters dependent on \( p_1, p_2, \alpha \) and \( \beta \).

In the inequalities, \( A \) and \( B \) (for which \( a \) and \( b \) are the logarithms) are so determined that, if \( H_1 \) is true, the probability will be \( \alpha \), or less, that \( H_2 \) will be accepted; and so that, if \( H_2 \) is true, the probability will be \( \beta \), or less, that \( H_1 \) will be accepted. Thus, whenever \( H_2 \) is accepted, \( p_2 \geq A p_1 \) and the total probability of obtaining a sample that will lead to the acceptance of \( H_2 \) is at least \( A \) times as large when \( H_2 \) is true as when

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