that readily accept high K nectar. Due to the behavioral phenomenon of adaptation it might be possible, using high K sugar solutions, to precondition colonies of honey bees prior to placing them on blooming onion fields. Another approach might be to develop strains of honey bees that readily accept high K onion nectar. Knowing that high K is characteristic of onion nectar, it is now possible to evaluate colonies of honey bees to determine the proportion of returning foragers carrying onion nectar, and thus identify genetic stocks of bees that show an acceptance of or preference for onion nectar. The utilization of other pollinator species provides a third possible method.

**Literature Cited**


**Combining Ability of Two Degenerative Sweet Corn Mutants II**

W. H. Lachman

*University of Massachusetts, Amherst*

**Abstract.** Two degenerative sweet corn mutants, C30, a mutant of P39, 'Pee Wee' a mutant of C30 and P39 were crossed with sweet corn inbred C15 to determine their relative abilities to promote heterosis in hybrids. Of the 3 inbreds, C30 had the greatest ability to promote heterosis when in combination with C15; 'Pee Wee' was least effective. Evidently, not all degenerative mutants are capable of promoting marked heterotic effects.

Jones (2) noted that mutations from inbred strains of corn usually either decrease growth and productiveness or clearly reduce plants to some degree. When certain reduced mutant lines were crossed with their normal parent lines they displayed heterosis; the degenerate changes did not reduce the yield of their offspring in crosses to unrelated lines and may have increased yields.

Sweet corn inbred C30, a mutant from inbred P39 is similar to P39 in every respect except smaller. Singleton (4) found that plants of P39 x C30 grew more rapidly and produced ears weighing 25 percent more than the P39 inbred. When C30 and P39 were each crossed to C13, the C30 x C13 cross yielded in some cases significantly more than the P39 x C13 hybrids. The difference was even more pronounced when P39 and C30 were crossed by C15 (5).

'Pee Wee', a diminutive form of C30 was discovered recently in selfed material of normal C30. 'Pee Wee' appears to be similar in all respects to C30, only smaller. According to Galinat3 the gene responsible for 'Pee Wee' is an allele of the *rd* gene and recessive to it, as well as recessive to normal. He suggests that 'Pee Wee' be given the symbol *rd*Pw with the allelic series being *Rd*, *rd* and *rd*Pw.

Lachman (3) conducted tests to compare the combining ability of 'Pee Wee' with that of P39 and C30. 'Pee Wee', C30 and P39 were crossed with each other and with 4 unrelated inbreds including 2 strains of C13. In these tests C30 often exceeded P39 in the promotion of hybrid vigor but 'Pee Wee' was relatively impotent in stimulating heterotic effects.

Materials and Methods

The considerable degree of heterosis demonstrated by C30 x C15 in Singleton's experiments (5) suggested that perhaps crosses of 'Pee Wee' with C15 might result in an even greater heterotic influence. A wide search for seed of inbred C15 indicated that it might be lost but seed was finally located at the Wis. Agr. Exp. Sta. and made available through the kindness of Dr. R. H. Andrew.

The 3 F1 hybrids, P39 x C15, C30 x C15, and 'Pee Wee' x C15 were planted in a randomized block and replicated 6 times. The data recorded individually from 20 plants in each row included height of plants and length and wt of ears. The readings were made at about the time of best eating maturity for each hybrid. The data were analyzed by an Analysis of Variance and Duncan's Multiple Range Test (1) was used to distinguish among the means.

Results

In Table 1 it is shown that when inbreds P39, C30, and 'Pee Wee' were crossed with C15, the performance of hybrids C30 x C15 and P39 x C15 was not significantly different with respect to plant height, but both of them were significantly taller than 'Pee Wee' x C15. The ears of C30 x C15 were significantly heavier than either P39 x C15 or 'Pee Wee' x C15. The latter 2 hybrids did not differ significantly. With respect to ear length, P39 x C15 was longest, C30 x C15 intermediate, and 'Pee Wee' x C15 the shortest; the hybrids all differed significantly from one another.

In general this report corroborates the work of Singleton (5) who discovered the remarkable heterotic effects derivable from the degenerative C30 inbred. Where the development of greater plant height, ear length, and ear wt are used as criteria of vigor, 'Pee Wee' does not cause increased heterosis in its hybrids over comparable hybrids made with either P39 or C30. Evidently 'Pee Wee' did not accumulate associated factors responsible for increasing combining ability to the extent that C30 did. Therefore, it is evident that not all degenerative corn mutants become effective in promoting notable heterotic effects.

<table>
<thead>
<tr>
<th>Pedigree</th>
<th>Plant height-cm</th>
<th>Statistical Significance</th>
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</thead>
<tbody>
<tr>
<td>C30 x C15</td>
<td>248.22</td>
<td>a</td>
</tr>
<tr>
<td>P39 x C15</td>
<td>245.76</td>
<td>a</td>
</tr>
<tr>
<td>'Pee Wee' x C15</td>
<td>225.49</td>
<td>b</td>
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<table>
<thead>
<tr>
<th>Pedigree</th>
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<th>Statistical Significance</th>
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<td>C30 x C15</td>
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<td>a</td>
</tr>
<tr>
<td>P39 x C15</td>
<td>214.82</td>
<td>b</td>
</tr>
<tr>
<td>'Pee Wee' x C15</td>
<td>201.68</td>
<td>b</td>
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<table>
<thead>
<tr>
<th>Pedigree</th>
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<tbody>
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<td>P39 x C15</td>
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<td>a</td>
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<tr>
<td>C30 x C15</td>
<td>18.625</td>
<td>b</td>
</tr>
<tr>
<td>'Pee Wee' x C15</td>
<td>17.550</td>
<td>c</td>
</tr>
</tbody>
</table>

Means in a column not followed by the same letter are significantly different at the 5% level of probability.

Literature Cited

5. ______. 1943. Breeding behavior of C30 a diminutive P39 mutant whose hybrids show increased vigor. Genetics 28:89 (Abstr.).