APPENDIX A

Table Al—Actual and estimated values of corn yield using estimate No. 2, Fort Collins, Colorado 1972 irrigation experiment

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( x_1 )</th>
<th>( x_2 )</th>
<th>( y_1 )</th>
<th>( \hat{y}_1 )</th>
<th>( (y_1 - \hat{y}_1) )</th>
<th>Relative deviation ( ^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>.27</td>
<td>6</td>
<td>7,128</td>
<td>7,059</td>
<td>68</td>
<td>1</td>
</tr>
<tr>
<td>3AI</td>
<td>.42</td>
<td>7</td>
<td>9,450</td>
<td>7,990</td>
<td>1,460</td>
<td>15</td>
</tr>
<tr>
<td>4A</td>
<td>.65</td>
<td>0</td>
<td>10,130</td>
<td>9,720</td>
<td>410</td>
<td>4</td>
</tr>
<tr>
<td>1B</td>
<td>.36</td>
<td>5</td>
<td>7,142</td>
<td>7,959</td>
<td>-817</td>
<td>-11</td>
</tr>
<tr>
<td>3B</td>
<td>.47</td>
<td>2</td>
<td>9,037</td>
<td>8,967</td>
<td>70</td>
<td>1</td>
</tr>
<tr>
<td>4B</td>
<td>.84</td>
<td>0</td>
<td>9,972</td>
<td>9,872</td>
<td>100</td>
<td>1</td>
</tr>
<tr>
<td>1C</td>
<td>.38</td>
<td>9</td>
<td>6,817</td>
<td>7,511</td>
<td>-694</td>
<td>-10</td>
</tr>
<tr>
<td>3C</td>
<td>1.00</td>
<td>5</td>
<td>8,906</td>
<td>9,049</td>
<td>-143</td>
<td>-2</td>
</tr>
<tr>
<td>4C</td>
<td>1.00</td>
<td>0</td>
<td>9,553</td>
<td>9,917</td>
<td>-364</td>
<td>-4</td>
</tr>
<tr>
<td>5</td>
<td>1.00</td>
<td>0</td>
<td>9,899</td>
<td>9,917</td>
<td>-118</td>
<td>-1</td>
</tr>
</tbody>
</table>

1/ See text for the definition of the variables.

2/ Computed as \( \frac{(y_1 - \hat{y}_1)}{y_1} \times 100 \).
Table A2--Marginal product of $x_1^*$ for selected combinations of $x_1^*$ and $x_2$,
based on Estimate 2

<table>
<thead>
<tr>
<th>Variables' values</th>
<th>$\gamma$</th>
<th>MP$_{x_1}^*$</th>
<th>Relative marginal product $^3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$x_1$</td>
<td>$x_2$</td>
<td>$\gamma$</td>
<td>10</td>
</tr>
<tr>
<td>0.30</td>
<td>0</td>
<td>8,211</td>
<td>10</td>
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<td>0.30</td>
<td>5</td>
<td>7,492</td>
<td>92</td>
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<tr>
<td>0.30</td>
<td>10</td>
<td>6,836</td>
<td>84</td>
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<tr>
<td>0.50</td>
<td>0</td>
<td>9,405</td>
<td>32</td>
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<tr>
<td>0.50</td>
<td>5</td>
<td>8,581</td>
<td>29</td>
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<td>0.50</td>
<td>10</td>
<td>7,830</td>
<td>26</td>
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<tr>
<td>0.75</td>
<td>0</td>
<td>9,820</td>
<td>7.4</td>
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<tr>
<td>0.75</td>
<td>5</td>
<td>8,960</td>
<td>6.7</td>
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<tr>
<td>0.75</td>
<td>10</td>
<td>8,175</td>
<td>6.1</td>
</tr>
<tr>
<td>1.00</td>
<td>0</td>
<td>9,917</td>
<td>1.72</td>
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<tr>
<td>1.00</td>
<td>5</td>
<td>9,048</td>
<td>1.57</td>
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<tr>
<td>1.00</td>
<td>10</td>
<td>8,257</td>
<td>1.43</td>
</tr>
</tbody>
</table>

$^1$ See text for the definition of the variables.

$^2$ Computed according to (3) in text.

$^3$ Computed as $(MP_{x_1}/\hat{A}) \times 100$. 
Figure A2—Level of soil moisture in corn irrigation experiment, Fort Collins, Colorado, 1972.

Treatment 3A (3 irrigations: July 13, July 25, Aug. 8)

Soil Moisture Depletion (cm)

Percent of Soil Moisture Depleted

0  2  4  6  8  10  12  14  16  18

0  15  Aug. 15  Sept. 15

15  15  15  15  15  15

Figure A3—Level of soil moisture in corn irrigation experiment. Fort Collins, Colorado, 1972. Treatment 4A (4 irrigations: June 28, July 13, July 25, Aug. 8).
Figure A5 - Level of soil moisture in corn experiment, Ft. Collins, Colorado, 1972. Treatment 18

(Note: Irrigation, July 31)
Figure A6: Level of soil moisture in corn experiment, Fort Collins, Colorado, 1972. Treatment 1C (one irrigation, Aug. 4).
Figure A7 - Level of soil moisture in corn experiment, Fort Collins, Colorado, 1972. Treatment 3B
(3 irrigations, June 13, July 28, Aug. 11)
Figure A8—Level of soil moisture in corn experiment, Fort Collins, Colorado, 1972. Treatment 3C (3 irrigations, June 13, Aug. 2, Aug. 21).
Figure A9—Level of soil moisture in corn experiment, Fort Collins, Colorado, 1972. Treatment 4B (4 irrigations, June 13 & 28, July 28, Aug. 11)
Figure All-Corn grain yield vs. number of "critical days" in the non-reproductive period, Ft. Collins, 1972
Figure A12: Level of soil moisture in corn experiment, Fort Collins, Colorado, 1968, Treatment I

Percent available soil moisture depleted - top 2 feet

Percent gravitational soil moisture
Figure A13—Level of soil moisture in corn experiment, Fort Collins, Colorado, Treatment II

Percent Gravimetric Soil Moisture

July 3 6 9 12 15 18 21 24 27 30
August 3 6 9 12 15 18 21 24 27 30

FC: Field Capacity
45%: Top 2 feet soil moisture depleted

Number of critical days in the non-reproductive period, Fr. Collins, 1972.
Figure A15--Level of soil moisture in corn experiment, Fort Collins, Colorado, 1968, Treatment IV

Percent Gravimetric Soil Moisture

July 3  6  9  12  15  18  21  24  27  30
August 3  6  9  12  15  18  21  24  27  30

Percent available soil moisture depleted:

- 45%
- 50%
- 55%
Percent available soil moisture depleted - top 2 feet

Chart showing predicted soil moisture vs. measured soil moisture in various irrigation treatments.

(Naglehau-Toom)
APPENDIX B

Charts showing predicted soil moisture vs. measured soil moisture with various irrigation treatments.

(Neghassi-Young Experiment)
FIG. B2 - TREATMENT 1B -- ONE 5 CM IRRIGATION
FIG. 4 TREATMENT 3A -- THREE 5 CM IRRIGATION
FIG. B9 — TREATMENT 4C — FOUR 5 CM IRRIGATION
FIG. B10  TREATMENT 5 -- FIVE 5 CM IRRIGATION