PROJECT TITLE: Weed Management in California Wheat 2013-2014

Project Leaders
Steve Wright

UC Cooperative Extension Tulare and Kings Counties
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Abstract/Summary of Results and Conclusions

Broadleaf and grassy weeds are problematic in cereal production, posing challenges to growers in the selection of effective herbicides. Many growers are interested in combining different treatments in one tank mixture in order to cut costs and labor. However, when mixing different herbicides, new concerns about crop safety call for more research in tank mixture options. Research was conducted in the San Joaquin Valley in the 2013-2014 production season, generally focusing on the interactions between several different herbicides at varying rates, with and without a surfactant, when applied as a tank mixture. After trials were completed, it was noted that no treatment in any trial caused severe or lasting injury, and what little amount of injury there was did not significantly vary between trials. Simplicity grass and broadleaf herbicide was widely used and further research was done. Simplicity tank mixed with Express gave outstanding weed control and compared evenly with Express + MCPA + Axial tankmix. All treatments with ET and Shark gave greater injury than the Express treatment. All treatment combinations with Express gave good control of sheperdspurse, burning nettle, chickweed, and swinecress.

Introduction and Objectives

Wheat is one of the most important crops throughout California, and for small grain producers, weeds pose a significant problem that nearly always requires treatment. Although broadleaf and grassy weeds can be reduced by crop rotation and tillage, these cultural practices are being replaced by greater dependence on herbicides. In addition, this dependence raised concern about the evolution of herbicide-resistant weeds.

Recently, several new small grain herbicides have been released to the market and have been successfully used in different parts of the country. Growers in California are hesitant to use these herbicide combinations because they are unsure about the crop injury that could result from a chemical that they are unfamiliar with. Research in this area of the country was necessary to evaluate the safety of these new herbicides and to provide confidence for California growers.
This trial was conducted in Tulare, CA on November 27, 2013. Plot sizes were 8' x 25' with 4 replications. Herbicides used in the trial were Express, MCPA, Axial, 2,4-D, and Clarity. The treatments were applied by hand with a CO₂-pressurized backpack sprayer at 30 PSI, with TeeJet 8002 flat fan nozzles, and calibrated to deliver with a spray volume of 15 GPA at 3 mph. Spray height was maintained at 18 to 24 inches above wheat. Wheat was at the 4-6 leaf stage and 4-7 "tall. Weeds present at the time of application: shepherdspurse (Capsella bursa-pastoris) (1-2” tall), common chickweed (Stellaria media) (1-2” diameter), burning nettle (Urtica urens) (1/2-1" tall), and swinecress (Coronopus didymus) (1-2” tall). Evaluations were taken every 7 days after treatment (DAT). All treatment combinations with Express gave good control of shepherdspurse, burning nettle, chickweed, and swinecress. Due to frost we ended up with some frost damage on the crop. Treatments with Osprey had the most injury lasting 28 days.

Table 1.

Percent Wheat (Triticum) Injury

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Rate/A</th>
<th>4-Dec 7 DAT</th>
<th>11-Dec 14 DAT</th>
<th>18-Dec 21 DAT</th>
<th>1-Jan 28 DAT</th>
<th>15-Jan 36 DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Express + MCPA Amine + Axial + NIS</td>
<td>0.25 oz + 1 pt + 16.4 floz + 0.25%</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>2. Express + MCPA Amine + Axial + NIS</td>
<td>0.5 oz + 1 pt + 16.4 floz + 0.25%</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>3. Express + MCPA Amine + Axial</td>
<td>0.25 oz + 1 pt + 16.4 floz</td>
<td>0</td>
<td>0</td>
<td>5</td>
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<td>3</td>
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<tr>
<td>4. Express + MCPA Amine + Axial</td>
<td>0.5 oz + 1 pt + 16.4 floz</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>5</td>
<td>2</td>
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<tr>
<td>5. Express + MCPA Amine + Axial + NIS</td>
<td>0.25 oz + 12 floz + 16.4 floz + 0.25%</td>
<td>0</td>
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<td>6</td>
<td>5</td>
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<td>6. Express + MCPA Amine + Axial + NIS</td>
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<tr>
<td>7. Express + MCPA Amine + Axial</td>
<td>0.25 oz + 12 floz + 16.4 floz</td>
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<td>5</td>
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<tr>
<td>8. Express + MCPA Amine + Axial</td>
<td>0.5 oz + 12 floz + 16.4 floz</td>
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<tr>
<td>9. Express + 2,4-D + Axial + NIS</td>
<td>0.25 oz + 1 pt + 16.4 floz + 0.25%</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>5</td>
<td>3</td>
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<tr>
<td>10. Express + 2,4-D + Axial + NIS</td>
<td>0.5 oz + 1 pt + 16.4 floz + 0.25%</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>11. Express + 2,4-D + Axial</td>
<td>0.25 oz + 1 pt + 16.4 floz</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>5</td>
<td>2</td>
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<tr>
<td>12. Express + 2,4-D + Axial</td>
<td>0.5 oz + 1 pt + 16.4 floz</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>5</td>
<td>3</td>
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<tr>
<td>13. Express + 2,4-D + Axial + NIS</td>
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<td>0</td>
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<td>5</td>
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</tr>
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<td>14. Express + 2,4-D + Axial + NIS</td>
<td>0.5 oz + 12 floz + 16.4 floz + 0.25%</td>
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<td>0</td>
<td>5</td>
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<td>2</td>
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<td>15. Express + 2,4-D + Axial</td>
<td>0.25 oz + 12 floz + 16.4 floz</td>
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<td>6</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>16. Express + 2,4-D + Axial</td>
<td>0.5 oz + 12 floz + 16.4 floz</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>17. Express + Clarity + Axial + NIS</td>
<td>0.25 oz + 4 floz + 16.4 floz + 0.25%</td>
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<td>0</td>
<td>7</td>
<td>5</td>
<td>3</td>
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<tr>
<td>18. Express + Clarity + Axial + NIS</td>
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<td>0</td>
<td>7</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>19. Express + Clarity + Axial</td>
<td>0.25 oz + 4 floz + 16.4 floz</td>
<td>0</td>
<td>0</td>
<td>9</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>20. Express + Clarity + Axial</td>
<td>0.5 oz + 4 floz + 16.4 floz</td>
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<td>5</td>
<td>3</td>
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Table 2.

Shepherdspurse (*Capsella bursa-pastoris*) Percent Control

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Rate/A</th>
<th>4-Dec 7 DAT</th>
<th>11-Dec 14 DAT</th>
<th>18-Dec 21 DAT</th>
<th>1-Jan 28 DAT</th>
<th>15-Jan 36 DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Express + MCPA Amine + Axial + NIS</td>
<td>0.25 oz + 1 pt + 16.4 floz + 0.25%</td>
<td>2</td>
<td>8</td>
<td>48</td>
<td>65</td>
<td>91</td>
</tr>
<tr>
<td>2. Express + MCPA Amine + Axial + NIS</td>
<td>0.5 oz + 1 pt + 16.4 floz + 0.25%</td>
<td>2</td>
<td>11</td>
<td>48</td>
<td>65</td>
<td>93</td>
</tr>
<tr>
<td>3. Express + MCPA Amine + Axial</td>
<td>0.25 oz + 1 pt + 16.4 floz</td>
<td>2</td>
<td>9</td>
<td>38</td>
<td>68</td>
<td>88</td>
</tr>
<tr>
<td>4. Express + MCPA Amine + Axial</td>
<td>0.5 oz + 1 pt + 16.4 floz</td>
<td>2</td>
<td>10</td>
<td>43</td>
<td>65</td>
<td>91</td>
</tr>
<tr>
<td>5. Express + MCPA Amine + Axial + NIS</td>
<td>0.25 oz + 12 floz + 16.4 floz + 0.25%</td>
<td>2</td>
<td>10</td>
<td>45</td>
<td>55</td>
<td>90</td>
</tr>
<tr>
<td>6. Express + MCPA Amine + Axial + NIS</td>
<td>0.5 oz + 12 floz + 16.4 floz + 0.25%</td>
<td>2</td>
<td>10</td>
<td>45</td>
<td>59</td>
<td>91</td>
</tr>
<tr>
<td>7. Express + MCPA Amine + Axial</td>
<td>0.25 oz + 12 floz + 16.4 floz</td>
<td>2</td>
<td>8</td>
<td>50</td>
<td>54</td>
<td>95</td>
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<tr>
<td>8. Express + MCPA Amine + Axial</td>
<td>0.5 oz + 12 floz + 16.4 floz</td>
<td>4</td>
<td>10</td>
<td>53</td>
<td>64</td>
<td>89</td>
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<tr>
<td>9. Express + 2,4-D + Axial + NIS</td>
<td>0.25 oz + 1 pt + 16.4 floz + 0.25%</td>
<td>3</td>
<td>10</td>
<td>50</td>
<td>59</td>
<td>90</td>
</tr>
<tr>
<td>10. Express + 2,4-D + Axial + NIS</td>
<td>0.5 oz + 1 pt + 16.4 floz + 0.25%</td>
<td>2</td>
<td>10</td>
<td>50</td>
<td>60</td>
<td>88</td>
</tr>
<tr>
<td>11. Express + 2,4-D + Axial</td>
<td>0.25 oz + 1 pt + 16.4 floz</td>
<td>2</td>
<td>10</td>
<td>50</td>
<td>61</td>
<td>93</td>
</tr>
<tr>
<td>12. Express + 2,4-D + Axial</td>
<td>0.5 oz + 1 pt + 16.4 floz</td>
<td>1</td>
<td>8</td>
<td>45</td>
<td>65</td>
<td>91</td>
</tr>
<tr>
<td>13. Express + 2,4-D + Axial + NIS</td>
<td>0.25 oz + 12 floz + 16.4 floz + 0.25%</td>
<td>2</td>
<td>10</td>
<td>58</td>
<td>64</td>
<td>94</td>
</tr>
<tr>
<td>14. Express + 2,4-D + Axial + NIS</td>
<td>0.5 oz + 12 floz + 16.4 floz + 0.25%</td>
<td>3</td>
<td>9</td>
<td>43</td>
<td>53</td>
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<tr>
<td>15. Express + 2,4-D + Axial</td>
<td>0.25 oz + 12 floz + 16.4 floz</td>
<td>2</td>
<td>9</td>
<td>48</td>
<td>50</td>
<td>94</td>
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<tr>
<td>16. Express + 2,4-D + Axial</td>
<td>0.5 oz + 12 floz + 16.4 floz</td>
<td>2</td>
<td>10</td>
<td>55</td>
<td>58</td>
<td>90</td>
</tr>
<tr>
<td>17. Express + Clarity + Axial + NIS</td>
<td>0.25 oz + 4 floz + 16.4 floz + 0.25%</td>
<td>2</td>
<td>14</td>
<td>58</td>
<td>63</td>
<td>94</td>
</tr>
<tr>
<td>18. Express + Clarity + Axial + NIS</td>
<td>0.5 oz + 4 floz + 16.4 floz + 0.25%</td>
<td>2</td>
<td>11</td>
<td>38</td>
<td>46</td>
<td>89</td>
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<tr>
<td>19. Express + Clarity + Axial</td>
<td>0.25 oz + 4 floz + 16.4 floz</td>
<td>2</td>
<td>11</td>
<td>40</td>
<td>48</td>
<td>91</td>
</tr>
<tr>
<td>20. Express + Clarity + Axial</td>
<td>0.5 oz + 4 floz + 16.4 floz</td>
<td>1</td>
<td>3</td>
<td>55</td>
<td>60</td>
<td>89</td>
</tr>
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<td>21. UTC</td>
<td>-----</td>
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</table>

Table 3.

Burning Nettle (*Urtica urens*) Percent Control

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Rate/A</th>
<th>4-Dec 7 DAT</th>
<th>11-Dec 14 DAT</th>
<th>18-Dec 21 DAT</th>
<th>1-Jan 28 DAT</th>
<th>15-Jan 36 DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Express + MCPA Amine + Axial + NIS</td>
<td>0.25 oz + 1 pt + 16.4 floz + 0.25%</td>
<td>2</td>
<td>1</td>
<td>30</td>
<td>30</td>
<td>90</td>
</tr>
<tr>
<td>2. Express + MCPA Amine + Axial + NIS</td>
<td>0.5 oz + 1 pt + 16.4 floz + 0.25%</td>
<td>0</td>
<td>10</td>
<td>80</td>
<td>90</td>
<td>98</td>
</tr>
<tr>
<td>3. Express + MCPA Amine + Axial</td>
<td>0.25 oz + 1 pt + 16.4 floz</td>
<td>0</td>
<td>1</td>
<td>20</td>
<td>45</td>
<td>90</td>
</tr>
<tr>
<td>4. Express + MCPA Amine + Axial</td>
<td>0.5 oz + 1 pt + 16.4 floz</td>
<td>0</td>
<td>10</td>
<td>45</td>
<td>90</td>
<td>100</td>
</tr>
<tr>
<td>5. Express + MCPA Amine + Axial + NIS</td>
<td>0.25 oz + 12 floz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6. Express + MCPA Amine + Axial + NIS</td>
<td>0.5 oz + 12 floz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>5</td>
<td>-</td>
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<tr>
<td>7. Express + MCPA Amine + Axial</td>
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<td>-</td>
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<tr>
<td>8. Express + MCPA Amine + Axial</td>
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<td>0</td>
<td>0</td>
<td>-</td>
<td>90</td>
<td>100</td>
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<tr>
<td>9. Express + 2,4-D + Axial + NIS</td>
<td>0.25 oz + 1 pt + 16.4 floz + 0.25%</td>
<td>0</td>
<td>1</td>
<td>50</td>
<td>55</td>
<td>90</td>
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<tr>
<td>10. Express + 2,4-D + Axial + NIS</td>
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<td>-</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>11. Express + 2,4-D + Axial</td>
<td>0.25 oz + 1 pt + 16.4 floz</td>
<td>2</td>
<td>8</td>
<td>40</td>
<td>50</td>
<td>95</td>
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<tr>
<td>12. Express + 2,4-D + Axial</td>
<td>0.5 oz + 1 pt + 16.4 floz</td>
<td>2</td>
<td>0</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>13. Express + 2,4-D + Axial + NIS</td>
<td>0.25 oz + 12 floz + 16.4 floz + 0.25%</td>
<td>2</td>
<td>0</td>
<td>-</td>
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</tr>
<tr>
<td>14. Express + 2,4-D + Axial + NIS</td>
<td>0.5 oz + 12 floz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>15. Express + 2,4-D + Axial</td>
<td>0.25 oz + 12 floz + 16.4 floz</td>
<td>0</td>
<td>0</td>
<td>50</td>
<td>90</td>
<td>100</td>
</tr>
<tr>
<td>16. Express + 2,4-D + Axial</td>
<td>0.5 oz + 12 floz + 16.4 floz</td>
<td>0</td>
<td>0</td>
<td>30</td>
<td>35</td>
<td>90</td>
</tr>
<tr>
<td>17. Express + Clarity + Axial + NIS</td>
<td>0.25 oz + 4 floz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>0</td>
<td>60</td>
<td>75</td>
<td>100</td>
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<td>18. Express + Clarity + Axial + NIS</td>
<td>0.5 oz + 4 floz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>19. Express + Clarity + Axial</td>
<td>0.25 oz + 4 floz + 16.4 floz</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
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<td>0.5 oz + 4 floz + 16.4 floz</td>
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<td>0</td>
<td>-</td>
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### Table 4.

**Common Chickweed (Stellaria media) Percent Control**

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<th>Treatments</th>
<th>Rate/A</th>
<th>4-Dec DAT</th>
<th>11-Dec DAT</th>
<th>18-Dec DAT</th>
<th>28 DAT</th>
<th>36 DAT</th>
</tr>
</thead>
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<tr>
<td>1. Express + MCPA Amine + Axial + NIS</td>
<td>0.25 oz + 1 pt + 16.4 floz + 0.25%</td>
<td>0</td>
<td>3</td>
<td>23</td>
<td>56</td>
<td>96</td>
</tr>
<tr>
<td>2. Express + MCPA Amine + Axial + NIS</td>
<td>0.5 oz + 1 pt + 16.4 floz + 0.25%</td>
<td>0</td>
<td>5</td>
<td>19</td>
<td>45</td>
<td>96</td>
</tr>
<tr>
<td>3. Express + MCPA Amine + Axial</td>
<td>0.25 oz + 1 pt + 16.4 floz</td>
<td>0</td>
<td>6</td>
<td>25</td>
<td>80</td>
<td>99</td>
</tr>
<tr>
<td>4. Express + MCPA Amine + Axial</td>
<td>0.5 oz + 1 pt + 16.4 floz</td>
<td>0</td>
<td>4</td>
<td>23</td>
<td>60</td>
<td>96</td>
</tr>
<tr>
<td>5. Express + MCPA Amine + Axial + NIS</td>
<td>0.25 oz + 12 floz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>4</td>
<td>16</td>
<td>61</td>
<td>93</td>
</tr>
<tr>
<td>6. Express + MCPA Amine + Axial + NIS</td>
<td>0.5 oz + 12 floz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>4</td>
<td>19</td>
<td>50</td>
<td>99</td>
</tr>
<tr>
<td>7. Express + MCPA Amine + Axial</td>
<td>0.25 oz + 12 floz + 16.4 floz</td>
<td>0</td>
<td>5</td>
<td>33</td>
<td>68</td>
<td>94</td>
</tr>
<tr>
<td>8. Express + MCPA Amine + Axial</td>
<td>0.5 oz + 12 floz + 16.4 floz</td>
<td>0</td>
<td>4</td>
<td>29</td>
<td>61</td>
<td>96</td>
</tr>
<tr>
<td>9. Express + 2,4-D + Axial + NIS</td>
<td>0.25 oz + 1 pt + 16.4 floz + 0.25%</td>
<td>0</td>
<td>4</td>
<td>10</td>
<td>54</td>
<td>94</td>
</tr>
<tr>
<td>10. Express + 2,4-D + Axial + NIS</td>
<td>0.5 oz + 1 pt + 16.4 floz + 0.25%</td>
<td>0</td>
<td>5</td>
<td>26</td>
<td>60</td>
<td>93</td>
</tr>
<tr>
<td>11. Express + 2,4-D + Axial</td>
<td>0.25 oz + 1 pt + 16.4 floz</td>
<td>0</td>
<td>7</td>
<td>33</td>
<td>68</td>
<td>94</td>
</tr>
<tr>
<td>12. Express + 2,4-D + Axial</td>
<td>0.5 oz + 1 pt + 16.4 floz</td>
<td>0</td>
<td>4</td>
<td>25</td>
<td>50</td>
<td>99</td>
</tr>
<tr>
<td>13. Express + 2,4-D + Axial + NIS</td>
<td>0.25 oz + 12 floz + 16.4 floz</td>
<td>0</td>
<td>3</td>
<td>19</td>
<td>54</td>
<td>99</td>
</tr>
<tr>
<td>14. Express + 2,4-D + Axial + NIS</td>
<td>0.5 oz + 12 floz + 16.4 floz</td>
<td>0</td>
<td>8</td>
<td>35</td>
<td>60</td>
<td>93</td>
</tr>
<tr>
<td>15. Express + 2,4-D + Axial</td>
<td>0.25 oz + 1 pt + 16.4 floz</td>
<td>0</td>
<td>5</td>
<td>22</td>
<td>54</td>
<td>99</td>
</tr>
<tr>
<td>16. Express + 2,4-D + Axial</td>
<td>0.5 oz + 1 pt + 16.4 floz</td>
<td>0</td>
<td>4</td>
<td>24</td>
<td>49</td>
<td>95</td>
</tr>
<tr>
<td>17. Express + Clarity + Axial + NIS</td>
<td>0.25 oz + 12 floz + 16.4 floz</td>
<td>0</td>
<td>6</td>
<td>25</td>
<td>60</td>
<td>93</td>
</tr>
<tr>
<td>18. Express + Clarity + Axial + NIS</td>
<td>0.5 oz + 12 floz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>4</td>
<td>29</td>
<td>71</td>
<td>96</td>
</tr>
<tr>
<td>19. Express + Clarity + Axial</td>
<td>0.25 oz + 4 floz + 16.4 floz</td>
<td>0</td>
<td>5</td>
<td>28</td>
<td>43</td>
<td>95</td>
</tr>
<tr>
<td>20. Express + Clarity + Axial</td>
<td>0.5 oz + 4 floz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>1</td>
<td>21</td>
<td>51</td>
<td>96</td>
</tr>
<tr>
<td>21. UTC</td>
<td>----</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
</tbody>
</table>

### Table 5.

**Swinecress (Coronopus didymus) Percent Control**

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Rate/A</th>
<th>4-Dec DAT</th>
<th>11-Dec DAT</th>
<th>18-Dec DAT</th>
<th>28 DAT</th>
<th>36 DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Express + MCPA Amine + Axial + NIS</td>
<td>0.25 oz + 1 pt + 16.4 floz + 0.25%</td>
<td>0</td>
<td>3</td>
<td>23</td>
<td>56</td>
<td>96</td>
</tr>
<tr>
<td>2. Express + MCPA Amine + Axial + NIS</td>
<td>0.5 oz + 1 pt + 16.4 floz + 0.25%</td>
<td>0</td>
<td>5</td>
<td>19</td>
<td>45</td>
<td>96</td>
</tr>
<tr>
<td>3. Express + MCPA Amine + Axial</td>
<td>0.25 oz + 1 pt + 16.4 floz</td>
<td>0</td>
<td>6</td>
<td>25</td>
<td>80</td>
<td>99</td>
</tr>
<tr>
<td>4. Express + MCPA Amine + Axial</td>
<td>0.5 oz + 1 pt + 16.4 floz</td>
<td>0</td>
<td>4</td>
<td>23</td>
<td>36</td>
<td>96</td>
</tr>
<tr>
<td>5. Express + MCPA Amine + Axial + NIS</td>
<td>0.25 oz + 12 floz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>4</td>
<td>16</td>
<td>61</td>
<td>93</td>
</tr>
<tr>
<td>6. Express + MCPA Amine + Axial + NIS</td>
<td>0.5 oz + 12 floz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>4</td>
<td>19</td>
<td>50</td>
<td>99</td>
</tr>
<tr>
<td>7. Express + MCPA Amine + Axial</td>
<td>0.25 oz + 12 floz + 16.4 floz</td>
<td>0</td>
<td>5</td>
<td>33</td>
<td>54</td>
<td>99</td>
</tr>
<tr>
<td>8. Express + MCPA Amine + Axial</td>
<td>0.5 oz + 12 floz + 16.4 floz</td>
<td>0</td>
<td>4</td>
<td>18</td>
<td>44</td>
<td>91</td>
</tr>
<tr>
<td>9. Express + 2,4-D + Axial + NIS</td>
<td>0.25 oz + 1 pt + 16.4 floz + 0.25%</td>
<td>0</td>
<td>6</td>
<td>33</td>
<td>60</td>
<td>94</td>
</tr>
<tr>
<td>10. Express + 2,4-D + Axial + NIS</td>
<td>0.5 oz + 1 pt + 16.4 floz + 0.25%</td>
<td>0</td>
<td>8</td>
<td>35</td>
<td>68</td>
<td>94</td>
</tr>
<tr>
<td>11. Express + 2,4-D + Axial</td>
<td>0.25 oz + 1 pt + 16.4 floz</td>
<td>0</td>
<td>7</td>
<td>26</td>
<td>70</td>
<td>98</td>
</tr>
<tr>
<td>12. Express + 2,4-D + Axial</td>
<td>0.5 oz + 1 pt + 16.4 floz</td>
<td>0</td>
<td>4</td>
<td>25</td>
<td>50</td>
<td>99</td>
</tr>
<tr>
<td>13. Express + 2,4-D + Axial + NIS</td>
<td>0.25 oz + 12 floz + 16.4 floz</td>
<td>0</td>
<td>3</td>
<td>19</td>
<td>54</td>
<td>99</td>
</tr>
<tr>
<td>14. Express + 2,4-D + Axial + NIS</td>
<td>0.5 oz + 12 floz + 16.4 floz</td>
<td>0</td>
<td>7</td>
<td>25</td>
<td>56</td>
<td>90</td>
</tr>
<tr>
<td>15. Express + 2,4-D + Axial</td>
<td>0.25 oz + 12 floz + 16.4 floz</td>
<td>0</td>
<td>4</td>
<td>29</td>
<td>61</td>
<td>96</td>
</tr>
<tr>
<td>16. Express + 2,4-D + Axial</td>
<td>0.5 oz + 12 floz + 16.4 floz</td>
<td>0</td>
<td>6</td>
<td>25</td>
<td>71</td>
<td>96</td>
</tr>
<tr>
<td>17. Express + Clarity + Axial + NIS</td>
<td>0.25 oz + 4 floz + 16.4 floz</td>
<td>0</td>
<td>5</td>
<td>28</td>
<td>43</td>
<td>95</td>
</tr>
<tr>
<td>18. Express + Clarity + Axial + NIS</td>
<td>0.5 oz + 4 floz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>5</td>
<td>26</td>
<td>80</td>
<td>93</td>
</tr>
<tr>
<td>19. Express + Clarity + Axial</td>
<td>0.25 oz + 4 floz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>5</td>
<td>28</td>
<td>43</td>
<td>95</td>
</tr>
<tr>
<td>20. Express + Clarity + Axial</td>
<td>0.5 oz + 4 floz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>1</td>
<td>21</td>
<td>51</td>
<td>96</td>
</tr>
<tr>
<td>21. UTC</td>
<td>----</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Broadleaf and Grass Herbicide Tank-Mixture Study in Wheat

This study was conducted in Tulare, CA on November 27, 2013. Plot sizes were 8’ x 25’ with 4 replications. Herbicides used in the trial were Express, MCPA, Axial, Simplicity, and Osprey. The application was applied by hand with a CO2-pressurized backpack sprayer at 30 PSI, with TeeJet 8002 flat fan nozzles, and calibrated to deliver with a spray volume of 15 GPA at 3 mph. Spray height was maintained at 18 to 24 inches above wheat. Wheat was at the 4-6 leaf stage and 4-7 “tall. Weed present at the time of application: shepherdspurse (*Capsella bursa-pastoris*) (1-2” tall), common chickweed (*Stellaria media*) (1-2” diameter), burning nettle (*Urtica urens*) (1/2-1” tall), and swinecress (*Coronopus didymus*) (1-2” tall). Evaluations were taken every 7 days after treatment (DAT). We chose this field because the PCA said it was loaded with wild oat however they never showed up. Due to frost we ended up with some frost damage on the crop. Evaluations were made for broadleaves and we are still compiling the data.

Table 1.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Rate/A</th>
<th>4-Dec 7 DAT</th>
<th>11-Dec 14 DAT</th>
<th>18-Dec 21 DAT</th>
<th>1-Jan 28 DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Express + NIS</td>
<td>0.5 oz + 0.25%</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>2. Simplicity + NIS</td>
<td>6.75 floz + 0.25%</td>
<td>0</td>
<td>0</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>3. Osprey + NIS</td>
<td>4.75 oz + 0.25%</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>4. Axial + NIS</td>
<td>16.4 floz + 0.25%</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>5. Express + Simplicity + NIS</td>
<td>0.25 oz + 6.75 floz + 0.25%</td>
<td>0</td>
<td>0</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>6. Express + Simplicity + NIS</td>
<td>0.375 oz + 6.75 floz + 0.25%</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>7. Express + Simplicity + NIS</td>
<td>0.5 oz + 6.75 floz + 0.25%</td>
<td>0</td>
<td>0</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>8. Express + Osprey + NIS</td>
<td>0.25 oz + 4.75 oz + 0.25%</td>
<td>0</td>
<td>0</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>9. Express + Osprey + NIS</td>
<td>0.375 oz + 4.75 oz + 0.25%</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>10. Express + Osprey + NIS</td>
<td>0.5 oz + 4.75 oz + 0.25%</td>
<td>0</td>
<td>0</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>11. Express + Axial + NIS</td>
<td>0.25 oz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>12. Express + Axial + NIS</td>
<td>0.375 oz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>13. Express + Axial + NIS</td>
<td>0.5 oz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>14. Express + MCPA + Axial + NIS</td>
<td>0.5 oz + 12 floz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>15. Untreated</td>
<td>-----</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>
Italian Ryegrass Tank-Mixture Study in Wheat

This study was conducted in Visalia, CA on February 14, 2014. Plot sizes were 10' x 25' with 4 replications. Herbicides used in the trial were Express, MCPA, Axial, Simplicity, and Osprey. The applications were applied by hand with a CO\textsubscript{2}-pressurized backpack sprayer at 30 PSI, with TeeJet 8002 flat fan nozzles, and calibrated to deliver with a spray volume of 15 GPA at 3 mph. Spray height was maintained at 18 to 24 inches above wheat. Wheat was at the 6-8 leaf stage and 6-10 “tall. Weed present at the time of application: Italian ryegrass \textit{(Lolium multiflorum)} (2-4” tall). Evaluations were taken every 7 days after treatment (DAT). Grower sprayed for broadleaves 2-3 weeks prior. Injury was highest with Osprey combinations. Italian ryegrass was poor because applications were made when there was still heavy dew. This was the fault of the researchers.

Table 1.

<table>
<thead>
<tr>
<th>Percent Wheat (\textit{Triticum}) Injury</th>
<th>21-Feb 7 DAT</th>
<th>21-Mar 28 DAT</th>
<th>14-Mar 28 DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatments</td>
<td>Rate/A</td>
<td>7 DAT</td>
<td>21 DAT</td>
</tr>
<tr>
<td>1. Express + NIS</td>
<td>0.5 oz + 0.25%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2. Simplicity + NIS</td>
<td>6.75 floz + 0.25%</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>3. Osprey + NIS</td>
<td>4.75 oz + 0.25%</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>4. Axial + NIS</td>
<td>16.4 floz + 0.25%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5. Express + Simplicity + NIS</td>
<td>0.25 oz + 6.75 floz + 0.25%</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>6. Express + Simplicity + NIS</td>
<td>0.375 oz + 6.75 floz + 0.25%</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>7. Express + Simplicity + NIS</td>
<td>0.5 oz + 6.75 floz + 0.25%</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>8. Express + Osprey + NIS</td>
<td>0.25 oz + 4.75 oz + 0.25%</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>9. Express + Osprey + NIS</td>
<td>0.375 oz + 4.75 oz + 0.25%</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>10. Express + Osprey + NIS</td>
<td>0.5 oz + 4.75 oz + 0.25%</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>11. Express + Axial + NIS</td>
<td>0.25 oz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>12. Express + Axial + NIS</td>
<td>0.375 oz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>13. Express + Axial + NIS</td>
<td>0.5 oz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>14. Express + MCPA + Axial + NIS</td>
<td>0.5 oz + 12 floz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15. Untreated</td>
<td>-----</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
### Table 2.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Rate/A</th>
<th>21-Feb</th>
<th>7-DAT</th>
<th>7-Mar</th>
<th>21-DAT</th>
<th>14-Mar</th>
<th>28-DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Express + NIS</td>
<td>0.5 oz + 0.25%</td>
<td>0</td>
<td>25</td>
<td>44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Simplicity + NIS</td>
<td>6.75 floz + 0.25%</td>
<td>0</td>
<td>25</td>
<td>36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Osprey + NIS</td>
<td>4.75 oz + 0.25%</td>
<td>0</td>
<td>16</td>
<td>41</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Axial + NIS</td>
<td>16.4 floz + 0.25%</td>
<td>0</td>
<td>38</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Express + Simplicity + NIS</td>
<td>0.25 oz + 6.75 floz + 0.25%</td>
<td>0</td>
<td>21</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Express + Simplicity + NIS</td>
<td>0.375 oz + 6.75 floz + 0.25%</td>
<td>0</td>
<td>30</td>
<td>43</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Express + Simplicity + NIS</td>
<td>0.5 oz + 6.75 floz + 0.25%</td>
<td>0</td>
<td>23</td>
<td>39</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Express + Osprey + NIS</td>
<td>0.25 oz + 4.75 oz + 0.25%</td>
<td>0</td>
<td>34</td>
<td>54</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Express + Osprey + NIS</td>
<td>0.375 oz + 4.75 oz + 0.25%</td>
<td>0</td>
<td>33</td>
<td>53</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Express + Osprey + NIS</td>
<td>0.5 oz + 4.75 oz + 0.25%</td>
<td>0</td>
<td>34</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Express + Axial + NIS</td>
<td>0.25 oz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>35</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Express + Axial + NIS</td>
<td>0.375 oz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>36</td>
<td>63</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Express + Axial + NIS</td>
<td>0.5 oz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>34</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Express + MCPA + Axial + NIS</td>
<td>0.5 oz + 12 floz + 16.4 floz + 0.25%</td>
<td>0</td>
<td>36</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Untreated</td>
<td>-----</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Herbicide Control Study in Wheat**

This study was conducted in Tulare, CA on November 27, 2013. Plot sizes were 8’ x 25’ with 4 replications. Herbicides used in the trial were Express, MCPA, Axial, Simplicity, and Osprey. The applications were applied by hand with a CO₂-pressurized backpack sprayer at 30 PSI, with TeeJet 8002 flat fan nozzles, and calibrated to deliver with a spray volume of 15 GPA at 3 mph. Spray height was maintained at 18 to 24 inches above wheat. Wheat was at the 4-6 leaf stage and 4-7 “tall. Weed present at the time of application: shepherdspurse (*Capsella bursa-pastoris*) (1-2” tall), common chickweed (*Stellaria media*) (1-2” diameter), burning nettle (*Urtica urens*) (1/2-1” tall), and swinecress (*Coronopus didymus*) (1-2” tall). Evaluations were taken every 7 days after treatment (DAT). All treatments, except for the grass herbicide Axial gave good to excellent control of the all the broadleaves evaluated in the study. Simplicity tank mixed with Express gave outstanding weed control and compared evenly with Express + MCPA + Axial tankmix.
Table 1.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Rate/A</th>
<th>4-Dec 7 DAT</th>
<th>11-Dec 14 DAT</th>
<th>18-Dec 21 DAT</th>
<th>8-Jan 41 DAT</th>
<th>15-Jan 48 DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Simplicity + NIS</td>
<td>6.75 floz + 0.5%</td>
<td>0</td>
<td>0</td>
<td>9</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>2. Simplicity + AMS + NIS</td>
<td>6.75 floz + 1.5 lb ai + 0.5%</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>3. Simplicity + COC</td>
<td>6.75 floz + 1.25%</td>
<td>0</td>
<td>0</td>
<td>9</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>4. Osprey + AMS + NIS</td>
<td>4.75 oz + 1.5 lb ai + 0.5%</td>
<td>0</td>
<td>0</td>
<td>13</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>5. Axial</td>
<td>16.4 floz</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>6. Simplicity + Express + NIS</td>
<td>6.75 floz + 0.25 oz + 0.5%</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>7. Simplicity + Express + NIS</td>
<td>6.75 floz + 0.5 oz + 0.5%</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>8. Express + MCPA + Axial</td>
<td>0.25 oz + 16 floz + 16.4 floz</td>
<td>0</td>
<td>0</td>
<td>9</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>9. Express + MCPA + Axial</td>
<td>0.5 oz + 16 floz + 16.4 floz</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>10. Untreated</td>
<td>-----</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 2.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Rate/A</th>
<th>4-Dec 7 DAT</th>
<th>11-Dec 14 DAT</th>
<th>18-Dec 21 DAT</th>
<th>8-Jan 41 DAT</th>
<th>15-Jan 48 DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Simplicity + NIS</td>
<td>6.75 floz + 0.5%</td>
<td>5</td>
<td>35</td>
<td>74</td>
<td>88</td>
<td>98</td>
</tr>
<tr>
<td>2. Simplicity + AMS + NIS</td>
<td>6.75 floz + 1.5 lb ai + 0.5%</td>
<td>5</td>
<td>30</td>
<td>65</td>
<td>80</td>
<td>94</td>
</tr>
<tr>
<td>3. Simplicity + COC</td>
<td>6.75 floz + 1.25%</td>
<td>5</td>
<td>29</td>
<td>53</td>
<td>80</td>
<td>96</td>
</tr>
<tr>
<td>4. Osprey + AMS + NIS</td>
<td>4.75 oz + 1.5 lb ai + 0.5%</td>
<td>5</td>
<td>28</td>
<td>54</td>
<td>84</td>
<td>97</td>
</tr>
<tr>
<td>5. Axial</td>
<td>16.4 floz</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6. Simplicity + Express + NIS</td>
<td>6.75 floz + 0.25 oz + 0.5%</td>
<td>5</td>
<td>16</td>
<td>40</td>
<td>76</td>
<td>95</td>
</tr>
<tr>
<td>7. Simplicity + Express + NIS</td>
<td>6.75 floz + 0.5 oz + 0.5%</td>
<td>5</td>
<td>16</td>
<td>63</td>
<td>85</td>
<td>98</td>
</tr>
<tr>
<td>8. Express + MCPA + Axial</td>
<td>0.25 oz + 16 floz + 16.4 floz</td>
<td>5</td>
<td>16</td>
<td>39</td>
<td>71</td>
<td>93</td>
</tr>
<tr>
<td>9. Express + MCPA + Axial</td>
<td>0.5 oz + 16 floz + 16.4 floz</td>
<td>5</td>
<td>24</td>
<td>54</td>
<td>79</td>
<td>95</td>
</tr>
<tr>
<td>10. Untreated</td>
<td>-----</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 3.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Rate/A</th>
<th>4-Dec 7 DAT</th>
<th>11-Dec 14 DAT</th>
<th>18-Dec 21 DAT</th>
<th>8-Jan 41 DAT</th>
<th>15-Jan 48 DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Simplicity + NIS</td>
<td>6.75 floz + 0.5%</td>
<td>1</td>
<td>29</td>
<td>84</td>
<td>93</td>
<td>98</td>
</tr>
<tr>
<td>2. Simplicity + AMS + NIS</td>
<td>6.75 floz + 1.5 lb ai + 0.5%</td>
<td>2</td>
<td>30</td>
<td>85</td>
<td>95</td>
<td>98</td>
</tr>
<tr>
<td>3. Simplicity + COC</td>
<td>6.75 floz + 1.25%</td>
<td>1</td>
<td>36</td>
<td>81</td>
<td>93</td>
<td>99</td>
</tr>
<tr>
<td>4. Osprey + AMS + NIS</td>
<td>4.75 oz + 1.5 lb ai + 0.5%</td>
<td>2</td>
<td>35</td>
<td>84</td>
<td>98</td>
<td>100</td>
</tr>
<tr>
<td>5. Axial</td>
<td>16.4 floz</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6. Simplicity + Express + NIS</td>
<td>6.75 floz + 0.25 oz + 0.5%</td>
<td>2</td>
<td>38</td>
<td>80</td>
<td>94</td>
<td>100</td>
</tr>
<tr>
<td>7. Simplicity + Express + NIS</td>
<td>6.75 floz + 0.5 oz + 0.5%</td>
<td>3</td>
<td>44</td>
<td>85</td>
<td>95</td>
<td>100</td>
</tr>
<tr>
<td>8. Express + MCPA + Axial</td>
<td>0.25 oz + 16 floz + 16.4 floz</td>
<td>2</td>
<td>33</td>
<td>73</td>
<td>90</td>
<td>99</td>
</tr>
<tr>
<td>9. Express + MCPA + Axial</td>
<td>0.5 oz + 16 floz + 16.4 floz</td>
<td>2</td>
<td>35</td>
<td>75</td>
<td>89</td>
<td>98</td>
</tr>
<tr>
<td>10. Untreated</td>
<td>-----</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Table 4.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Rate/A</th>
<th>4-Dec 7 DAT</th>
<th>11-Dec 14 DAT</th>
<th>18-Dec 21 DAT</th>
<th>8-Jan 41 DAT</th>
<th>15-Jan 48 DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Simplicity + NIS</td>
<td>6.75 floz + 0.5%</td>
<td>0</td>
<td>13</td>
<td>24</td>
<td>78</td>
<td>99</td>
</tr>
<tr>
<td>2. Simplicity + AMS + NIS</td>
<td>6.75 floz + 1.5 lb ai + 0.5%</td>
<td>0</td>
<td>14</td>
<td>25</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>3. Simplicity + COC</td>
<td>6.75 floz + 1.25%</td>
<td>0</td>
<td>10</td>
<td>24</td>
<td>80</td>
<td>99</td>
</tr>
<tr>
<td>4. Osprey + AMS + NIS</td>
<td>4.75 oz + 1.5 lb ai + 0.5%</td>
<td>0</td>
<td>11</td>
<td>25</td>
<td>79</td>
<td>96</td>
</tr>
<tr>
<td>5. Axial</td>
<td>16.4 floz</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6. Simplicity + Express + NIS</td>
<td>6.75 floz + 0.25 oz + 0.5%</td>
<td>0</td>
<td>10</td>
<td>23</td>
<td>76</td>
<td>98</td>
</tr>
<tr>
<td>7. Simplicity + Express + NIS</td>
<td>6.75 floz + 0.5 oz + 0.5%</td>
<td>0</td>
<td>11</td>
<td>30</td>
<td>84</td>
<td>98</td>
</tr>
<tr>
<td>8. Express + MCPA + Axial</td>
<td>0.25 oz + 16 floz + 16.4 floz</td>
<td>0</td>
<td>10</td>
<td>21</td>
<td>74</td>
<td>100</td>
</tr>
<tr>
<td>9. Express + MCPA + Axial</td>
<td>0.5 oz + 16 floz + 16.4 floz</td>
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<td>26</td>
<td>75</td>
<td>99</td>
</tr>
<tr>
<td>10. Untreated</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 5.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Rate/A</th>
<th>4-Dec 7 DAT</th>
<th>11-Dec 14 DAT</th>
<th>18-Dec 21 DAT</th>
<th>8-Jan 41 DAT</th>
<th>15-Jan 48 DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Simplicity + NIS</td>
<td>6.75 floz + 0.5%</td>
<td>0</td>
<td>13</td>
<td>48</td>
<td>74</td>
<td>93</td>
</tr>
<tr>
<td>2. Simplicity + AMS + NIS</td>
<td>6.75 floz + 1.5 lb ai + 0.5%</td>
<td>0</td>
<td>11</td>
<td>49</td>
<td>71</td>
<td>86</td>
</tr>
<tr>
<td>3. Simplicity + COC</td>
<td>6.75 floz + 1.25%</td>
<td>0</td>
<td>13</td>
<td>46</td>
<td>71</td>
<td>86</td>
</tr>
<tr>
<td>4. Osprey + AMS + NIS</td>
<td>4.75 oz + 1.5 lb ai + 0.5%</td>
<td>0</td>
<td>10</td>
<td>45</td>
<td>70</td>
<td>89</td>
</tr>
<tr>
<td>5. Axial</td>
<td>16.4 floz</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6. Simplicity + Express + NIS</td>
<td>6.75 floz + 0.25 oz + 0.5%</td>
<td>0</td>
<td>14</td>
<td>40</td>
<td>65</td>
<td>81</td>
</tr>
<tr>
<td>7. Simplicity + Express + NIS</td>
<td>6.75 floz + 0.5 oz + 0.5%</td>
<td>0</td>
<td>10</td>
<td>38</td>
<td>63</td>
<td>79</td>
</tr>
<tr>
<td>8. Express + MCPA + Axial</td>
<td>0.25 oz + 16 floz + 16.4 floz</td>
<td>0</td>
<td>14</td>
<td>44</td>
<td>71</td>
<td>81</td>
</tr>
<tr>
<td>9. Express + MCPA + Axial</td>
<td>0.5 oz + 16 floz + 16.4 floz</td>
<td>0</td>
<td>13</td>
<td>48</td>
<td>73</td>
<td>89</td>
</tr>
<tr>
<td>10. Untreated</td>
<td>-----</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Italian Ryegrass Herbicide Study in Wheat**

This study was conducted in Visalia, CA on February 14, 2014. Plot sizes were 10' x 25' with 4 replications. Herbicides used in the trial were Express, MCPA, Axial, Simplicity, and Osprey. The application was applied by hand with a CO₂-pressurized backpack sprayer at 30 PSI, with TeeJet 8002 flat fan nozzles, and calibrated to deliver with a spray volume of 15 GPD at 3 mph. Spray height was maintained at 18 to 24 inches above wheat. Wheat was at the 6-8 leaf stage and 6-10 “tall. Weed present at the time of application: Italian ryegrass (*Lolium multiflorum*) (2-4” tall). Evaluations were taken every 7 days after treatment (DAT). Grower sprayed for broadleaves 2-3 weeks prior. Injury was highest with Osprey combinations. Italian ryegrass was poor because applications were made when there was still heavy dew. This was the fault of the researchers.
Table 1.

<table>
<thead>
<tr>
<th>Percent Wheat (Triticum) Injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatments</td>
</tr>
<tr>
<td>1. Simplicity + NIS</td>
</tr>
<tr>
<td>2. Simplicity + AMS + NIS</td>
</tr>
<tr>
<td>3. Simplicity + COC</td>
</tr>
<tr>
<td>4. Osprey + AMS + NIS</td>
</tr>
<tr>
<td>5. Axial</td>
</tr>
<tr>
<td>6. Simplicity + Express + NIS</td>
</tr>
<tr>
<td>7. Simplicity + Express + NIS</td>
</tr>
<tr>
<td>8. Express + MCPA + Axial</td>
</tr>
<tr>
<td>9. Express + MCPA + Axial</td>
</tr>
<tr>
<td>10. Untreated</td>
</tr>
</tbody>
</table>

Broadleaf Control Study in Wheat

This study was conducted in Tulare, CA on November 27, 2013. Plot sizes were 8' x 25' with 4 replications. Herbicides used in the trial were Express, MCPA, Axial, 2,4D, and Clarity. Application was applied by hand with a CO2-pressurized backpack sprayer at 30 PSI, with TeeJet 8002 flat fan nozzles, and calibrated to deliver with a spray volume of 15 GPA at 3 mph. Spray height was maintained at 18 to 24 inches above wheat. Wheat was at the 4-6 leaf stage and 4-7 “tall. Weed present at the time of application: shepherdspurse (Capsella bursa-pastoris) (1-2” tall), common chickweed (Stellaria media) (1-2” diameter), burning nettle (Urtica urens) (1/2-1” tall), and swinecress (Coronopus didymus) (1-2” tall). Evaluations were taken every 7 days after treatment (DAT). All treatments with ET and Shark gave greater injury than the Express treatment. Weed populations and evaluation had considerable variability in this site.

Table 1.

<table>
<thead>
<tr>
<th>Percent Wheat (Triticum) Injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatments</td>
</tr>
<tr>
<td>1. ET + Axial</td>
</tr>
<tr>
<td>2. ET + Express + Axial</td>
</tr>
<tr>
<td>3. ET + Shark + Axial</td>
</tr>
<tr>
<td>4. ET + MCPA + Axial</td>
</tr>
<tr>
<td>5. ET + Prowl H2O + Axial</td>
</tr>
<tr>
<td>6. Shark + Express + Axial</td>
</tr>
<tr>
<td>7. Shark + MCPA + Axial</td>
</tr>
<tr>
<td>8. Shark + Prowl H2O + Axial</td>
</tr>
<tr>
<td>9. Express + Prowl H2O + Axial</td>
</tr>
<tr>
<td>10. Untreated</td>
</tr>
</tbody>
</table>
### Table 2.

Shepherdspurse (*Capsella bursa-pastoris*) Percent Control

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Rate/A</th>
<th>4-Dec</th>
<th>11-Dec</th>
<th>18-Dec</th>
<th>1-Jan</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ET + Axial</td>
<td>1.0 floz + 16.4 floz</td>
<td>45</td>
<td>60</td>
<td>61</td>
<td>63</td>
</tr>
<tr>
<td>2. ET + Express + Axial</td>
<td>0.5 floz + 0.5 oz + 16.4 floz</td>
<td>45</td>
<td>54</td>
<td>59</td>
<td>66</td>
</tr>
<tr>
<td>3. ET + Shark + Axial</td>
<td>0.5 floz + 0.5 oz + 16.4 floz</td>
<td>59</td>
<td>81</td>
<td>85</td>
<td>95</td>
</tr>
<tr>
<td>4. ET + MCPA + Axial</td>
<td>0.5 floz + 16 floz + 16.4 floz</td>
<td>44</td>
<td>69</td>
<td>75</td>
<td>86</td>
</tr>
<tr>
<td>5. ET + Prowl H2O + Axial</td>
<td>0.5 floz + 3 pts + 16.4 floz</td>
<td>46</td>
<td>80</td>
<td>83</td>
<td>87</td>
</tr>
<tr>
<td>6. Shark + Express + Axial</td>
<td>0.5 floz + 0.5 oz + 16.4 floz</td>
<td>56</td>
<td>95</td>
<td>98</td>
<td>100</td>
</tr>
<tr>
<td>7. Shark + MCPA + Axial</td>
<td>0.5 floz + 16 floz + 16.4 floz</td>
<td>73</td>
<td>94</td>
<td>98</td>
<td>100</td>
</tr>
<tr>
<td>8. Shark + Prowl H2O + Axial</td>
<td>0.5 floz + 3 pts + 16.4 floz</td>
<td>56</td>
<td>92</td>
<td>96</td>
<td>99</td>
</tr>
<tr>
<td>9. Express + Prowl H2O + Axial</td>
<td>0.5 floz + 3 pts + 16.4 floz</td>
<td>0</td>
<td>4</td>
<td>51</td>
<td>73</td>
</tr>
<tr>
<td>10. Untreated</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Table 3.

Burning Nettle (*Urtica urens*) Percent Control

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Rate/A</th>
<th>4-Dec</th>
<th>11-Dec</th>
<th>18-Dec</th>
<th>1-Jan</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ET + Axial</td>
<td>1.0 floz + 16.4 floz</td>
<td>80</td>
<td>98</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>2. ET + Express + Axial</td>
<td>0.5 floz + 0.5 oz + 16.4 floz</td>
<td>65</td>
<td>98</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>3. ET + Shark + Axial</td>
<td>0.5 floz + 0.5 oz + 16.4 floz</td>
<td>93</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>4. ET + MCPA + Axial</td>
<td>0.5 floz + 16 floz + 16.4 floz</td>
<td>77</td>
<td>97</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>5. ET + Prowl H2O + Axial</td>
<td>0.5 floz + 3 pts + 16.4 floz</td>
<td>68</td>
<td>99</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>6. Shark + Express + Axial</td>
<td>0.5 floz + 0.5 oz + 16.4 floz</td>
<td>90</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>7. Shark + MCPA + Axial</td>
<td>0.5 floz + 16 floz + 16.4 floz</td>
<td>91</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>8. Shark + Prowl H2O + Axial</td>
<td>0.5 floz + 3 pts + 16.4 floz</td>
<td>90</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>9. Express + Prowl H2O + Axial</td>
<td>0.5 floz + 3 pts + 16.4 floz</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10. Untreated</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Table 4.

Swinecress (*Coronopus didymus*) Percent Control

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Rate/A</th>
<th>4-Dec</th>
<th>11-Dec</th>
<th>18-Dec</th>
<th>1-Jan</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ET + Axial</td>
<td>1.0 floz + 16.4 floz</td>
<td>38</td>
<td>28</td>
<td>40</td>
<td>49</td>
</tr>
<tr>
<td>2. ET + Express + Axial</td>
<td>0.5 floz + 0.5 oz + 16.4 floz</td>
<td>41</td>
<td>56</td>
<td>66</td>
<td>69</td>
</tr>
<tr>
<td>3. ET + Shark + Axial</td>
<td>0.5 floz + 0.5 oz + 16.4 floz</td>
<td>63</td>
<td>76</td>
<td>86</td>
<td>89</td>
</tr>
<tr>
<td>4. ET + MCPA + Axial</td>
<td>0.5 floz + 16 floz + 16.4 floz</td>
<td>43</td>
<td>65</td>
<td>68</td>
<td>73</td>
</tr>
<tr>
<td>5. ET + Prowl H2O + Axial</td>
<td>0.5 floz + 3 pts + 16.4 floz</td>
<td>36</td>
<td>53</td>
<td>55</td>
<td>58</td>
</tr>
<tr>
<td>6. Shark + Express + Axial</td>
<td>0.5 floz + 0.5 oz + 16.4 floz</td>
<td>50</td>
<td>93</td>
<td>98</td>
<td>99</td>
</tr>
<tr>
<td>7. Shark + MCPA + Axial</td>
<td>0.5 floz + 16 floz + 16.4 floz</td>
<td>70</td>
<td>94</td>
<td>96</td>
<td>98</td>
</tr>
<tr>
<td>8. Shark + Prowl H2O + Axial</td>
<td>0.5 floz + 3 pts + 16.4 floz</td>
<td>50</td>
<td>89</td>
<td>93</td>
<td>95</td>
</tr>
<tr>
<td>9. Express + Prowl H2O + Axial</td>
<td>0.5 floz + 3 pts + 16.4 floz</td>
<td>0</td>
<td>4</td>
<td>43</td>
<td>45</td>
</tr>
<tr>
<td>10. Untreated</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Budget:** Funding was used almost entirely for employee labor/benefits with a small amount used for supplies.