Herbicides are chemicals designed to interfere with a plant’s natural physiology. Some herbicides disrupt carotenoid production (clomazone and mesotrione), others form highly energized molecules called ‘free radicals’ by disrupting the electron transport chain (paraquat and diquat). Other herbicides, like the ALS inhibitors (chlorimuron, nicosulfuron, glyphosate), disrupt specific enzyme function. In addition other herbicides can mimic natural growth hormones like the phenoxy acids (2,4-D, MCPA) or the pyridine acids (picloram or clopyralid).

These disruptions and the byproducts produced are what can kill a plant. However we also know that some plants survive herbicide applications. This is referred to as herbicide selectivity. It is this selectivity that makes a herbicide have value or lose value. A herbicide might lose value when there is a difficult weed that needs to be controlled and the herbicide in question does not control this weed. A herbicide has value in the fact that it does not kill the crop.

Plants can survive herbicide applications by many different ways. Leaf structure and surface may inhibit the absorption of the herbicide into the plant. In some cases cuticular waxes on the leaf surface may inhibit the absorption. In other cases it is the physiological differences of a plant’s specific enzyme system that either make a herbicide ineffective or effective. Some plants can metabolize or degrade a herbicide thus also making it inactive.

Timing of herbicide application is very important to maximize activity on weeds and minimize injury potential to crops. Most labels provide application times for two reasons. One is that the labeled herbicide does in fact have some slight activity on the crop. An example of this is the use of 2,4-D as a burndown before soybeans. If 1 pt/A is used you must wait 7 days before planting, if 2 pt/A is used the wait is 30 days before planting. This time interval is to assure that the herbicide has dissipated to safe levels before the susceptible soybean is planted. The second reason is that when the physiology of a crop plant changes, as it does when reproduction starts, the crop may be more susceptible to the herbicide and thus cause damage that can end up in yield effects.

The following are quick reference charts of the labeled application timing for several herbicides used in corn, soybean, and wheat. The herbicide name is on the left axis and the crop height and growth stage is on the bottom.
| Corn | **Accent** | **Accent Gold** | **Aim** | **Atrazine** | **Balance Pro** | **Basagran** | **Basis** | **Basis Gold** | **Beacon** | **Bicep II Magnum** | **Buctril / Moxy 2E** | **Bullet** | **Callisto** | **Clarity** | **Connect** | **Define** | **Degree** | **Degree Xtra** | **Distinct** | **Dual II Magnum** | **Epic** | **Exceed** | **Field Master** | **FullTime** | **Glyphomax Plus** | **Gramoxone Max** | **Guardsman Max** | **Harness / Surpass** | **Harness Extra** | **Hornet WDG** | **Lasso / Micro-Tech** | **Leadoff** | **Liberty** | **Liberty ATZ** | **Lighting** | **Lumax** | **Marksman** | **Mirage** | **NorthStar** | **Option** | **Outlook** | **Pendimax** | **Princep 4L** | **Prowl 3.3 EC** | **Python** | **Ready Master ATZ** | **Resource** | **Roundup WeatherMax** | **Shotgun** | **Spirit** | **Steadfast** | **Stinger** | **Touchdown** | **Weedar 64** | **Yukon** |
|-------|-------------|----------------|--------|-------------|----------------|-------------|----------|--------------|----------|----------------|----------------|-------------|-------------|-----------|--------|----------|--------|--------|----------|--------|-------------|--------|-------------|-------------|---------------|-------------|-----------|----------------|-------------|-------------|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|       | **Accent Gold** | **Aim** | **Atrazine** | **Balance Pro** | **Basagran** | **Basis** | **Basis Gold** | **Beacon** | **Bicep II Magnum** | **Buctril / Moxy 2E** | **Bullet** | **Callisto** | **Clarity** | **Connect** | **Define** | **Degree** | **Degree Xtra** | **Distinct** | **Dual II Magnum** | **Epic** | **Exceed** | **Field Master** | **FullTime** | **Glyphomax Plus** | **Gramoxone Max** | **Guardsman Max** | **Harness / Surpass** | **Harness Extra** | **Hornet WDG** | **Lasso / Micro-Tech** | **Leadoff** | **Liberty** | **Liberty ATZ** | **Lighting** | **Lumax** | **Marksman** | **Mirage** | **NorthStar** | **Option** | **Outlook** | **Pendimax** | **Princep 4L** | **Prowl 3.3 EC** | **Python** | **Ready Master ATZ** | **Resource** | **Roundup WeatherMax** | **Shotgun** | **Spirit** | **Steadfast** | **Stinger** | **Touchdown** | **Weedar 64** | **Yukon** |
**Soybean**

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- **DBP** = days up to planting
- **DBH** = days before harvest from last application
- **DAP** = days after plant but before emergence
- **<>** = before or less than
- **a** = with a planned POST application
- **b** =
- ***** = see supplemental label

---

### POST application timing not specified on label

- **Aim**
- **Assure II**
- **Authority**
- **Backdraft SL**
- **Basagran**
- **Canopy XL**
- **Classic**
- **Cobra**
- **Command 3 ML**
- **Command Xtra**
- **Domain**
- **Dual II Magnum**
- **Extreme**
- **FirstRate**
- **FlexStar**
- **Fusilade DX**
- **Fusion**
- **Gauntlet**
- **Glyphomax Plus**
- **Gramoxone Extra**
- **Harmony GT**
- **Lasso**
- **Mirage**
- **Outlook**
- **Pendimax/Prowl**
- **Poast Plus**
- **Pursuit DG**
- **Pursuit Plus EC**
- **Python**
- **Raptor**
- **Resource**
- **Roundup WeatherMax**
- **Scepter 70 DG**
- **Select**
- **Sencor**
- **Squadron**
- **Synchrony STS**
- **Touchdown IQ**
- **Treflan**
- **Ultra Blazer**
- **Valor**

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**Aim**

**Assure II**

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### Wheat

<table>
<thead>
<tr>
<th>Stage Description</th>
<th>Pesticides</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 6 stage</td>
<td>Achieve, Aim, Banvel/Clarity/Sterling, Bonate, Buctril, Harmony Extra, Harmony GT, Hoelon, Maverick, MCPA, Peak, Sencor, 2,4-D</td>
</tr>
<tr>
<td>30 DBP to joint stage</td>
<td></td>
</tr>
<tr>
<td>Anytime before to joint (fall seed)</td>
<td></td>
</tr>
<tr>
<td>Anytime before 6 leaf stage (spring seed)</td>
<td></td>
</tr>
<tr>
<td>from 3 leaf stage to before boot emergence to boot</td>
<td></td>
</tr>
<tr>
<td>after 2 leaf stage, but before flag leaf</td>
<td></td>
</tr>
<tr>
<td>after 2 leaf, but before flag leaf</td>
<td></td>
</tr>
<tr>
<td>before planting but not after 77 DBH</td>
<td></td>
</tr>
<tr>
<td>after drilling wheat emerges, prior to jointing</td>
<td></td>
</tr>
<tr>
<td>after tillered but before boot stage (fall seeded)</td>
<td></td>
</tr>
<tr>
<td>from emergence but before 2nd node</td>
<td></td>
</tr>
<tr>
<td>2 leaf to 2 tiller</td>
<td></td>
</tr>
<tr>
<td>3 to 4 tiller</td>
<td></td>
</tr>
<tr>
<td>over 4 tiller</td>
<td>see label for rate recommendations</td>
</tr>
<tr>
<td>tillered up to jointing</td>
<td></td>
</tr>
<tr>
<td><strong>NOTE:</strong> wheat injury can sometime occur when application are made during labeled application timings. Injury can also occur during times of poor growth with a herbicide application. Reading labels will notify you of any possible risks. Always read and follow pesticide labels.</td>
<td></td>
</tr>
</tbody>
</table>