These chemicals control germinating seed. The seed germinates and then dies. Preemergence controls will work on annuals and perennials. The compounds must be in place before germination of the seed. The timing for the application of preemergence chemicals depends on the target plants.

I. Preemergence Control of Annual Grasses and Small-Seeded Dicots  
   a. speaks to timing of application not action of herbicide  
   b. How do preemergence herbicides work?  
      i.  
      ii.  
      iii.  
      iv.  

   1. 

c. Generalities  
   i. Irrigate after application  
   ii. Low water solubility  
   iii. High sorption coefficient (K_{oc})  
   iv. Long field half-life  
   v. Some herbicides are prone to volatilization  
   vi. Avoid application near time of turf establishment  

d. products available  
   i.  
      1. Benefin (Balan)  
      2. Benefin + oryzalin (XL)  
      3. Benefin + trifluralin (Team)  
      4. Oryzalin (Surflan)  
      5. Pendimethalin (Pendulum, Pre-M, Weedgrass Control)  
      6. Prodimine (Barricade)  

   ii.  
      1. Inhibits mitosis  
      2. Labeled for putting greens
iii.
1. Inhibits mitosis
2. Pre and early Post (1-3 leaf)
3. Safe on most all major cool- and warm-season grasses
4. Labeled for putting greens

iv.
1. Inhibits chlorophyll biosynthesis
2. Good activity on goosegrass
3. Not for use on putting greens or home lawns

v.
1. Inhibits mitosis
2. Post activity on Veronica filiformis (Creeping speedwell) – when flowering

vi.
1. Inhibits root growth
2. Safe on newly established cool season turf

e. Turfgrass tolerance – not all labeled for all species or situations
i. labeled and fairly safe on all cool season grasses –

ii. may injure fine fescue and creeping bentgrass –

iii. greens –

iv. bent fairways –
v. no tees or greens –

vi. not on bent –

f. Soil residual
   i. formulations: sprayable vs. granular
      sprayables offer better coverage, granulars are more convenient
      but can vary in size and consistency.

Do not use a spreader sticker when applying a preemergence herbicide, the
chemical does not need to adhere to the plant, it should be on the soil surface

**PREEMERGENCE PERSISTENCE**

<table>
<thead>
<tr>
<th>HERBICIDE</th>
<th>$T_{1/2}$ (days)</th>
<th>OBSERVED LIFE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefin</td>
<td>40</td>
<td>short</td>
</tr>
<tr>
<td>Bensulide</td>
<td>120</td>
<td>medium</td>
</tr>
<tr>
<td>Pendimethalin</td>
<td>90</td>
<td>medium-long</td>
</tr>
<tr>
<td>DCPA</td>
<td>100</td>
<td>medium-long</td>
</tr>
<tr>
<td>Siduron</td>
<td>90</td>
<td>very short</td>
</tr>
<tr>
<td>Oxadiazon</td>
<td>60</td>
<td>long</td>
</tr>
<tr>
<td>Dithiopyr</td>
<td></td>
<td>very long</td>
</tr>
<tr>
<td>Prodiameine</td>
<td>60</td>
<td>very long</td>
</tr>
<tr>
<td>Atrazine</td>
<td></td>
<td>--</td>
</tr>
<tr>
<td>Metolachlor</td>
<td>90</td>
<td>--</td>
</tr>
</tbody>
</table>

iii. half-life important to determine residual, other factor influence
longevity: soil moisture, soil temperature, soil type, turf density
iv. loss of control due to

repeat application—failure not due to herbicide but to breaks in barrier, booster shot recommended six to eight weeks after first application to provide season long control

I. Preemergence annual grass control
TARGET: Summer Annual Grasses
• General characteristics of SA grasses

•

•

•
When to apply PRE for goosegrass control?
1. Environmental timing –

2. Soil Temperature –

Goose grass tolerates putting green mowing height and is very competitive in compacted soils.

II. **Best control is achieved with preemergence herbicides**
   a. annual bluegrass, crabgrass, goosegrass
      *crabgrass* and *goosegrass* are summer annuals
   b. timing, when to apply: spring
      i. environmental-

      ii. soil temperature –

      iii. spring –

      iv. spring split –
v. fall –

vi. fall/spring split –

III. Preemergence broadleaf herbicides
   a.
      i.
      ii.
      iii.

controls or suppresses 51 common weeds. Of those, 25 are common turf weeds.

<table>
<thead>
<tr>
<th>Control</th>
<th>suppress</th>
</tr>
</thead>
<tbody>
<tr>
<td>chickweeds</td>
<td>plantains</td>
</tr>
<tr>
<td>knotweed</td>
<td>henbit</td>
</tr>
<tr>
<td>speedwell</td>
<td>shepherd’s purse</td>
</tr>
<tr>
<td>woodsonrel</td>
<td></td>
</tr>
<tr>
<td></td>
<td>annual bluegrass</td>
</tr>
<tr>
<td></td>
<td>crabgrass</td>
</tr>
<tr>
<td></td>
<td>dandelion</td>
</tr>
<tr>
<td></td>
<td>goosegrass</td>
</tr>
</tbody>
</table>

iv.

b. grass preemergence herbicides with limited broadleaf activity
   DCPA         | spurge           |
   pendimethalin| spurge and oxalis|
   dithiopyr   | purslane, oxalis, speedwell, chickweed, spurge |
   Team        | suppress spurge and oxalis |