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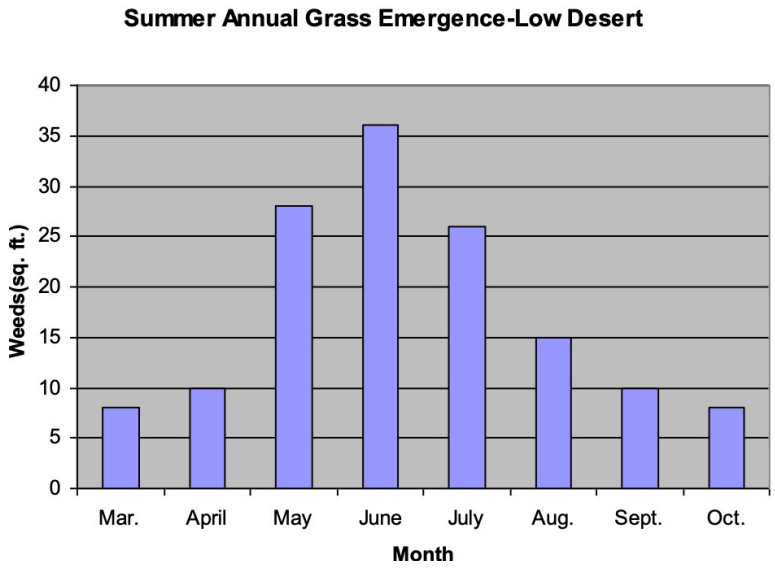
Preemergence Herbicides

How do preemergent herbicides work?
These herbicides are sprayed on soil surface to protect the crop from germinating weeds. The weeds are killed before or right after they emerge. The use of Preemergent herbicides involves probably more precision than the postemergence herbicides. They must be in the right area at the right concentration to kill the weeds. Most have to be absorbed by roots and shoots and others work better or worse under specific conditions such as moisture content, organic matter. We have seen that when increasing the depth of incorporation of control the weed control decreased, due to a dilution effect. Additionally, another factor to consider is that weed control declines over time.
A research reports shows **Prowl** controlled better *S. halepense* under the low crop residue level. **Pursuit** efficacy for *S. spinosa* and *A. theophrasti* was better under high crop residue level. **Sencor** and **Command** provided the best weed control in this evaluation for all residue levels. Some preemergent herbicides like **Kerb**, are absorbed and translocated throughout the plant while others like **Treflan** or **Prefar** do not move into the plant and only work at the root tips.

The chart below shows that **summer weeds** started germination in March, reached a peak in June and continued to through October. This shows that Pre-emergence herbicides must be applied, if possible starting late February and additional applications may be needed if allowed by the label Like our UA weed scientist Barry Tickes always say: "It is better to be a month early than a minute late".



References

1. Knake, E., Appleby, A., & Furtick, W. (1967). Soil Incorporation and Site of Uptake of Preemergence Herbicides. Weeds, 15(3), 228-232. doi:10.2307/4041210

2. James E. Altland (2019) Efficacy of preemergence herbicides over time Journal of Environmental Horticulture (2019) 37 (2): 55–62. https://doi.org/10.24266/0738-2898-37.2.55

3. Pedro Henrique Urach FerreiraORCID Icon,J. Connor FergusonORCID Icon,Daniel B. ReynoldsORCID Icon,Greg R. KrugerORCID Icon & Jon Trenton Irby (2021) Crop residue and rainfall timing effect on pre-emergence herbicides efficacy using different spray nozzle types

Using preemergent herbicides correctly to kill weeds before or soon after they emerge is often more complicated and difficult than using postemergent herbicides. Most preemergent herbicides do not kill weed seeds. They only work on weed seeds that have germinated and they must be in the right place at the right time and at high enough concentrations or failure or partial control can result. Weed seeds are killed by some products such as the fumigants chloropicrin, metam sodium and Telone and by soil solarization and flooding. Most preemergent herbicides only work once they have been absorbed by roots and shoots of germinated seeds. Herbicides like Goal or Chateau are absorbed at the soil surface as the shoot emerges. Others are absorbed only by at the root tips as they grow into the treated soil. The location of the herbicide is critical. Roots or shoots that are already well established before they contact the herbicide often survive. Roots that have grown past the herbicide and still have vigor, will also often recover. Some herbicides such as Kerb(pronamide), are absorbed and translocated throughout the plant while others like trifluralin(treflan) or bensulide(Prefar) do not move into the plant and only work at the root tips.

It is not too early to consider applying herbicides for summer annual grasses. Preemergence herbicides are available and effective for us in many summer annual crops. They are only effective however when applied before weeds emerge and it is better to be a month early than a minute late. The graph above is based on a trial we did in Yuma several years to determine when summer annual grasses emerge. Weeds seed germination varies by species and will be affected by temperature, soil type, depth in the soil and other factors. This chart is a general guideline. Summer weeds began to germinate in March, reached a peak in June but continued to germinate through October. Pre-emergence herbicides should be applied, when possible, starting in late February and may need to be reapplied in June or July. The herbicide label should be checked to see what is allowed.

Do Not Wait for Your Preemergent Herbicides

it is necessary to kill as many weeds as possible prior to planting.

As depth of incorporation of most herbicides was increased, control of green foxtail decreased, indicating a dilution effect.

1. Knake, E., Appleby, A., & Furtick, W. (1967). Soil Incorporation and Site of Uptake of Preemergence Herbicides. Weeds, 15(3), 228-232. doi:10.2307/4041210

Preemergence herbicides are applied to container-grown nursery crops repeatedly throughout the year, often in 8 to 10 week intervals. Preemergence herbicide efficacy may decline over time, resulting in reduced weed control several weeks after application if weed seed density remains high. The objective of this research is to evaluate efficacy of

preemergence herbicides on creeping woodsorrel (*Oxalis corniculata* L.) and flexuous bittercress (*Cardamine flexuosa* With.) by applying weed seed from 0 to 10 weeks after herbicide application.

2. James E. Altland (2019) Efficacy of preemergence herbicides over time
Journal of Environmental Horticulture (2019) 37 (2): 55–62.
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Pendimethalin better controlled *S. halepense* under the low residue level. Imazethapyr efficacy for *S. spinosa* and *A. theophrasti* increased under high residue level.

3. Pedro Henrique Urach FerreiraORCID Icon,J. Connor FergusonORCID Icon,Daniel B. ReynoldsORCID Icon,Greg R. KrugerORCID Icon & Jon Trenton Irby (2021) Crop residue and rainfall timing effect on pre-emergence herbicides efficacy using different spray nozzle types
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