

Alternatives for Glyphosate in Nursery Production

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Summary

Glyphosate is widely used in nursery practice. The advantage to Glyphosate is that it is translocated in plants and therefore effective against root weeds, large weeds and overwintering rosettes. In addition, it works in unfavourable weather. In Germany, the most commonly used products (e.g., Durano TF, GlyfosTF Classic) contain 360 g/l glyphosate and TF formulation. There is lots of experience regarding tolerance.

On the contrary, glyphosate is the active ingredient with the world's largest tonnage and it is politically and socially controversial. In Germany it will be banned after January 1st, 2024.

VuB (Versuchs- und Beratungsring Baumschulen e.V.) carried out multiple trials to look for alternative methods:

Autumn seed beds: A change of strategy is necessary to control weed growth, especially the formation of rosettes (shepherd's purse and chamomile). After sowing seeds, weeds have to be prevented in autumn by application of soil herbicides. Depending on tolerance, the following herbicides can be used: Goltix Gold (metamitron), Boxer (prosulfocarb), Spectrum (dimethenamid-P), Stomp Aqua (Pendimethalin), Proman (metobromuron) or Quickdown (pyraflufen) + Toil, all with reduced application rates. Shortly before emergence follow-up treatments with herbicides based on pelargonic acid plus grass herbicides or thermal treatment can be made. In the spring, residual herbicides should only be used if the tolerance is known.

Transplant beds: Glyphosate with reduced rates is sometimes used in autumn to clean weedy conifer beds. This practice is not recommended but can in some cases be used as an “emergency procedure”. In trials the herbicide Kerb Flo (a.i. propyzamid) was combined with different partners. VuB looked at efficacy and crop tolerance. Phytotoxicity occurred. Herbicides based on pelargonic acid or pyraflufen scorched needles of conifers (*Abies* and *Picea*).

After the use of MaisTer Power (iodosulfuron, foramsulfuron and thien-carbazone) the plants showed yellow needles and a delay in sprouting.

Other combinations like Kerb Flo + Artist (flufenacet and metribuzin) or + Lenta-gran (pyridat) or + reduced rates of Broadway (florasulam, pyroxsulam) were applied without inflicting damage to the plants. Also, in transplant beds a change of strategy is needed. It has to be a priority to prevent weed growth after planting with residual herbicides. An early treatment with herbicides based on propyzamide + partner is better than a treatment in the late spring.

Directed spraying: A large trial in *Thuja* with 12 treatments and three replicates was presented.

Combinations of herbicides were used against broadleaf weeds and grasses. Some showed quick effects, but with regrowth (e.g. pelargonic acid or pyraflufen in combination with grass herbicide). Good

effects on the weeds could be achieved with a combination of Cato (rimsulfuron) and Broadway or with MaisTer Power. The efficacy depended upon weed species. Phytotoxicity did not occur. The larger the trees, the easier it is to find a replacement for glyphosate treatments.

Conclusion

There is no 1:1 replacement for products containing the active ingredient glyphosate. For every intended use the right application has to be found.

Root weeds (couch grass, thistle) should be controlled as long as glyphosate is still permitted. Familiarize yourself with alternatives in good time. Act more preventively in the future, don't let weeds grow large. Right timing is becoming more important. Mechanical and thermal measures should be used where possible.

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