Soil Fumigant Options for the Australian Turf Production Market

INDIGO SPECIALTY

For turf producers, weed contamination remains one of the most persistent and costly challenges. Unlike end-use turf situations, where minor contamination may be tolerated, turf farms operate under tight quality standards where even low levels of off-type grasses or weeds can render turf unmarketable.

Over successive harvest cycles, weed seedbanks accumulate in the soil, particularly from species such as winter grass (Poa annua), summer grass, crowsfoot, and sedges. Once established, these species are difficult to remove selectively without damaging the crop.

For this reason, soil fumigation plays a critical role in weed seedbank management, particularly prior to replanting or when transitioning between turf varieties. It provides a reliable method of reducing weed pressure across the entire soil profile, enabling clean establishment and maintaining varietal purity.

Why fumigation is critical for weed control in turf production

1. Seedbank reduction

The primary value of fumigation in turf production is its ability to significantly reduce the viable weed seedbank in the soil. Unlike post-emergent herbicides, which target actively growing weeds, fumigants act on germinating seeds and emerging seedlings, reducing future weed pressure.

This is particularly important in high-intensity turf systems, where repeated cropping cycles can provide a window for weed populations to build.

2. Whole-profile control

Fumigants move through the soil as gases, allowing them to act throughout the entire growing medium, rather than just at the surface. This is critical for controlling deeply buried weed seeds, rhizomes and vegetative propagules, and weed flushes that occur after irrigation or rainfall.

3. Clean start for high-value turf

Turf consumers expect uniform, contaminant-free turf. Even minor weed contamination can lead to rejection or reduced value. Fumigation ensures a clean establishment phase, allowing the desired turf species to dominate without early competition. This is particularly important for slower establishing varieties, where early weed pressure can significantly impact coverage and uniformity.

Fumigation and turf variety changeovers

One of the most important, but often underestimated uses of fumigation in turf production is during variety transitions.

As the industry shifts toward improved turf varieties (e.g. hybrid couches, improved zoysia or buffalo lines) producers must ensure that previous turf species and off-types are completely removed before replanting.

Why this matters

- Contamination from previous varieties can persist through stolons, rhizomes, or seed
- For licensed or premium turf varieties, maintaining genetic purity is critical. Fumigation helps ensure compliance with quality assurance standards
- Mixed swards reduce visual uniformity, texture consistency, and performance. Even small amounts of contamination can compromise market acceptance
- By removing competition, fumigation allows new varieties to establish faster and more uniformly, reducing time to harvest

Fumigation provides the only reliable method of achieving a true species reset,

particularly where previous turf has been grown for multiple cycles.

Key fumigant options for weed-focused programs

Metham sodium remains a key soil fumigant in agriculture in Australia. Applied as a liquid, it rapidly converts in moist soil to methyl isothiocyanate (MITC), a volatile compound that diffuses through the soil profile and delivers broad-spectrum weed and pest control.

Role in turf systems

Metham sodium is registered and commonly used in turf production where multiple weed and pest pressures exist. It is particularly valuable in situations requiring simultaneous suppression of weed seeds, nematodes, and fungal pathogens.

Key benefits

- Broad-spectrum efficacy, controlling a wide range of soil weeds and pests in a single operation
- Flexible application techniques
- Proven cost-effectiveness for large-scale turf operations
- Rapid breakdown in soil, reducing long-term residue concerns

Limitations

- Performance is very dependent on soil moisture, temperature, and sealing
- Risk of vapour drift if not correctly applied and contained
- Requires careful site preparation and operator expertise

In practice, metham sodium is best suited to situations where a full soil reset is required prior to turf establishment and experienced operators are on hand to apply the product correctly and safely.

Dazomet provides similar pest control to metham sodium but in a convenient granular formulation. Once incorporated into moist soil, it decomposes to release MITC gas, delivering fumigation activity throughout the treated zone.

Role in turf systems

Dazomet is particularly suited to turf managers seeking a simpler, non-injection-based fumigation approach. It is widely used in turf production throughout Australia and is available via Indigo Specialty as the brand ProForce Miticor 980G.

Key benefits

- Ease of handling and application, with no need for specialised application equipment
- Improved application uniformity when evenly spread and incorporated correctly
- Reduced operator exposure risk compared with liquid fumigants
- Effective against fungi, nematodes, weeds, and insects

Limitations

- Requires thorough incorporation and irrigation to activate
- Slightly slower release of fumigant gas compared with liquid formulations

Dazomet is often considered the most practical fumigant for turf operations lacking specialised fumigation equipment, while still delivering strong multi-pest control of weeds, diseases, pests and nematodes.

EPTC (S-Ethyl dipropylthiocarbamate), also known as Eptam is a thiocarbamate compound with volatile properties that allow it to act within the soil vapour phase. While not a true broad-spectrum fumigant in the traditional sense, it plays an important role in targeted weed management during soil preparation.

Fumigant Type	Formulation	Key Strengths	Spectrum of Control	Volatility	Typical Waiting Period*
Metham sodium	Liquid	Broad-spectrum, flexible application rates	Weeds, nematodes, fungi, some insects	High (gas-forming MITC)	14–21 days
Dazomet	Granular	Broad spectrum, Ease of use, reduced drift	Weeds, nematodes, fungi, insects	Moderate (MITC release)	10–21 days
EPTC	Liquid	Weed seedbank control only	Primarily weeds (grasses, sedges)	High (requires sealing)	7–14 days
EDN	Gas	Rapid action, very low persistence	Nematodes, fungi, weeds	Very high (gas)	5–10 days

*Waiting periods indicative only and vary with soil temperature, moisture, rate and label requirements. Consult and follow label directions.

Role in turf systems

EPTC is most effective where weed seedbanks, particularly annual grasses and seed viable sedges (Mullumbimby Couch) are the primary constraint to turf establishment. It is typically incorporated into the soil prior to planting as part of a broader weed management strategy.

Key benefits

- Highly effective on germinating weed seeds and seedlings, especially grassy weeds
- Can be mechanically incorporated, aligning with standard cultivation practices
- Provides a targeted solution where weed pressure dominates

Limitations

- Limited activity on nematodes and soil-borne pathogens
- Requires immediate incorporation to minimise volatilisation losses
- Not suitable as a standalone solution where multiple pest groups are present

EPTC is best viewed as a specialist tool, complementing broader fumigation programs rather than replacing them.

Ethanedinitrile (EDN) represents a newer generation fumigant, gaining attention globally as a potential alternative to older chemistries. It is a gaseous fumigant with rapid diffusion and breakdown characteristics. EDN is well suited to high-value turf construction projects, such as elite sportsfields and golf greens, where rapid turnaround and minimal residue are critical.

Key benefits

- Fast-acting fumigation, enabling shorter plant-back intervals
- Broad-spectrum activity against weed seeds, nematodes and pathogens
- Breaks down into naturally occurring nitrogen-based compounds

Limitations

- Requires specialised gas handling and application systems
- Limited commercial availability and operator familiarity

EDN is likely to play an increasing role as the industry moves toward lower-emission, high-efficiency fumigation systems.

Practical considerations for weed control success

Soil preparation

Effective weed control depends heavily on soil preparation. A fine, moist, and uniform soil profile ensures even distribution of fumigant gases. Poor preparation can lead to patchy weed control and uneven turf establishment.

Timing

Fumigation should be timed to coincide with optimal soil temperature and moisture, promoting gas movement and seed germination activity. This increases exposure of weed seeds to the fumigant.

Sealing and retention

Sealing the soil surface, through rolling or irrigation is critical for retaining fumigant gases. Without proper sealing, fumigant loss reduces weed and pest control efficacy and increases environmental risk.

Conclusion

For turf producers, weed control is not just a maintenance issue, it is a core determinant of product quality and profitability. Soil fumigation provides a powerful tool for reducing weed infestations, enabling clean establishment, and supporting successful transitions between turf varieties.

Whether using metham sodium, dazomet, EPTC, or emerging options like EDN, the key to success lies in understanding their role within the broader production system. When applied strategically, fumigation delivers a true reset of the soil profile, allowing producers to maintain high standards of turf purity, uniformity, and market value.