White Italian snail

*Theba pisana*

Summary:

White Italian snails are an important pest of crops and pastures across southern Australia and may feed on young crop and pasture plants, particularly those grown on calcareous and highly alkaline soils. They are considered a serious pest because they contaminate grain during harvest and can clog and damage harvest machinery.

Occurrence:

An introduced snail in 1928 from the Mediterranean region of Europe, the white Italian snail is found in coastal areas of South Australia, Victoria, New South Wales, Tasmania and Western Australia.

White Italian snails are an important pest on calcareous soils where conservation farming is practiced.

Description:

Mature white Italian snails have shells 10-30 mm in diameter. The coiled, white shell usually has a broken brown band around the spiral, although some lack this banding and are entirely white. The umbilicus (hole in the centre of the shell) is semi-circular and partly closed. Under magnification cross-hatched scratches are visible on the shell.

White Italian snail showing half closed umbilicus (Source: SARDI)
Lifecycle:

As snails are hermaphrodites each snail has both male and female reproductive organs. Therefore every snail has the potential to lay eggs after mating. Snails lay hundreds of eggs each season and if conditions are favourable, numbers can increase rapidly. Soil moisture content determines when egg laying begins. The snails over-summer (aestivate) on stubble, fence posts, weeds and other vegetation to avoid the high soil surface temperatures of summer. Moisture, either from heavy dews or rainfall, will trigger snails to become active and descend to the soil surface. Autumn moisture also encourages snails to become more active on the soil surface. It appears autumn rainfall triggers mating, then feeding if moisture persists. If the soil remains moist, egg laying can commence two weeks after mating. Most egg laying occurs in autumn or early winter although some laying continues to early spring. Eggs hatch after about 2-3 weeks. After steady growth through winter and spring the snails aestivate through the following summer. Increased autumn rainfall is the best indicator of increased spring populations. Italian snails can have either an annual or biennial lifecycle. They feed on green plant and dead organic material.

Snails are, nonetheless, opportunistic breeders. Previous wet summers have indicated that, when conditions are suitable, breeding can occur in summer.

Similar to:

These snails can be confused with the vineyard or common white snail but can be separated by the difference in the umbilicus. White Italian snails have an umbilicus that is half closed off while the vineyard or common white snail has an umbilicus that is circular.
Crops attacked:

All field crops including wheat, barley, oats, field peas, faba beans, canola as well as pastures. Emerging plants are particularly at risk. Barley, canola and pulses are most susceptible. The importance of white Italian snails as a pest, as with other species, is because they contaminate grain during harvest while also cogging and damaging harvest machinery.

Damage:

As well as feeding on organic matter on the soil surface, Italian snails feed on green plant material so attack emerging and young plants of crops and pastures. Typical damage includes shredded leaves, by the snail’s rasping mouthpart, often defoliating plants. In extreme circumstances loss of green leaf area leads to plants not being able to absorb foliar applied trace elements, resulting in substantial yield loss. In some areas, there is also evidence that the snail may impact native flora and grasslands.
Monitoring:

Monitoring for white Italian snails should be carried out throughout the year, particularly from paddock edges, to allow for the use of all management options and to assess effectiveness of controls. Use a 0.1m² quadrat (approx. square foot) and count all the live snails within the quadrat. Separate the round from any conical snails. Divide the round snails into those larger 7mm diameter and those smaller than 7mm as the smaller are unlikely to be controlled by baiting. Samples should be taken at approx. 10m spacings along transects in key paddock areas.

Key monitoring times are:

- To assess for stubble management – January-February
- For burning and/or baiting options – March-April
- Baiting options, particularly along fence lines – May-August
- To assess for header modifications – 3-4 weeks prior to harvest

The importance of monitoring for feeding activity cannot be over emphasised.
Economic thresholds:
The use of thresholds for snails is not relevant as good snail management requires population reduction at every opportunity.

Management options:

Biological:
There is some predation of white Italian snails by birds and lizards but this does not give significant control.

Cultural:
There are several cultural control options. These appear in detail in, *Bash’Em Burn’Em Bait’Em – Integrated snail management in crops and pastures*. In summary there are two approaches to cultural control.

- *Bash’Em*. As snails over-summer on any object above the soil surface to escape summer soil temperatures, stubble management by cabling, rolling or slashing is designed to bring the snails to the soil surface where they desiccate and die. The higher the temperature when these processes are carried out, the more likely that snails will die. For effectiveness, air temperatures should be above 35°C. Snail numbers can be reduced by as much as 50% to 90% through using stubble management.

- *Burn’Em*. This is the most effective method of snail control pre-breeding. An even burn is most effective. As snails are often beneath rocks, these should be turned before burning, and summer weeds should be browned-off. While burning stubble is seen as advantageous in destroying weed seeds, stubble-harbouring diseases and snails, it is also detrimental in that it destroys beneficial soil organisms and reduces organic matter. An even burn may reduce snail numbers by up to 80-100%, while a patchy burn may still achieve a kill of 50-80%. **Burn only when fire restrictions permit.**

Stubble management through burning, cabling, rolling and slashing involve the potential risk of increasing soil erosion.

White Italian snails use summer weeds as sites for aestivation. Green summer weeds can reduce the effectiveness of burning, since up to 40% of snails can survive where green plant material offers them protection. Control summer weeds especially along fences and paddock borders.

Snails have been found along all major transport routes between South and Western Australia, especially in camping grounds and at intersections along these roads. This suggests snails have become proficient hitch-hikers and are moving between regions on transport.

To avoid moving snails from infested to clean areas, farm machinery and produce such as hay should be inspected and if necessary cleaned of snails.

Chemical:
Commercial snail baits are available for snail control. Choice of bait is dependent on which products are registered for use in your state. Consult the product label. Label rates must be adhered to.

- Timing of application is critical for success and is dependent on snail feeding.
- Control weeds that offer a refuge for snails before baiting.
Commence baiting following rain or heavy dews in March as snails may not always feed after summer rain.

- Baiting before seeding is more effective as the bait will be the only food available.
- Ensure baits are spread evenly.
- Trials have shown that if using a fertilizer spreader, baits can only be spread 18-24 metres and it is important to ensure total coverage.
- Monitor snail numbers across the paddock and adjust bait rates accordingly.
- Bran based baits need to be applied regularly, at least every two weeks. More expensive extruded products last up to a month.
- After spreading bait, check the spread and the amount of bait used. This will indicate if follow-up baiting is required.
- Follow-up moisture may cause egg laying to begin within 2 weeks and it is essential to apply bait before this occurs.

Controlling snails before egg laying is essential.

Fence line and border baiting can be effective following autumn rainfall. At this time snails will be moving from aestivation sites to the soil surface.

Acknowledgements:

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References/Further Reading:


Bellati J, Mangano P, Umina P and Henry K. 2010. I SPY. Insects of Southern Australian Broadacre Farming Systems Identification Manual and Education Resource. Department of Primary Industries and Resources South Australia (PIRSA) and the Department of Agriculture and Food Western Australia (DAFWA).
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