Management to minimise white snails

Snail Monitoring Project
Dr Suzanne Charwart, South Australian Research and Development
http://www.sardi.sa.gov.au/crops/entomolo/entomolo.htm

SUMMARY

Snails are increasingly becoming a pest across Victorian cropping districts. Understanding snail types and numbers and applying the appropriate management strategy when snail numbers are low should prevent a population explosion occurring. Working with 60 farmers, counts were carried out in three districts in South Australia to measure the effectiveness of different types of management on snail control.

BACKGROUND

Snail numbers are increasing and silo receival standards have been tightened. There is an increased requirement for a greater understanding and application of snail management practices.

TREATMENTS

Snail numbers were monitored before the following management treatments were applied and seven days after the treatment:

- Stubble rolling/slashing/cabling or grazing
- Stubble burning
- Broadacre and fence line baiting.

Snail numbers were also monitored at seeding to establish baiting requirements and pre-harvest to establish the need for harvester modifications or windrowing.

RESULTS

Stubble management gave good initial snail control. Without further management, the benefits from stubble management were lost between March and June when populations began to build-up. Increases in snail numbers during this period could have been due to invasion and/or hatching of the first juveniles.

Even though many no-till farmers and farmers on fragile soils with low organic matter reject burning, it is one of the most successful methods to reduce high snail numbers in cereal stubble and pastures.

Burning reduced white snail numbers between 40% and 100% and provided good control in situations with high initial snail numbers. Burning is less effective against conical snails, which can hide in the ground or shelter under rocks.

Baiting at seeding, crop establishment and in the early growth stages of crops achieved satisfactory levels of snail control. However, several farmers recorded up to eight-fold increases in snail numbers between their after-baiting counts in July/August and their pre-harvest counts in November. This increase in snail numbers was due to the recruitment of hatchlings from earlier breeding.

Baiting in late September - early October was not effective against the juvenile (smaller than 7mm) component of populations. This left many farmers with only limited control options two months prior to harvest.

Windrowing was used where round snails in barley were of concern and machinery settings and sieves were optimised to reduce snail numbers in other crops. However, juvenile round and conical snails in barley, canola and lentils again provided an unsolvable problem.

The level of snail control with stubble management

Date of pre and post counts	Crop	White snails/m^2		Conical snails/m^2		*Stubble Management	Region
		pre	post (% reduction)	pre	post (% reduction)		
18/1 & 9/2	Medic	371	42 (88)	362	71 (80)	TR twice	YP
16/2 & 24/2	Wheat stubble	86	64 (25)			TR at 35°C	YP
14/2 & 25/2	Wheat stubble	74	30 (59)			SR	YP
16/3 & 29/3	Barley stubble	57	20 (60)			TR	SE
30/1 & 11/2	Canola stubble	114	36 (68)			S	EP
21/2 & 16/3	Canola stubble	35	3 (91)			TR	EP
11/2 & 17/2	Wheat stubble	55	26 (51)			TR	EP
17/2 & 29/4	Canola stubble	224	47 (79)			C at 38°C+G	SE

*TR tyre roller, SR stone roller, S slasher, C cable, G grazing
+ Regions – YP Yorke Peninsula, EP Eyre Peninsula, SE South East South Australia

CONCLUSIONS AND RECOMMENDATIONS

Snail management is a three phase operation, occurring post harvest, during the growing season and at harvest.

Knowing how many snails of each type and size are present is critical if appropriate management is to be applied.

Snail density - above 30/m2 bait should be applied.

Baiting should start earlier but the following precautions should be observed:

- Bait degrades in UV light - you cannot put it out and wait for rain!
- Snails need at least 1mm of rain before they leave their resting places. Snails only find bait when moving. Delay baiting until a large proportion of snails are active.
- For high levels of mortality the ground needs to stay moist for 5-7 days after baiting.
- Snails are immature in summer and egg laying does not occur, but they do mature rapidly after the opening rain.

Baiting reduces snail numbers by 60-80%.

Baiting rates should be based on snail density. Count of live snails before baiting and seven days after baiting to assess baiting success:

- 20 snails/m^2 start planning baiting
- up to 80 snails/m^2 use 5kg/ha green baits
- over 90 snails/m^2 use 10kg/ha green bait or 5kg/ha blue bait
- 3 snails/m^2 in emerging canola monitor closely and bait 5kg/ha green bait as soon as damage occurs.

Difference in the success of control methods depending on snail type

Control method	Round snails	Conical snails
Stubble management	++	+
Baiting	++	+
Burning	++	+
Windrowing	+	-
Machinery settings/sieves	+	-
Pusher bars	+	-
Biological control	-	+

More information on snail identification, life cycles and management is available on the web page.
http://www.sardi.sa.gov.au/crops/entomolo/entomolo.htm