OSR Herbicides?
Think Water

Soil management and cultivations

Oilseed rape plays a valuable part in many farm rotations as a break and 'cleaning' crop, especially where black-grass is a problem. However, keeping herbicides out of drinking water sources is key to preventing restrictions on use, or even loss of the products.

Why does soil management matter?

The effects of soil management on the speed of pesticide movement from soil to water vary considerably. Heavy compaction can lead to accelerated run-off, while increased flow of product through the soil profile to drains can arise from extensive cultivation.

Where poor soil structure exists, solutions such as sub-soiling are best implemented when sowing crops other than winter oilseed rape.

THE KEY HERBICIDES

carbetamide
clopyralid
metazachlor
propyzamide
quinmerac

Understanding field issues – soil structure

To assess your soil structure, dig a hole and examine the soil. This will show you the likelihood of herbicides flowing to water courses.

	TOPSOIL	SUBSOIL
Well structured	Plenty of spaces or pores between the aggregates. You can easily crumble moist soil clumps between your thumb and finger	Larger blocks or clumps than the topsoil, with many vertical cracks or channels. It can easily be broken apart when moist.
Poorly structured	Dense aggregates of soil with few pores. You will find it hard to break the clumps apart even when the soil is moist.	Dense and may form a hard pan with few pores or cracks in the soil. Below the pan, the soil structure may be satisfactory, or the compaction may go deeper into the subsoil.

Extract from: Environment Agency **"Managing soil types"**
https://www.gov.uk/guidance/managing-soil-types

While well-structured soils can ease drainage, poorly structured soils will encourage run-off and erosion.

Pay attention to soil moisture content as well. Herbicides will be lost more easily, usually by run off, from soils at field capacity.

Long term, activities to increase organic matter in the soil will improve soil structure and soil moisture capacity, and increase pesticide retention in the top soil. However, very high levels of organic matter can affect the performance of some pesticides.

For more information see: A Guide to Better Soil Structure http://www.landis.org.uk/downloads/

Soil compaction

Soil structure is often damaged if soils are worked when they are too wet or if there is too much traffic (e.g. tramlines and headlands); check for poor soil structure, compaction and pans. Remedy with appropriate timely cultivation and/or sub-soiling.

Deep sub-soiling and mole draining can improve soil structure and drainage by cracking soil pans, but can create large cracks which increase pesticide losses from the field (by-pass flow). Use a spade to check if there is a pan and its depth.

If there is no pan do not sub-soil; if there is a pan, cultivate to just below the pan.

Pre-cultivation operations

Operations before field cultivation can improve drainage. However, careful attention must be paid to soil and weather conditions to avoid damaging soil structure or causing compaction.

Mole draining is only suited to soils with at least 30% clay content. The subsoil needs to be sufficiently moist for a stable channel to be formed, but the upper soil profile should be sufficiently dry for cracking to occur.

Do not mole drain before an oilseed rape crop as the risk of pesticides moving to water is high.

Subsoiling in correct conditions can be used to restore soil structure and improve permeability.

Avoid subsoiling before an oilseed rape crop unless there is a serious soil pan to address, as the risk of pesticides moving to water during autumn and winter is high.

For further information on mole draining and subsoiling see the AHDB Field Drainage Guide: https://cereals.ahdb.org.uk/media/725158/g68-ahdb-field-drainage-guide.pdf

Cultivations before drilling

Cultivations can have a marked effect on both slug populations and weeds. Primary cultivations to begin seedbed preparation are a balance between bringing older buried weed seeds to the surface and burying newly shed seed. Soil acting herbicides tend to work best when weed seeds are near the soil surface. Herbicide performance and water protection are likely to be improved by reducing drainflow losses through minimum/shallow tillage (<5cm deep), direct drill and no-till systems. Practical advice on reducing losses through field drains can be found on Oilseed Rape Herbicides – Information Sheet 12.

When preparing the seedbed aim for a firm, not too fine seedbed that will aid germination and deter slugs.

For more information see:

AHDB oilseed rape guide, summer 2015, page 18-19: https://cereals.ahdb.org.uk/media/493856/g65-oilseed-rape-guide.pdf

Managing weeds in arable rotations – a guide, AHDB 2014, pages 6-7: https://cereals.ahdb.org.uk/media/433546/g61-managing-weeds-in-arable-rotations-a-guide.pdf

Use this check list to review your actions

		YOUR ASSESSMENT				
Objective	**Detailed actions or issues**	**I'm doing this**	**Maybe I could do this**	**Not doing this**	**I will investigate**	**Not applicable**
Reduce drainage losses by improving soil structure	Monitor soil organic matter levels	☐	☐	☐	☐	☐
	Increase soil organic matter levels	☐	☐	☐	☐	☐
	Avoid field traffic in wet conditions	☐	☐	☐	☐	☐
	Check for pans – visual/experience	☐	☐	☐	☐	☐
	Check for pans – with a spade	☐	☐	☐	☐	☐
	Pre-cultivation	☐	☐	☐	☐	☐
	Avoid mole draining before rape	☐	☐	☐	☐	☐
	Avoid sub-soiling before rape	☐	☐	☐	☐	☐
	Firm seedbed	☐	☐	☐	☐	☐

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The Voluntary Initiative
Promoting responsible pesticide use