

Drains need maintenance

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carried out between mid-May and mid-September in ditches likely to contain trout or fish eggs. Furthermore, hedgerows adjacent to drains should not be cut between 1 March and 31 August.



Maintenance improves the capacity and the lifespan of the drainage system

Open drains or in-field piped drains can greatly improve utilisation of grass on heavy soils. But the days of “one size fits all” are long gone. New drainage works should follow the guidelines of the Teagasc Manual on Drainage and Soil Management and involve site-specific designs, which are evaluated for financial viability, as well as technical feasibility before being installed. However, it is vital to maintain all drainage works as this will extend their lifespan, increasing the return on your investment.

The performance of a drainage system will inevitably deteriorate over time, due to a variety of blockages in both open and in-field drains. Maintenance vastly improves the capacity and the lifespan of the drainage system by increasing water flow, but also promotes sediment trapping and the retention of nutrients. Following the installation of a drainage system, a maintenance plan should be drawn up for both in-field and open drains, focusing on areas which are susceptible to blockages.

Open ditches can also provide an important habitat for a variety of plants and animals (including trout and salmon). Where work on open drains is necessary, this initial “big job” and subsequent maintenance should be

Causes of blockages

- Fine soil particles such as silt and clay are many times smaller than the aggregate (e.g. stone) around a pipe or the slits in the actual drainage pipe. This means they can get washed from the soil, through the aggregates, through pipe slits and eventually get shunted along the pipe where they may settle if water flow is low. This impedes flow through the pipes.
- Iron pans form in soil due to the downward washing of iron in the soil profile. This iron-rich material can accumulate in drains and impede flow.
- Plants and their roots can thrive in open channels, at the pipe outlet and deep within the pipe system causing blockages.
- Collapse/sedimentation of open drains, due to flow conditions, undercutting of banks or livestock damage can also cause impediments.

Avoiding blockages

Upgrade and deepen existing open drains before in-field drain installation to ensure good outfalls and consistent flows.

Prevent cattle access to open drains and outlets. Use simple layouts with few junctions to reduce the potential for blockages; use manholes as access points within the network, particularly at junctions.

The upstream end of field drain

REMEMBER

- Regularly clean out sediment from your open and in-field drains.
- Leave the spoil beside the open drain.
- Use the mid-May to mid-September window.
- Spread spoil on wetter parts of the landscape.
- Spread spoil on dry parts of the land away from the open drain.
- Spread spoil on P Index 4 soils.

Figure 1: Examples of where problems/blockages may arise

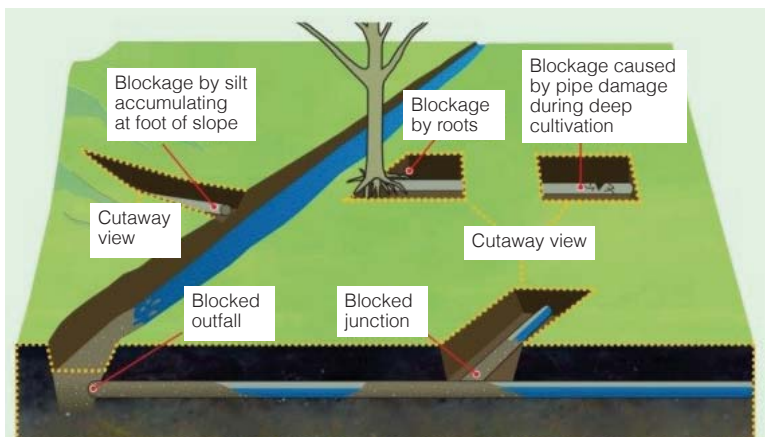
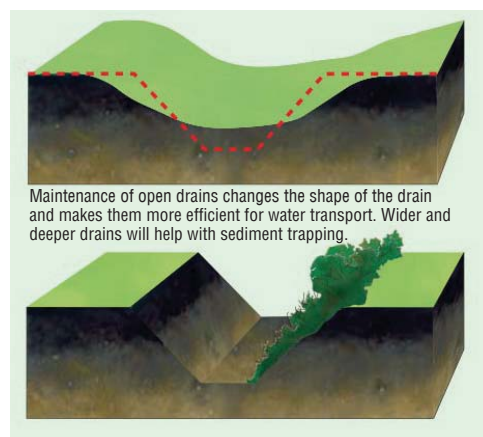


Figure 2: Maintenance of open drains



Maintenance of open drains changes the shape of the drain and makes them more efficient for water transport. Wider and deeper drains will help with sediment trapping.

What methods help to unblock field drains?

Jetting is an efficient way of cleaning piped drains. A hose, fed through the pipe washes and flushes sediment, iron ochre and debris from its internal walls, perforations and adjacent stone fill. Some models can extend to 300m up the pipe. Although rodding is also an option it is more labour intensive and a less effective alternative.



It is vital to maintain all drainage works as this will extend their lifespan, increasing the return on your investment.

IN-DEPTH INFORMATION

Land drainage booklet

A freely downloadable practical guidebook to land drainage is available via the Teagasc website, www.teagasc.ie/publications. Search "land drainage"

Land drainage manual

The Teagasc Manual on Drainage and Soil Management is available from Teagasc offices or can be ordered via the Teagasc website, www.teagasc.ie/publications. Search "Teagasc manual on drainage and soil management" (pages 107 to 110).

pipes can be brought to the field surface and capped to allow an access point for drain jetting. Mark the locations of field drain outlets and manholes in the field and on-farm maps as this will help to locate access points for future maintenance. Always use pipes in in-field drains to allow for maximum water flow and maintenance by jetting or rodding. Ensure that the aggregate used above the pipe is washed and 10mm to 40 mm in size. At present, there is no evidence to suggest that membranes on top of aggregate or around pipes help to slow sedimentation but they may impede water flow.

A focus on open drains/ditches

Depending on their landscape position, open drains conduct surface water (during and shortly after rainfall) and/or groundwater.

Open drains can flow during times of little or no rainfall if the water table intersects the drains or spring

lines are in contact with the drains. Open drains should be as deep as possible, to intersect groundwater and provide suitable outfall from in-field drains, and be formed with a graded profile to prevent collapse.

Maintenance of open drains changes the shape of the drain and makes them more efficient at transporting water.

The bank slopes of open drains need to be appropriately graded to prevent collapse. This will depend on how deep your channel is and how fast the water moves and, of course, your soil type. If grades as in Table 1 cannot be achieved then piping of new open drains may be necessary. At all times, open drains must be deeper than field drains and you should protect field drain outlets from damage. Importantly, spoil removed from such works should be spread on dry areas of land away from drains, to add to soil fertility and prevent it from getting back into the drain.

Table 1

Soil	Channel < 1.3m deep	Channel > 1.3m deep	Max. water velocity (m/sec)
	Horizontal: Vertical		
Heavy clay	0.5:1	1:1	1.5
Clay or silt loam	1:1	1.5:1	1.0
Sandy loam	1.5:1	2:1	0.75
Sand	2:1	3:1	0.75

