

# Seed Needs

A guide to germination and establishment of grass seed

There are three key factors which drive successful germination and establishment of grass seed:

**Water**

**Oxygen**

**Warmth**

## Water

Seeds need water to start to swell and soften, initiating the germination process. Germination then occurs when the first tiny root hairs emerge from the seed. From this point moisture continues to be a key requirement, preventing the emerging seedling from drying out before it can connect with the soil or growing medium and become established.

In the autumn there is a high chance of enough precipitation to enable young grass plants to build strong root systems during warmer periods. In the spring we are, in theory, heading towards increasing dryness. Grass plants that germinate in the spring have less time to build up resilient root systems, reducing their ability to survive the upcoming dry weather.

## Oxygen

The energy for seeds to germinate comes from the respiration process in which oxygen from the air reacts with the seeds stored sugar reserves to release energy enabling cells to divide and grow. The amount of oxygen held in the pore spaces of a soil can be reduced if it is waterlogged, compacted or has a hard surface. Good soil management helps to ensure that seeds have sufficient oxygen for germination and onwards growth. Correct sowing depth also helps to ensure the seedlings have enough energy to establish:

Species	Optimum sowing depth (mm)
Perennial ryegrass	12-15
Red fescue	4-5
Browntop bent	1-2

## Warmth

Warmer soil temperatures increase the speed of enzyme reactions and processes such as cell division leading to faster germination and establishment. Each grass species has a slightly different range of preferred temperatures for germination:

Species	Optimum temperature range (°C)
Perennial ryegrass	7-25
Red fescue	15-25
Browntop bent	12-21

Soils act like a storage radiator, taking time to build up heat initially but over time storing the residual solar energy. Inevitably, the soil will be much cooler in the spring than in the autumn even if air temperatures are similar because there has not been sufficient time to build up residual heat. Germination therefore tends to be slower in the spring than it would be later in the year.

## Finding a balance

The factors which drive successful germination and establishment of grass seed tend to occur in the UK in the spring and the autumn which is why these are the key times for seed sowing. However, there are important differences between these seasons.

**Autumn: Consistent moisture and warmth without extremes of cold or dry**

**Spring: Good moisture potential but, a risk of both cold and dry weather**

The good news is that with knowledge of seed establishment requirements and environmental conditions it is possible to successfully establish grass seed in both the autumn and spring in the UK.

The key point is that while you cannot control the weather, you can control the amount of water that is provided and improve the aeration of the soil.

## Process

Prepare the ground	
New Seed Bed	Overseeding
<ul style="list-style-type: none"> <li>Remove unwanted vegetation</li> <li>Cultivate the soil to a depth of 150mm removing stones and debris</li> <li>Level, then firm the seedbed</li> <li>Rake the surface to produce a fine tilth</li> </ul>	<ul style="list-style-type: none"> <li>Mow the grass with the mower blades set low and removing the clippings</li> <li>Remove excess thatch</li> <li>If compacted, aerate the soil</li> </ul>
Provide nutrition	
<ul style="list-style-type: none"> <li>Send soil to be tested in a laboratory</li> <li>Use the results to decide whether to incorporate additional organic matter, fertiliser or lime               <ul style="list-style-type: none"> <li>Apply a pre-seed, phosphate rich, fertiliser to assist growth of young plants</li> </ul> </li> </ul>	
Provide water	
<ul style="list-style-type: none"> <li>If there has been little rainfall irrigate gently and slowly to fully wet through the soil profile               <ul style="list-style-type: none"> <li>A penetrant wetting agent could help with re-wetting soils if needed</li> </ul> </li> </ul>	
Sow seed	
<ul style="list-style-type: none"> <li>Sow seeds evenly using the correct sowing rate and depth for the seed mix               <ul style="list-style-type: none"> <li>Lightly roll to provide better seed to soil contact</li> </ul> </li> </ul>	
Provide water	
<ul style="list-style-type: none"> <li>Keep the soil surface moist but not wet until the seeds have germinated AND established               <ul style="list-style-type: none"> <li>Irrigate slowly and gently to avoid disturbing the seeds</li> </ul> </li> </ul>	