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The European Agricultural Fund
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Why Drain?



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Land Drainage



- Some impacts of poor land drainage are “concealed ” and hard to quantify
- The impacts of failing drainage systems “creep” in to the system and have an accumulative impact on productivity

Land Drainage

- Expensive
- Difficult
- Boring

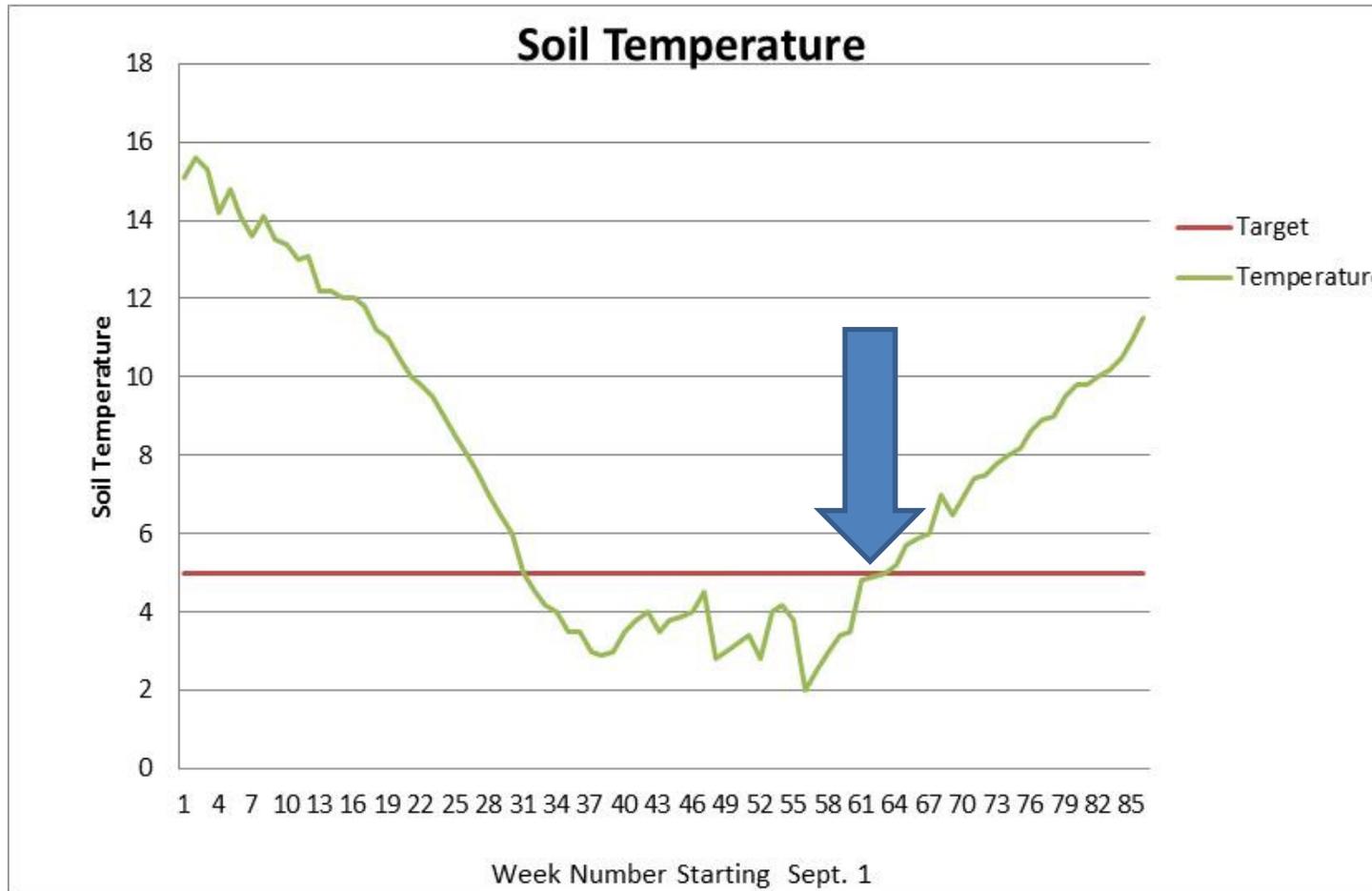


Soil Temperature



- Water has a very high heat capacity
 - Keeps soils cold in the spring
- Most commercial crops will not begin growth until soils temperature are above 5° C
- Poorly drained soils spend longer periods below this critical target

Soil Temperature



Soil Temperature

Table 1 B Effect of tile drainage on yields of five different crops

Crop	Average Yield before tile drainage	Average yield after tile drainage	Yield increase	
	tonne/ha	tonne/ha	tonne/ha	%
Grain corn	4.14	5.58	1.44	34.8
Soybeans	1.96	2.59	0.63	32.1
Wheat	1.77	2.61	0.84	47.5
Oats	1.60	2.35	0.75	46.9
Hay	4.10	5.20	1.10	26.8

(from Colwell 1978)

Rush Control – Main Point



- Rush infestation appears to be an increasing problem
- Direct control is expensive and inefficient
- Efficient control requires changing and effective soil and sward management

Rush Control – What are they



- Soft Rush (*Juncus effusus*) a semi aquatic native perennial found throughout Scotland
- Can reproduce vegetatively and from seed
- Produces upwards of 10,000 seeds per year
- Seeds can remain dormant in the soil for decades
- Deep rooting systems that modify soil conditions to suite themselves

Rush Control

Soft Rush is commonly sold commonly as robust ornamental

Soft Rush



Common Name: Soft Rush
Genus: *Juncus*
Species: *effusus*
Skill Level: Beginner
Exposure: Full sun, Partial shade
Hardiness: Hardy
Soil type: Acidic, Moist, Boggy
Height: 100cm
Spread: 30cm
Time to plant seeds: February to May
Time to divide plants: October to March

This native sedge is common on boggy, peaty soil where it forms upright sheafs of cylindrical green stems, dotted with clusters of tiny brown flowers. In gardens, it is most often grown as the bizarre, twisted f. spiralis.

Source : BBC plant finder website

Rush Control



- A healthy grass sward will always outcompete rushes
- Rushes need an opportunity to grow which occurs when the sward is struggling
- Once rushes have moved in your best option is control (if required) and good soil and sward management.
- Need to understand what is holding grass back

Rush Control: Main Risks



- Drainage
 - Rushes can remain productive under wet conditions whereas grass growth declines
 - Failing drains result in longer periods of the saturated soils in the front and back end
 - More time spent below 5° C
 - Maintenance and investment in drainage

Rush Control: Main Risks

- Broken Swards provides opportunity for Rushes to grow
 - poaching
 - badly timed reseed
 - failed reseed
 - Increased risk in late winter



Rush Control: Main Risks



- Compaction
 - Grass sward will be more seriously impacted by compaction than rushes
 - Rushes have a more complex fibrous root system than grass
 - Poor grass growth resulting from compaction provides an opportunity for rushes to get away

Main Risks



- Poor nutrient management
 - Grass is continually being cut or grazed whereas rushes are not
 - Rushes gain an advantage if the amounts and timing of N, P, and K are insufficient to allow grass to recover
 - Soil levels of P and K are crucial for a healthy sward in the spring

Rush Control: Main Risks



- Grazing practices
 - Over grazing in winter and under-grazing in the spring and early summer can encourage rush growth
 - High stocking density and grazing in wet conditions will increase risk of compaction and poaching

Rush Control: Main Risks



- Poor acidity management
 - Rushes remain productive over a wider range of soil pH values
 - As soil pH drops to below the target of 5.8 to 6 they gain a competitive advantage over grass

Trafficability

- Land should not be managed or grazed when the soil is above its plastic limit (wet).
- In-bye land should only be used for out wintering of livestock if it is effectively drained



Drainage Maintenance



- Mark outfalls clearly.
- Clear outfalls on a regular basis (annual / bi annual).
- Clear ditches on a regular basis: Clay soils every 3 to 5 years, Peat soils every 2 to 3 years sandy soils every 1 to 2 years.
- Keep trees, shrubs and bushes on the banks cut back every 3 to 5 years (**Especially important on flood banks**).
- Long term drainage investment plan

Any Questions?

