

TILLAGE TO AVOID TRAMLINES

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Description

Tramlines are semi-permanent wheel ways for farming machines to travel down during spraying and fertilising operations without causing wheeling damage to the rest of the field, a practice sometimes referred to as 'controlled traffic'. Thus tramlines are important vectors of runoff, causing increased mobilisation of sediment and phosphorus. Uncultivated wheel tracks have very low infiltration rates and are effective paths for sediment and P transport via surface run-off, especially after multiple tractor passes. The solution could be either to delay the establishment of tramlines until crop cover has been established (or alternatively until the spring), or to shallow cultivate them using a simple goose-foot tine.

Rationale, mechanism of action

Compacted tramlines can result in the channelling of surface water and the development of rills and gullies on erosion-susceptible soil. The reason is the critical shear stress of water flow created by the channelling effect and subsequent encroachment on surrounding soil. Avoiding tramlines over the winter therefore helps to prevent soil erosion, accelerate run-off and decrease P losses. This helps prevent the down slope transport of sediment-bound and soluble pollutants. Tramlines can act as a flow pathway during periods of increasing surface run-off, e.g. in snow melting and heavy rainfall. Avoiding their use in the winter reduces run-off volumes while mechanical disruption of tramlines in reduced tillage can minimise their negative effect [1].

Applicability

This method is applicable for winter cereals in most arable farming (sandy-loamy-silty clayey soils) and particularly on light soils in areas with higher winter rainfall and snow cover. It is not applicable for most oilseed rape crops, due to the need to apply pesticides during the autumn period. For spraying pesticides on such crops, low ground-pressure vehicles should be used. Establishing accurate tramlines post-drilling may be facilitated by the increasing use of GPS systems.

Effectiveness, including certainty

Nitrogen: Avoiding/disrupting tramlines has no effect on nitrate leaching.

Phosphorus: In a study during a winter with repeated run-off events, Total P runoff was 1.3 kg ha⁻¹ less after disruption of the tramlines compared with untreated areas with tramlines [2]. The effect on dissolved P may be small [1]. After adjusting for 'expert weighting', the reduction in the soil component of P was estimated at 25% in the UK [3].

Time frame

Avoiding/disrupting tramlines involves short-term implementation.

Environmental side-effects

No known side-effects.

Relevance, potential for targeting

Easy to encourage and may be used for targeting.

Costs: Investment, labour

Disruption of tramlines has been found to be highly cost-efficient in the UK [2].

References

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- [3] Cuttle, S., Macleod, C., Chadwick, D., Scholefield, D., Haygarth, P., Newell-Price, P., Harris, D., Shepherd, M., Chambers, B. & Humphrey, R. (2006) *An Inventory of Methods to Control Diffuse Water Pollution from Agriculture (DWPA) USER MANUAL*. Defra report, project ES0203, 115 pp. p. 19
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