Preventing Soil Loss and Diffuse Water Pollution: Management costs, levels of reduction and practicality of implementation

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Option/ Cost[a]	Action	Benefits	Practicality	Level of reduction
1	No cultivation within 2 m of a water course	Reduced nutrient loss	Easy to implement	High
2	If needed, move feeders and water troughs to reduce extensive soil damage and run-off to nearby surface waters	Reduces nutrient loss, soil compaction and yield loss	Depending on water points this should be straightforward but could have cost implications to establish water points	High
3	Don't travel over fields in wet conditions or reduce access if unavoidable to reduce compaction	Reduces soil compaction, reduces yield loss, maintains drainage	If possible, reduce traffic depending on the weather conditions and the time of the year	Medium
4	Increase soil organic matter content (including chop and incorporate cereal stubble)	Helps maintain soil structure and drainage, increases yield and soil health	Incorporate more crop residues and cover crops. Straight forward to employ	Medium
5	Suitable crop for the soil texture and slope	Reduces potential soil loss and increases yield	Needs consideration of drilling technique and current crop rotation	Medium
6	Adopt and use nutrient management plan, including timings of application and liming	Reduces fertiliser use, saves costs, potentially reduces greenhouse gas emissions	Encourages efficiency	Medium
7	Reduce cultivation – conservation tillage where appropriate	Increases soil organic matter and soil stability, reduces labour costs and fuel use	Practical but potential increase in herbicide use, difficult to correct any soil compaction issues	Medium
8	Timing of agricultural practices – keep off land in winter or when not suitable, if possible	Reduces soil compaction, potential erosion, reduces yield loss	Should be done as often as possible depending on the field conditions	Low
9	Use of VESS to detect compaction and soil structural degradation	Increased awareness of soil structural quality and associated yield and drainage benefits	Training may be needed but easy to employ	Low
10	Move gateways – add gateways to the field where required	Reduces soil compaction and increases yield. Eliminates diffuse pollution pathway	Expense of new gates and could affect hedge rows	High
11	Beetle banks	Reduces nutrient loss, increases pollinator diversity, increases carbon sequestration	Has cost implications and needs consideration of field	High
12	Change cropping from veg to cereals, or cereals/veg crop to grassland fields at high erosion risk	Increases soil organic matter content and maintains soil surface structure	Practicality depends on crop rotation and farm type	High
13	Cultivate alternating strips of crops (ordinary crops separated by strips of close growing erosion resistant crops) across the contour where practical	Reduces soil compaction, reduces nutrient loss and can increase yield	Needs decisions on crop types and the suitability of machinery available	Medium
14	Strip grazing across the slope, starting at the highest point of the field	Reduces nutrient loss and soil compaction, increases soil organic material	Needs extra fencing and labour to move the fences on a regular basis	Medium

Option/ Cost[a]	Action	Benefits	Practicality	Level of reduction
15	Avoid wetter fields to reduce poaching and surface capping and by reducing grazing in wet conditions	Reduces nutrient loss and soil compaction, maintains drainage and sward yield and density	Needs to consider grazing rotation, weather and field conditions	Medium
16	Fence off livestock from rivers and streams	Reduces nutrient loss and potential animal injury	Cost of fencing and contractors but easy to implement	Medium
17	Cultivate across the slope - Re-align tramlines away from the steepest part of the slope	Reduces soil compaction, reduces nutrient loss and can increase yield	Needs consideration of the crop and machinery involved	Medium
18	Use of green manure or cover crops	Increases soil organic matter and potentially yield - reduces fertiliser use	Cost implications but easy to implement	Medium
19	Undersowing spring cereals	Maintains soil organic matter	May have cost implications if extra machinery is required	Low
20	Soil compaction alleviation in grassland soils and tramline disruption in arable and root crops	Increases drainage and potentially increases yield	Needs specialist equipment but easy to employ	Low
21	Remove management of field corners	Increased soil organic material, reduced nutrient loss	Needs consideration in relation to the crop being grown	Low
22	Grass boundaries, in-field buffers or filter strips, especially at the bottom of slopes	Increases soil organic matter, prevents soil loss, increases nutrient efficiency	Depends on slope of the farm fields and crops grown	High
23	Cultivate soils in the spring not autumn, including slurry and manure incorporation	Increases nutrient use efficiency, increases soil organic matter	If suitable to the crop rotation and access to manure and slurry	Medium
24	Establish and maintain wetland areas and/or water retention ponds	Increases carbon sequestration, reduces diffuse pollution	Needs consideration of location and suitability of the fields	High
25	Implementation of field drainage	Reduces nutrient and soil loss, helps retain soil structure	Cost of implementation and the knowledge for a suitable scheme	Medium
26	Use bridges for animal movements across streams	Reduces nutrient loss and potential animal injury	Cost of bridges would be high but would help maintain banks and herd foot health	Medium
27	Agro-forestry	Increased carbon sequestration, reduced nutrient loss and increased animal welfare and yield	Cost implications and consideration of suitable fields	Medium
28	Establish new hedges	Reduces nutrient loss, increases carbon sequestration	Cost of implementation	Low
29	Reduce vehicle size and/or use reduced pressure tyres, use of flexible tyres	Reduces soil compaction, reduces yield loss	Could help reduce machinery costs but increase fuel and labour costs	Low
30	Increasing tramline spacing	Reduces soil compaction, reduces yield loss	Needs suitable equipment to be available	Low

[a] Colours indicate level of cost – **green** = low cost (<£250 or <£50/ha), **yellow** = medium cost (<£500 or <£150/ha) and **orange** = high cost (>£500 or >£250/ha)
For further information see **https://www.crew.ac.uk/publication/state-knowledge-overview-identified-pathways-diffuse-pollutants-water-environment**