

Biomass Buffer Strips

Using biomass crops for multipurpose land management.

- Buffer strips consist of planting strips of either grasses, other herbaceous perennials or tree species in 6-20 m wide strips along field margins or beside watercourses to reduce flood risk, soil erosion, and groundwater pollution from agricultural land.
- Leaching of fertilisers is known to be a main cause of eutrophication. Biomass crops have been shown to act as a biological filter, taking up N and P from fertiliser run-off. The nutrients that would otherwise be lost can actually benefit the growth of biomass, increasing yields while simultaneously improving the functioning of the buffer and reducing pollution of watercourses.
- Harvesting biomass regularly helps reduce pollutant load by removing excess nutrients and pollutants taken up by the plants in addition to providing a harvestable biomass resource.
- Biomass crops can also provide a number of additional benefits to soil health and biodiversity. The biomass produced can be used on-farm for heating and animal bedding, or sold for heat and power generation where local markets are available.
- Site logistics such as access and operating space for harvesting machinery needs to be considered in planning the locations of biomass buffer strips. Integrated buffers with earthworks to direct and control run-off have been shown to work best with biomass buffers. The greater the level of engineering can lead to higher establishment costs, but also greater long-term benefits.
- There are no current incentives available for biomass crops or SRF <8 year rotations. Other grants for buffer strips are available under [ELMS](#) & [EWCO](#).

Examples of biomass crops and SRF species suitable for use in buffers strips

Energy Grasses

- Reed canary grass
- Miscanthus
- Switchgrass
- Perennial (high sugar) forage grasses.

Short-rotation coppice (SRC)

- Willow
- Poplar
- Eucalyptus
- Many other tree species may also be coppiced*

Short-rotation forestry (SRF)

- Alder (red, grey and black)*
- Ash*
- Aspen
- Birch (silver, downy)
- Eucalyptus*
- Poplar
- Southern-beech
- Sweet chestnut*
- Sycamore*



Slope is a key consideration for planning a biomass buffer strip:

Low gradient	<ul style="list-style-type: none"> Gentle slopes (<7%) or flatter areas at the bottom of slopes are suitable for planting strips containing more energy dense biomass crops such as miscanthus and willow (SRC). Provided access is unhindered, mechanised harvesting should be possible without impacting functionality of the buffer strip.
Intermediate gradient	<ul style="list-style-type: none"> Steeper slopes naturally increase flow rate and make harvesting more challenging. Low maintenance crop options suited to specific soil conditions should be considered, such as grasses with short-rotation forestry. The grass strip should be widened, and the species selected should be tough enough to withstand higher quantity and velocity run-off flow.
Steep Gradient	<ul style="list-style-type: none"> Buffers on steep slopes should be managed predominantly for prevention of erosion and particulate P run-off. Stiff-stemmed grasses and scattered trees to maximise infiltration and provide deep root structures to stabilise banks Biomass production is limited to firewood production due to difficulties of harvesting and the requirement of longer rotation lengths.

Biomass Buffer Strips - Design examples for different scenarios

Figure a. Low gradient option: 20 m wide high-energy buffer incorporating energy grasses, SRC and SRF with a small undisturbed zone.

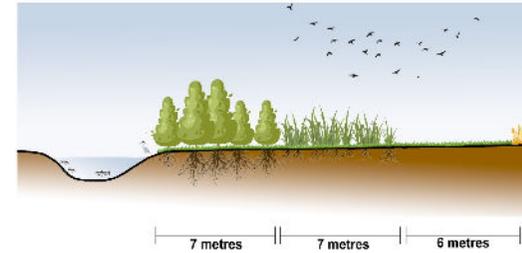


Figure b. Low gradient option - 15 m wide high-energy buffer incorporating ditch for water drainage, energy grass, SRC or SRF and undisturbed zone

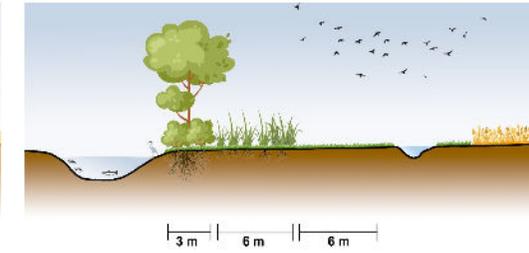


Figure c. Low-intermediate option – Narrow agroforestry buffer incorporating mixed SRF for firewood use on-farm. Will require fencing between pasture and buffer.

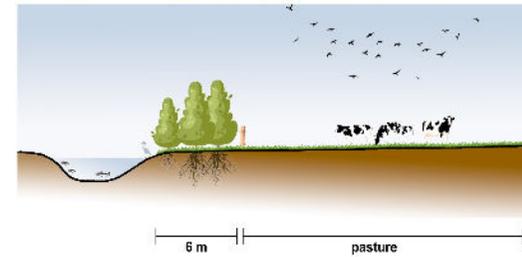


Figure d. Intermediate gradient option – gentle slope, wide buffer with mixed grasses, mixed SRF, and an undisturbed zone.

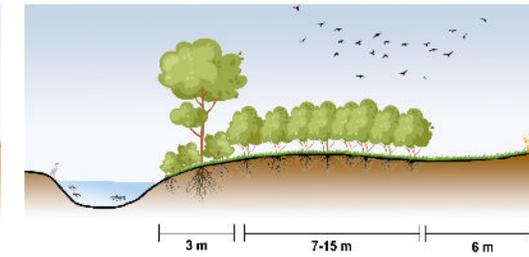


Figure e. Intermediate gradient option – Steeper slope, extended grass strip and mixed strip with grasses and mixed SRF.

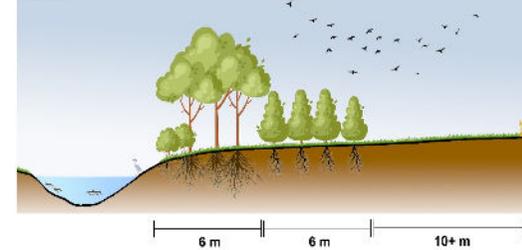


Figure f. Steep gradient option – Very steep slope, wide grass strip with mixed SRF managed for firewood use on-farm.

