

Increasing the Biodiversity of Roadside Verges: Cormac Wildflower Turf Trial

St Austell, Cornwall

Cormac

BIG Biodiversity Challenge Award Category: **Innovation Award**

Project overview (50 words max)

A small native wildflower turf trail was performed at Cormac's Wheel Eliza Nursery in 2023. The trial was to determine whether we could successfully grow wildflower turf on a small scale, what biodegradable mesh to use and what the optimal conditions were to grow the turf.

46 words

What were the biodiversity conditions on site prior to the enhancement? (100 words max)

Installing wildflower strips in fertile soils is an important practice for increasing biodiversity, however fertile soils encourage competitive species leading to the low diverse grasslands observed across Cornwall's roadside verges. Numerous experimental studies have been carried out to solve this problem, by following a strict cut and collect regime to reduce fertility which encourages success of the wildflower installations. There are different ways to incorporate wildflowers into an area, seeding, turf or plugs each having their own utility. The focus of this trail is turf as it offers weed suppression, low labour input and can reach maturity in 8-12 weeks.

100 words

What were the reasons behind this project? (100 words max)

Cornwall Council's commitment to reducing CO2 emissions, increasing biodiversity and joining up fragmented landscapes has led to the introduction of projects such as Making Space for Nature whose main goal was to increase biodiversity throughout Cornwall in urban areas. However, overlooked are roadside verges which cover an area of 313,500 miles in the UK, equivalent to the remaining species rich grasslands. An opportunity exists to increase biodiversity of roadside verges, reduce maintenance costs for Cornwall Council and create projects for Cormac. Some successful verge transformations have already occurred in Cornwall, such as the A391 where wildflower turf was laid by Cormac.

101 words



Wildflower turf from the trial in situ at Campdowns Cemetery, Cormac



*Example of previous successful verge transformation along the A391, St Austell.
Photo Credit: Cornwall Council*

What were the biodiversity measures taken? (300 words max)

Led by Cormac's Chargehand Teresa Buzza, a small native wildflower turf trial was performed at Wheal Eliza Nursery during 2023 in the existing poly tunnel where there was space and environmental control. The main aims of the trial were to determine:

- Whether we could successfully grow wildflower turf on a small scale,
- What biodegradable mesh to use and
- What were the optimal conditions to grow turf.

The method of the trial consisted of 8 wooden hinged 1m² frames which were constructed with a removable hinge to allow the frame to be removed from the wildflower turf. These were placed in the polytunnel onto impermeable plastic sheeting.

Each frame was assigned an alphanumeric designation depending on whether it:

- Had a 3cm sand base (S),
- Was lined with either jute (J) or eco veggi mesh (VM),
- Whether the mix of annual grasses to native and naturalised wildflowers was 20% grasses and 80% wildflowers (W) or vice versa (G).

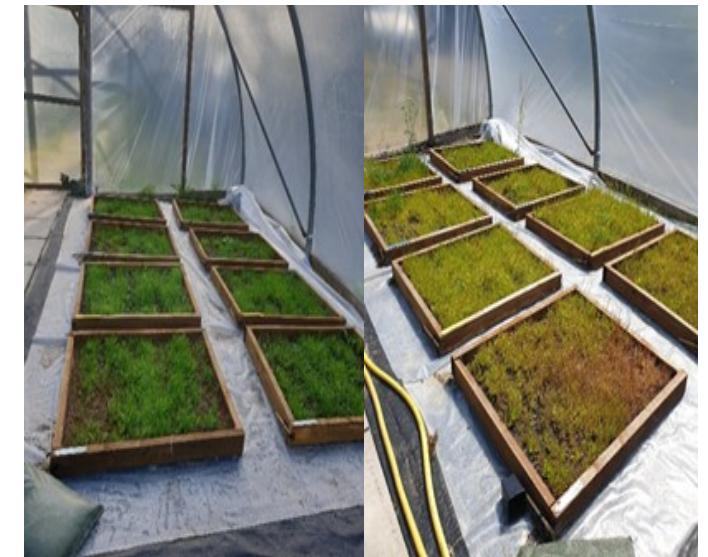
Once seeds had germinated and reached an adequate size, the frames were checked by pulling the vegetation away from the matting to check rooting had taken place. Once turf was ready, installed into verges and established, monthly checks were made throughout the season to monitor success and gain any insights into which species thrived or died.

The conclusion of the trail was that small scale turf could be grown at the Wheal Eliza nursery with the optimal conditions for growth being wildflowers grown on a base of sand however a delay in moving to phase two of the experiment resulted in the turf being heavy. Heavy turf hinders rollability and moveability which affects individuals transporting and laying the turf. The experiment showed biodegradable veggi mesh to be the superior turf stabiliser, providing room for root growth and allowing rollability.

295 words

Code	Description
1 VMCG	Veggi mesh, compost, grass
2 VMCW	Veggi mesh, compost, wildflowers
1 JCG	Jute, compost, grass
2 JCW	Jute ,compost, wildflower
1 VMCSG	Veggi mesh, compost, sand, grass
2 VMCSW	Veggi mesh, compost, sand, wildflower
1 JCSG	Jute, compost, sand, grass
2 JCSW	Jute, compost, sand, wildflower

Wildflower frame alphanumeric designations and composition, Cormac



Wildflower frames on 15th May and 17th July 2023, Cormac

Further information (250 words max)

Data was gathered mostly based on subjective observations by Cormac employees. Measurements were taken in some cases however estimation, observations and mechanical tests were also performed.

Estimated/observational: Coverage, vegetation to edges & vegetation appearance.

Measured: Thickness and height in centimetres.

Mechanical: Testing rooting to material and rollability.

Plant species were identified, counted and categorised according to the DAFOR scale for abundance.

Turf grown on veggi mesh was generally healthier, benefiting from enhanced vegetation coverage, firmer and widespread rooting to mesh and better rollability without compost loss when compared to the turf grown on jute. Turf with a higher ratio of annual grass to wildflower did not have any noticeable difference in species number than the turf with a higher wildflower ratio across all experimental conditions.

There were many lessons learned from the initial trial and determined that a new trial should be conducted, growing wildflower on a base of sand with veggi mesh, with and without an annual grass. The aim of this new trial will be to determine whether grass is needed to strengthen turf stability and if the turf can be lifted before growing into the sand base. In order for the turf to be ready for lifting it must reach the edges of the frames and form an even thickness of vegetation throughout the frame. Further research needs to be conducted on the effects of polylactic acid plastics (PLA) from which veggi mesh is derived. A body of research is materialising into the effects of bioplastic decomposition into soil with relation to pH levels.



Wildflower turf installation on a bank at Campdowns Cemetery, Carlyon Bay, Cormac

Latin name	Common name	JCSG	JCS W	VMCSW	VMCSG	VMCW	VMCG	JCG	JCW
<i>Achillea millefolium</i>	Yarrow	A	F	D	D	D	D	D	D
<i>Agrimony</i>	Agrimony	X	X	R	R	X	O	R	R
<i>Anthriscus sylvestris</i>	Queen Ann's lace	R	R	X	R	R	R	R	R
<i>Centaurea nigra</i>	Common knapweed	O	R	X	R	R	X	X	X
<i>Cirsium eriophorum</i>	Woolly thistle	R	R	R	X	X	F	X	X
<i>Leucanthemum vulgare</i>	OX-eye daisy	R	R	X	X	R	F	O	O
<i>Lotus corniculatus</i>	Birdsfoot trefoil	R	R	X	R	X	X	X	X
<i>Malva moschata</i>	Musk mallow	X	X	X	R	F	F	X	X
<i>Plantago lanceolata</i>	Ribwort plantain	O	R	F	F	F	X	O	F
<i>Silene dioica</i>	Red campion	F	O	A	A	F	A	F	F

Identifying species using the DAFOR scale, Cormac

Project Team

Cormac – led by Chargehand Teresa Buzza and supported by colleagues at the Wheal Eliza Nursery.

What was the motivation for carrying out the enhancement? (100 words max)

Reducing CO2 emissions (by reducing transportation on out of county wildflower turf products) and increasing biodiversity of Cornwall's roadside verges were the main motivators for this trial. Cormac also have an opportunity to deliver cost savings on maintenance for Cornwall Council if the trial is successful and we can install wildflower turf within verges across the county due to reduced maintenance requirements. Going above our standard delivery requirements, Teresa Buzza, Chargehand has led this trial. It's been carried out with only our own resources and has been strongly supported by the Environment Service Operations Manager.

95 words



Chris Wasley, Horticulture Apprentice & Teresa Buzza, Chargehand who worked on the trial