

## FIELD MARGIN

### Comparison of system management

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#### Summary

A series of three grass and flower field margin treatments was sown in the spring of 1992 each at two seed rates. Assessments of plant biomass were taken at intervals with a detailed survey of plant species on 22 July 1993. The Emorsgate EM1 and EM2 mixtures provided a diverse range of species, but several were not evident in 1993. Many broad-leaved species were established in the Countryside Stewardship mixture. Perennial ryegrass resulted in less biomass than the other seed mixtures. There was no difference in biomass between the sowing rates.

#### Object

To establish and compare the development of different swards and mowing regimes for field margins.

#### Method

Treatments (sown on 14 May 1992)

- 1 Emorsgate EM1 15 kg/ha
- 2 Emorsgate EM1 36 kg/ha
- 3 Emorsgate EM2 15 kg/ha
- 4 Emorsgate EM2 36 kg/ha
- 5 Countryside Stewardship mixture 15 kg/ha
- 6 Countryside Stewardship mixture 36 kg/ha
- 7 Perennial ryegrass 15 kg/ha
- 8 Perennial ryegrass 36 kg/ha

The trial was a systematic layout with no replication. Plot size was 23.5 m by 2 m. Details of constituents of the treatment mixtures are given in Table 1.

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\*Not for publication without the Director's consent. This report deals primarily with only one year's work, so any conclusions given are provisional.

An assessment of species present was carried out on 22 July 1993 (Pack, 1993) using the Domin percentage scale (see appendix Table A1 for description of Domin scale).

Biomass scores were carried out on 16 October 1992, and on 24 June and 4 September 1993. The whole area was mowed once in October 1993.

Table 1. *Constituents of mixtures sown as field margin strips*

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**Emorsgate EM1**

| %  |                    |                                    |
|----|--------------------|------------------------------------|
| 4  | Yarrow             | <i>Achillea millefolium</i>        |
| 4  | Oxeye daisy        | <i>Leucanthemum vulgare</i>        |
| 3  | Musk mallow        | <i>Malva moschata</i>              |
| 5  | Ribwort plantain   | <i>Plantago lanceolata</i>         |
| 3  | Self-heal          | <i>Prunella vulgaris</i>           |
| 3  | Sorrel             | <i>Rumex acetosa</i>               |
| 10 | Bent               | <i>Agrostis castellana</i>         |
| 40 | Crested dog's-tail | <i>Cynosurus cristatus</i>         |
| 10 | Red fescue         | <i>Festuca rubra ssp commutata</i> |
| 10 | Red fescue         | <i>Festuca rubra ssp purinosa</i>  |
| 10 | Red fescue         | <i>Festuca rubra ssp rubra</i>     |

**Emorsgate EM2**

|     |                    |                                    |
|-----|--------------------|------------------------------------|
| 1.5 | Yarrow             | <i>Achillea millefolium</i>        |
| 1.5 | Common knapweed    | <i>Centaurea nigra</i>             |
| 2   | Lady's bedstraw    | <i>Galium verum</i>                |
| 3   | Oxeye daisy        | <i>Leucanthemum vulgare</i>        |
| 3   | Musk mallow        | <i>Malva moschata</i>              |
| 4   | Ribwort plantain   | <i>Plantago lanceolata</i>         |
| 1   | Hoary plantain     | <i>Plantago media</i>              |
| 0.5 | Cowslip            | <i>Primula veris</i>               |
| 1   | Self-heal          | <i>Prunella vulgaris</i>           |
| 0.5 | Hay rattle         | <i>Rhinanthus minor</i>            |
| 3   | Sorrel             | <i>Rumex acetosa</i>               |
| 10  | Bent               | <i>Agrostis castellana</i>         |
| 40  | Crested dog's-tail | <i>Cynosurus cristatus</i>         |
| 10  | Red fescue         | <i>Festuca rubra ssp commutata</i> |
| 10  | Red fescue         | <i>Festuca rubra ssp purinosa</i>  |
| 10  | Red fescue         | <i>Festuca rubra ssp rubra</i>     |

**Countryside Stewardship mixture**

|    |                    |                                    |
|----|--------------------|------------------------------------|
| 25 | Cocksfoot          | <i>Dactylis glomerata</i>          |
| 25 | Red fescue         | <i>Festuca rubra ssp commutata</i> |
| 25 | Crested dog's-tail | <i>Cynosurus cristatus</i>         |
| 25 | Sweet vernal grass | <i>Anthoxanthum odoratum</i>       |

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Note: the ryegrass mix comprised 100% perennial ryegrass (*Lolium perenne*, var. Kent indigenus)

## Results

Biomass scores on 16 October 1992 (Table 2) showed that the Emorsgate EM2 mixture had produced a greater bulk of foliage than the Emorsgate EM1 mixture, but this difference was not evident at the 24 June 1993 assessment. Perennial ryegrass had produced very little biomass on 16 October 1992, but had increased greatly by 24 June 1993. The Countryside Stewardship mixture and the perennial ryegrass treatments had less biomass on 4 September 1993 than the two Emorsgate mixtures.

Table 2. Biomass scores for field margin strips for the 18 months after sowing (score used 0 to 10 scale, where 0 = no plants and 10 = dense and uniform cover)

| Treatment<br>(seed mixtures kg/ha) | 16 October<br>1992 | 24 June<br>1993 | 4 September<br>1993 |
|------------------------------------|--------------------|-----------------|---------------------|
| Emorsgate EM1 15 kg                | 1.0                | 10.0            | 9.0                 |
| Emorsgate EM1 36 kg                | 1.5                | 9.0             | 9.0                 |
| Emorsgate EM2 15 kg                | 3.0                | 10.0            | 10.0                |
| Emorsgate EM2 36 kg                | 2.5                | 10.0            | 10.0                |
| Countryside Stewardship 15 kg      | 2.5                | 7.0             | 6.0                 |
| Countryside Stewardship 36 kg      | 1.5                | 4.0             | 6.0                 |
| Perennial ryegrass 15 kg           | 0.5                | 4.0             | 3.0                 |
| Perennial ryegrass 36 kg           | 0.5                | 3.0             | 2.5                 |

### Broad-leaved species on 22 July 1993

Yarrow and to a lesser extent common knapweed were present in both the Emorsgate mixtures and the lower seeding rate of the Countryside Stewardship mixture, but absent on the perennial ryegrass mixes (Table 3). Oxeye daisy and ribwort plantain were well established on the Emorsgate mixtures, but were less abundant on the Countryside Stewardship mixtures and must have established from the natural seedbank in the soil. The latter species was also present on the lower seedrate of perennial ryegrass.

Self-heal (Table 4) was scattered on the Emorsgate EM1 and EM2 mixtures. The distribution of field horsetail was variable. It was absent on the lower seedrates of both the Emorsgate mixtures, the higher rate of the Countryside Stewardship mixture, and on the perennial ryegrass plots.

Table 3. *Plant species on 22 July 1993 (Domin scale)*

| Treatment<br>(seed mixture kg/ha) | Yarrow | Common<br>knapweed | Oxeye<br>daisy | Musk<br>mallow | Ribwort<br>plantain |
|-----------------------------------|--------|--------------------|----------------|----------------|---------------------|
| Emorsgate EM1 15 kg               | 6      | 2                  | 6              | 2              | 7                   |
| Emorsgate EM1 36 kg               | 5      | 2                  | 6              | 2              | 8                   |
| Emorsgate EM2 15 kg               | 5      | 4                  | 6              | 2              | 8                   |
| Emorsgate EM2 36 kg               | 5      | 4                  | 6              | 2              | 8                   |
| Countryside Stewardship 15 kg     | 3      | 3                  | 2              | 0              | 4                   |
| Countryside Stewardship 36 kg     | +      | 0                  | 2              | 0              | 3                   |
| Perennial ryegrass 15 kg          | 0      | 0                  | +              | 0              | 2                   |
| Perennial ryegrass 36 kg          | 0      | 0                  | 0              | 0              | +                   |

### Grass species

Crested dog's-tail was well established on the Emorsgate mixtures where it had been sown. Red fescue and to a much lesser extent smooth meadow-grass were present on all treatments except the perennial ryegrass mixtures. Red fescue and Cocksfoot were abundant on the Countryside Stewardship mixtures (Table 4 and Table 5). Perennial ryegrass established well and allowed very little incursion of other species, but a small population of ribwort plantain was found on the lower seedrate treatment (Table 5).

Table 4. *Plant species on 22 July 1993 (Domin scale)*

| Treatment<br>(seed mixture kg/ha) | Self-<br>heal | Field<br>horsetail | Crested<br>dog's-tail | Red<br>fescue | Smooth<br>meadow-grass |
|-----------------------------------|---------------|--------------------|-----------------------|---------------|------------------------|
| Emorsgate EM1 15 kg               | 3             | 0                  | 4                     | 4             | 2                      |
| Emorsgate EM1 36 kg               | 3             | 3                  | 4                     | 4             | 2                      |
| Emorsgate EM2 15 kg               | 3             | 0                  | 4                     | 5             | 2                      |
| Emorsgate EM2 36 kg               | 3             | 6                  | 4                     | 5             | 2                      |
| Countryside Stewardship 15 kg     | 0             | 7                  | 0                     | 7             | 2                      |
| Countryside Stewardship 36 kg     | 0             | 0                  | 0                     | 8             | 3                      |
| Perennial ryegrass 15 kg          | 0             | 0                  | 0                     | 0             | 0                      |
| Perennial ryegrass 36 kg          | 0             | 0                  | 0                     | 0             | 0                      |

Table 5. *Plant species on 22 July 1993 (Domin scale)*

| Treatment<br>(seed mixture kg/ha) | Perennial<br>ryegrass | Cocksfoot |
|-----------------------------------|-----------------------|-----------|
| Emorsgate EM1 15 kg               | 0                     | 0         |
| Emorsgate EM1 36 kg               | 0                     | 0         |
| Emorsgate EM2 15 kg               | 0                     | 0         |
| Emorsgate EM2 36 kg               | 0                     | 0         |
| Countryside Stewardship 15 kg     | 0                     | 7         |
| Countryside Stewardship 36 kg     | 0                     | 5         |
| Perennial ryegrass 15 kg          | 10                    | 0         |
| Perennial ryegrass 36 kg          | 10                    | 0         |

### Discussion and conclusions

All treatments resulted in a satisfactory biomass cover by the second autumn of the experiment, but the perennial ryegrass mixtures were much lower than the other treatments. The Emorsgate mixtures resulted in a varied composition of both broad-leaved and grass species and establishment was fairly rapid. Plant population on the Countryside Stewardship mixture included several broad-leaved species which were not sown and must therefore have been self-seeded. Establishment was satisfactory with both seedrates of the Emorsgate mixtures and the Countryside Stewardship mixture, suggesting that there was no advantage in using the higher seedrate to establish quicker ground cover. The lower seedrates on the Countryside Stewardship mixture allowed broad-leaved species to establish.

These observations suggest that both the Emorsgate and the Countryside Stewardship mixtures are useful for field margins and provide a varied composition of weed species. At Morley there was no evidence of some of the species which had been sown ie sweet vernal-grass and several broad-leaved species in the Emorsgate EM2 mixture suggesting that less complex seed mixtures might be more suitable on some sites.

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### References

Pack, R (1993). Personal Communication. Part of dissertation for BSc degree at Anglia Polytechnic University at Cambridge.

### Method

Plant species biomass scores used a 0 to 10 scale where 0 = no biomass or dead plants and 10 = dense and uniform plant cover. Plant species population assessments were carried out using the Domin scale (see below).

Table A1. *Domin Scale (subjective percentage cover)*

|                             |   |    |
|-----------------------------|---|----|
| Cover about 100%            | = | 10 |
| Cover about >75%            | = | 9  |
| Cover 50-75%                | = | 8  |
| Cover 33-50%                | = | 7  |
| Cover 25-33%                | = | 6  |
| Abundant, cover about 20%   | = | 5  |
| Abundant, cover about 5%    | = | 4  |
| Scattered, cover small      | = | 3  |
| Very scattered, cover small | = | 2  |
| Scarce cover small          | = | 1  |
| Isolated, cover small       | = | +  |