**Appendix 1.**Independent variables and interactions tested in each seasonal model 1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
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| --- | --- |
|  | Independent variables and interactions tested in each model |
| Dependent variable  | Year | Sward | N rate | Month | Year×Sward | Year×N rate | Sward × N rate | Sward×month | Month×N rate | Year × Sward × N rate | Month ×Sward ×N rate |
| Pre-grazing height | **0.221**2 | **0.363** | **<0.001** | **<0.001** | **<0.001** | 0.917 | **<0.05** | **<0.001** | **<0.001** | 0.995 | 0.623 |
| Post-grazing height  | **0.077** | **0.144** | **<0.001** | **<0.001** | **<0.05** | 0.142 | **<0.05** | **<0.01** | 0.370 | 0.969 | 1.000 |
|  Herbage removed yield  | **<0.01** | **<0.01** | **<0.001** | **<0.001** | **<0.01** | 0.711 | **<0.001** | **<0.001** | **<0.001** | 0.922 | 0.501 |
| Clover content  | **<0.001** | **-** | **<0.001** | **<0.001** | - | 0.909 | - | - | **<0.001** | - | - |
| Clover petiole length | **0.130** | **-** | **0.244** | **<0.001** | - | 0.994 | - | - | 0.778 | - | - |
| Clover stolon width  | **0.091** | **-** | **0.530** | **<0.001** | - | 0.842 | - | - | 0.673 | - | - |
| PRG tiller density  | **0.233** | **<0.01** | **<0.05** | **<0.001** | 0.674 | 0.278 | 0.750 | 0.067 | 0.890 | 0.813 | 0.963 |
| Clover stolon mass | **<0.001** | **-** | **<0.01** | **<0.01** | - | 0.554 | - | - | 0.353 | - | 0.663 |
| Unsown species density | **<0.01** | **0.06** | **<0.05** | **<0.01** | **<0.001** | 0.219 | **<0.05** | 0.178 | 0.301 | 0.129 | 0.181 |
| DM content | **<0.001** | **<0.001** | **<0.01** | **<0.001** | **<0.001** | 0.802 | **<0.001** | **<0.001** | **<0.001** | 0.767 | 0.483 |
| Organic matter digestibility  | **<0.001** | **<0.001** | **0.899** | **<0.001** | 0.998 | 0.731 | **<0.05** | **<0.01** | 0.933 | 0.863 | 0.991 |
| Crude protein  | **<0.001** | **<0.001** | **<0.001** | **<0.001** | 0.221 | 0.625 | **<0.001** | **<0.05** | **<0.001** | 0.404 | 0.267 |
| Neutral detergent fibre  | **<0.001** | **<0.05** | **<0.001** | **<0.001** | **<0.001** | 0.441 | **<0.01** | **<0.001** | 0.681 | 0.714 | 0.689 |
| Acid detergent fibre  | **<0.001** | **0.322** | **0.964** | **<0.001** | 0.419 | 0.311 | 0.830 | 0.152 | 0.983 | 0.631 | 0.956 |
| Ash  | **<0.001** | **0.343** | **<0.05** | **<0.001** | 0.140 | 0.798 | 0.931 | **<0.01** | 0.964 | 0.951 | 0.902 |

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PRG, perennial ryegrass; DM, dry matter.

1Interactions were checked independently for each independent variable and were removed from the model through backward elimination if they were not significant (*P* < 0.05).

2Bold effects were included in the final model used

**Appendix 2.**Independent variables and interactions tested in each annual model1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
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| --- | --- |
|  | Independent variables and interactions tested in the model |
| Dependent variable  | Year | Sward | N rate | Year×Sward | Year×N rate | Sward × N rate | Year × Sward × N rate |
| Pre-grazing height | **<0.01**2 | **0.268** | **<0.001** | **<0.001** | 0.856 | **0.11** | 0.954 |
| Post-grazing height  | **<0.001** | **0.184** | **<0.001** | **<0.05** | 0.471 | **0.05** | 0.942 |
|  Herbage removed yield  | **<0.001** | **<0.01** | **<0.001** | **<0.01** | 0.094 | **<0.05** | 0.594 |
| Clover content  | **<0.001** | **-** | **<0.05** | **-** | 0.914 | **-** | - |
| N response | **<0.001** | **0.195** | **0.456** | **0.170** | 0.141 | **0.903** | 0.62 |
| Clover petiole length | **<0.01** | **-** | **0.722** | **-** | 0.989 | **-** | - |
| Clover stolon width  | **0.221** | **-** | **0.239** | **-** | 0.999 | **-** | - |
| DM content | **<0.001** | **<0.01** | **<0.05** | **<0.001** | 0.467 | **<0.05** | 0.572 |
| Organic matter digestibility  | **<0.001** | **<0.01** | **0.568** | **0.972** | 0.378 | **0.232** | 0.954 |
| Crude protein  | **<0.001** | **<0.001** | **<0.05** | **0.304** | 0.301 | **<0.01** | 0.182 |
| Neutral detergent fibre  | **<0.001** | **<0.05** | **0.239** | **<0.05** | 0.534 | **0.18** | 0.754 |
| Acid detergent fibre  | **<0.001** | **0.213** | **0.896** | **0.31** | 0.242 | **0.863** | 0.461 |
| Ash  | **<0.001** | **0.139** | **0.402** | **<0.01** | 0.629 | **0.930** | 0.907 |

 |

DM, dry matter

1Interactions were checked independently for each independent variable and were removed from the model through backward elimination if they were not significant (*P* < 0.05).

2Bold effects were included in the final model used