|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Year | Cropping system | | R  (d−1) | | K  (t ha-1) | T  (50) | Imax  (kg ha-1 d-1) |
| Whole growth stage | | | | | | | |
| 2018 | Maize | M-Mo | | 0.064a | 33.0a | 96a | 525.5a |
| M-In | | 0.060b | 30.5b | 99b | 453.7b |
| NM-Mo | | 0.058c | 26.6c | 105c | 386.2c |
| NM-In | | 0.054d | 23.0d | 109d | 309.1d |
| Faba bean | M-Mo | | 0.064b | 16.6b | 67 b | 255.9b |
| M-In | | 0.069a | 17.9a | 62c | 308.2a |
| NM-Mo | | 0.052d | 12.0c | 75a | 156.0d |
| NM-In | | 0.054c | 14.3d | 74a | 193.6c |
| 2019 | Maize | M-Mo | | 0.067a | 32.4a | 92a | 548.6a |
| M-In | | 0.059b | 28.9b | 97b | 422.4b |
| NM-Mo | | 0.056c | 23.8c | 104c | 333.9c |
| NM-In | | 0.052d | 20.5d | 109d | 266.5d |
| Faba bean | M-Mo | | 0.067b | 16.4b | 70c | 274.4b |
| M-In | | 0.073a | 18.7a | 66d | 341.7a |
| NM-Mo | | 0.060c | 10.7d | 76a | 160.5d |
| NM-In | | 0.062d | 13.1c | 74b | 203.1c |
| Filling stage | | | | | | | |
| Year | Cropping system | | | R  (d−1) | K  (g p-1) | T  (50) | Imax  (g p-1 d-1) |
| 2018 | Maize | M-Mo | | 0.118a | 247.7a | 23a | 7.31a |
| M-In | | 0.113b | 229.4b | 25b | 6.48b |
| NM-Mo | | 0.110c | 188.8c | 26c | 5.19c |
| NM-In | | 0.108c | 158.9d | 28d | 4.29d |
| 2019 | M-Mo | | 0.116a | 244.4a | 24a | 7.09a |
| M-In | | 0.115b | 221.7b | 26b | 6.37b |
| NM-Mo | | 0.113c | 186.5c | 27c | 5.27c |
| NM-In | | 0.107d | 153.4d | 29d | 4.10d |

Table 1 Parameters estimated from fitting logistic growth curves to maize and faba bean biomass accumulation and grain accumulation in relation to cropping treatments and film mulching.

Note: R (d−1) is the initial growth rate, K (t ha−1) is the asymptotic maximum biomass, t50 (d) is time of maximum instantaneous rate, Imax (kg ha−1 d−1) is the maximum instantaneous growth rate. The same letter within each column are not significantly different between all treatments (one-way ANOVA, P<0.05)

Table 2 Different performances of yield formation components and remobilization ability in relation to cropping treatments and film mulching in 2018-2019.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year | Treatments | Total  DTA  (kg ha-1) | TotalDTR  (%) | Total  GCR  (%) | Bald tip  length (cm) | Floret Number  per plant | Visible Silks | Final Kernel number per ear | | Loss1  % | Loss2  % | Kernel  abortion  % | Kernel  weight (g) | Grain yield  (kg ha−1) |
| 2018 | M-Mo | 5995a | 31.3a | 40.2a | 0.9c | 823a | 697a | 636a | 15.3b | | 8.7c | 24.0d | 238.1a | 14887.4a |
| M-In | 4606b | 26.6b | 34.8b | 1.7b | 831a | 701a | 610b | 15.6b | | 12.9b | 28.6c | 208.7b | 12920.7b |
| NM-Mo | 3656c | 23.7c | 34.5b | 2.0b | 809b | 661b | 571c | 18.2a | | 13.6b | 31.8b | 180.2c | 11554.3c |
| NM-In | 2584d | 18.3d | 28.5c | 2.9a | 794b | 650b | 542d | 18.1a | | 16.6a | 34.8a | 156.1d | 9723.7d |
| 2019 | M-Mo | 4955a | 24.8a | 34.2a | 1.2c | 842a | 708a | 632a | 15.9b | | 10.7c | 26.6c | 236.7a | 14819.6a |
| M-In | 3884b | 21.3b | 30.1b | 1.9b | 835a | 696b | 602b | 16.6b | | 13.5b | 30.1b | 213.2b | 13322.3b |
| NM-Mo | 3226c | 19.7c | 27.7c | 2.1b | 795b | 652c | 571c | 18.0a | | 12.4bc | 30.4b | 171.6c | 10685.8c |
| NM-In | 2258d | 15.3d | 22.5d | 2.8a | 745c | 607d | 502d | 18.5a | | 17.3a | 35.8a | 148.2d | 9217.5d |
| Sig. |  |  |  |  |  |  |  |  |  | |  |  |  |  |
|  | M | \*\*\* | \*\*\* | \*\*\* | \*\* | \*\*\* | \*\*\* | \*\*\* | \*\*\* | | \*\* | \*\*\* | \*\*\* | \*\*\* |
|  | C | \*\*\* | \*\*\* | \*\*\* | \*\*\* | \* | \* | \*\*\* | ns | | \*\*\* | \*\*\* | \*\*\* | \*\*\* |
|  | M×C | ns | \*\* | \* | \*\* | \*\* | ns | \*\* | ns | | \* | \* | \*\* | \*\*\* |

Notes: Means within a column followed by the same lowercase letter and capital letter show that there is no significant difference at 0.05 level. \*, \*\*, and \*\*\* means significant differences at p <0.05, p <0.01, and p <0.001, respectively. DTA is transportation amount of dry matter in vegetative organ (kg); DTR is transfer rate of dry matter in vegetative organ (%); GCR is contribution rate of vegetative organs in grain (%); Loss1: percent loss of kernel number due to silk reduction (Loss1 = (florets minus visible silks)/florets); Loss2: percent loss of kernel number due to kernel abortion (Loss 2 = (visible silks minus final kernel number per plant)/visible silks).