Effects of different sized herbivores on aboveground plant biomass in Swiss subalpine grasslands

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Abstract

Herbivores are known to affect grassland properties such as soil characteristics, plant composition or vegetation biomass through grazing, trampling and nutrient reallocation. Consequently, herbivores can alter quality and quantity of forage resources. They can, for example, decrease biomass or improve forage quality. So far, researches on how herbivores influence plant biomass have delivered contrasting results. It has been suggested that ecosystem productivity, as well as grazing intensity, influence how herbivores affect vegetation. Grazing intensity correlates with body size, with larger herbivores consuming more plant biomass. In this study we analysed the impact of four different sized herbivore groups on aboveground plant biomass using an exclosure set-up in Swiss subalpine grasslands of differing productivity (nutrient-rich short-grass and nutrient-poor tall-grass). We subsequently excluded ungulates, marmots and hares, small sized mammals and insects and determined aboveground plant biomass using the canopy intercept method. We found that exclusion of ungulates as well as of insects resulted in an increase of plant biomass in nutrient-rich short-grass. The exclusion of marmots and hares and of small sized mammals did not result in an additional increase of plant biomass. In nutrient-poor tall-grass no effects of herbivores on biomass were found. Our results demonstrate that ecosystem productivity, as well as different herbivores species, can determine herbivores' influence on the vegetation.

Introduction

Grasslands cover around 41 % of Earth's surface (White et al. 2000) and support numerous herbivores, ranging from large ungulates to smaller mammals and insects (Gibson 2009). Herbivores, in turn, are known to have strong influence on ecosystem properties on all trophic levels. One response of plants to grazing is to exudate carbon through roots into the soil (Bardgett & Wardle 2003). This can affect soil microbial communities, which are responsible for decomposition and mineralization of nutrients for plants (Bardgett et al. 1998, Wardle et al. 2004). In addition, faeces and urine from large herbivores have been shown to accelerate nutrient cycling and, consequently, to stimulate plant growth (Ruess & McNaughton 1988, Bardgett et al. 1998, Wardle et al. 2004). Also, abiotic soil characteristics can change under grazing. Through changes in vegetation canopy structure light availability at the soil surface, soil temperature and soil moisture can be negatively or positively affected (Frank & McNaughton 1993, Frank et al. 2002, Hunter 2001). This again, can have a feedback on plant growth and plant community composition (Flanagan & Johnson 2005) and therefore affect forage resources for herbivores.

Many studies have analysed herbivore impact on grassland ecosystems with, however, contradicting results. While some authors report increases in biomass when herbivores are excluded (Hill 1992, Chase et al. 2000, Carson & Root 1999, McIntire & Hik 2005, Jacobs & Naiman 2008, Wesche et al. 2010), others find the opposite (Paige & Whitham 1987, Belovsky & Slade 2000) or no change at all (Gibson et al. 1990, Bakker et al. 2004, del-Val & Crawley 2005). Possible reasons for these contradicting results have been suggested to be differences in ecosystem productivities (Proulx & Mazumder 1998, Olofsson et al. 2002, Wardle et al. 2004, Bakker et al. 2009) or grazing intensities (Hobbs 1996). In nutrient-poor grasslands plants compete for nutrients (Tilman 1985) whereas in nutrient-rich systems, the competition for light is a stronger driver of biomass production. Grazing intensity is usually high in nutrient-rich compared to nutrient-poor grasslands (Edenius 1993, Jefferies et al. 1994), which leads to different responses in the two systems with regard to, for example, functional and physiological composition of the vegetation, plant production, litter quality, and soil fertility (Bardgett et al. 1998, Wardle et al.

2004). However, grazing intensity depends not only on the mere number of herbivores, but also on their consumption rate, which is thought to correlate positively with body size (Hobbs 1996, Bakker et al. 2006, 2009). Therefore, larger herbivores should have a larger impact on total plant biomass due to the larger amount they ingest compared to smaller animals. These smaller herbivores, however, have also been shown to have a substantial influence on vegetation, since, as selective feeders they ingest high quality plants or plant parts (del-Val & Crawley 2005, Chase 1998). Consequently, their impact on vegetation is not only defined by the quantity of grazed vegetation, but also which parts of plants they ingest.

In most grassland ecosystems several herbivore species coexist and therefore can influence one another. However, most of the studies investigating interactions between herbivores and vegetation limit their analysis to one or two herbivore species or groups of the same body size (Coppock et al. 1983, Gibson et al. 1990, Carson & Root 1999, McIntire & Hik 2005, Jacobs & Naiman 2008, Bakker et al. 2009). Those that included several herbivore groups conducted their study on one ecosystem productivity level only (Hulme 1996, Bakker et al. 2004, del-Val & Crawley 2005). In contrast, we analysed the influence of four different sized herbivore groups on plant biomass in nutrient-rich short-grass and nutrient-poor tall-grass vegetation in Swiss subalpine grasslands. As ungulates prefer to graze on nutrient-rich short-grass (Schütz et al. 2003, 2006), we expected pronounced changes in this vegetation type. We hypothesized that ungulates would have a large impact on short-grass vegetation, reducing plant biomass due to the large amount ingested, whereas little or no impact on tall-grass vegetation. Smaller herbivores would affect plant biomass less since they do not ingest as much biomass as ungulates. However, we expected them to have a larger impact in short-grass than in tall-grass vegetation as well.

Methods

Study area

The Swiss National Park (SNP) is located in the Central Alps in the south-eastern part of Switzerland. It covers a total area of 172 km^2, of which 83 km^2 are covered with vegetation. The vegetation consists of 3 km^2 subalpine grasslands, 36 km^2 alpine grasslands and 47 km^2 forest (Schütz et al. 2006). The elevation ranges from 1400 to 3174 m a.s.l. (Schütz et al. 2006) and mean annual precipitation and temperature are 871 ± 156 mm and 0.6 ± 0.6 °C, respectively (mean ± SD), measured between 1960 and 2009 at the nearby weather station located in Buffalora at 1980 m a.s.l. (MeteoSwiss 2011). Since the Park's foundation in 1914 all hunting, logging and agricultural activities have ceased (Achermann 2000) and the only human activities are soft tourism and research.

Experimental design

Before the park was founded, subalpine grasslands were used as pastures for domestic livestock. This affected soil nutrients and plant compositions at different sites (Schütz et al. 2003, 2006). In the areas where cattle rested nutrient-rich short-grass is present today. This vegetation type is dominated by red fescue (*Festuca rubra* L.), perennial quaking grass (*Briza media* L.) and milfoil (*Achillea millefolium* L.). In contrast, nutrient-poor tall-grass areas are found where cattle grazed but not rested. This vegetation type is dominated by evergreen sedge (*Carex sempervirens* Vill.), mat-grass (*Nardus stricta* L.) and Bellard's Kobresia (*Elyna myosuroides* (Vill.) Fritsch). Vegetation height and biomass are both higher in tall-grass than in short-grass (Schütz et al. 2006). Today, wild ungulates preferably graze on short-grass vegetation, whereas tall-grass is is less prefered as grazing sites (Schütz et al. 2006).

In our study we assessed the influence of four groups of herbivores of different body size on aboveground plant biomass: Large vertebrate herbivores were red deer (*Cervus elaphus* L.) and chamois (*Rupicapra rupicapra* L.), medium sized marmots (*Marmota marmota* L.) and hares (*Lepus timidus* L.), and small mammals were several species of mice and voles. The smallest group of herbivores present were invertebrates, mainly grasshoppers, caterpillars and cicadas. Red deer use the SNP as their summer range between May and October and leave the park during winter (Thiel-Egenter et al. 2007), while all the other species do not migrate between summer and winter range.

Six grasslands were selected for the experiment based on the presence of all herbivore groups and occurrence of both short-grass and tall-grass vegetation. In total, 18 replicate sites were distributed on these grasslands, always paired in short-grass and tall-grass vegetation (Table 1).

Table 1: Overview of the 18 sites distributed among six grasslands in two different vegetation types and their respective elevation.

Site number	Grassland	Vegetation type	Elevation (m a.s.l.)
1	Alp Stabelchod	Short-grass	1975
2	Alp Stabelchod	Tall-grass	1981
3	Alp Stabelchod	Short-grass	1980
4	Alp Stabelchod	Tall-grass	1986
5	Stabelchod Dadaint	Short-grass	2133
6	Stabelchod Dadaint	Tall-grass	2140
7	Margunet	Short-grass	2275
8	Margunet	Tall-grass	2299
9	Val dal Botsch	Short-grass	2091
10	Val dal Botsch	Tall-grass	2075
11	Alp Grimmels	Short-grass	2032
12	Alp Grimmels	Tall-grass	2060
13	Alp Grimmels	Short-grass	2079
14	Alp Grimmels	Tall-grass	2112
15	Alp Mingèr	Short-grass	2170
16	Alp Mingèr	Tall-grass	2176
17	Alp Mingèr	Short-grass	2181
18	Alp Mingèr	Tall-grass	2162

For the gradual exclosure of the four herbivore groups we built fences with different mesh sizes at each site. The ungulate exclosure (7 x 9 m) was built with 10 x 10 cm wooden posts and electrical tape (20 mm width; AGRARO ECO, Landi, Bern, Switzerland) at 0.5 m, 0.7 m, 0.95 m, 1.2 m, 1.5 m and 2.1 m height. The fence was powered by a solar panel (AGRARO Sunpower S250, Landi, Bern, Switzerland). The lowest tape at 0.5 m height was not connected to the power to ensure that smaller mammals could enter safely. This main fence surrounded the four exclosure plots (2 x 3 m; Figure 1), each containing six 1-m^2 subplots, designated for different measurements. The marmot exclosure was built with 10 plastic posts surrounded by a sheep fence with a mesh size 10 x 10 cm (AGRARO Weidezaunnetz ECO, Landi, Bern, Switzerland) that was also hooked up to the solar panel. For the mouse exclosure a metal wire (mesh size 2 x 2 cm; Hortima AG, Hausen, Schweiz) was used. The insect exclosure was sealed completely on the sides as well as the top using mosquito net (mesh size 1.5 x 2 mm; Sala Ferramenta AG, Biasca, Switzerland), supported by wooden posts and a wooden frame for the roof at 0.8 m height. After taking measurements in the insect exclosure an insecticide was applied if necessary (biokill, Doetsch Grether AG, Switzerland). Outside of the main fence we established a control plot (2 x 3 m) where all animals could graze freely. Fences were established after snowmelt in May and were taken down in October to prevent damage through

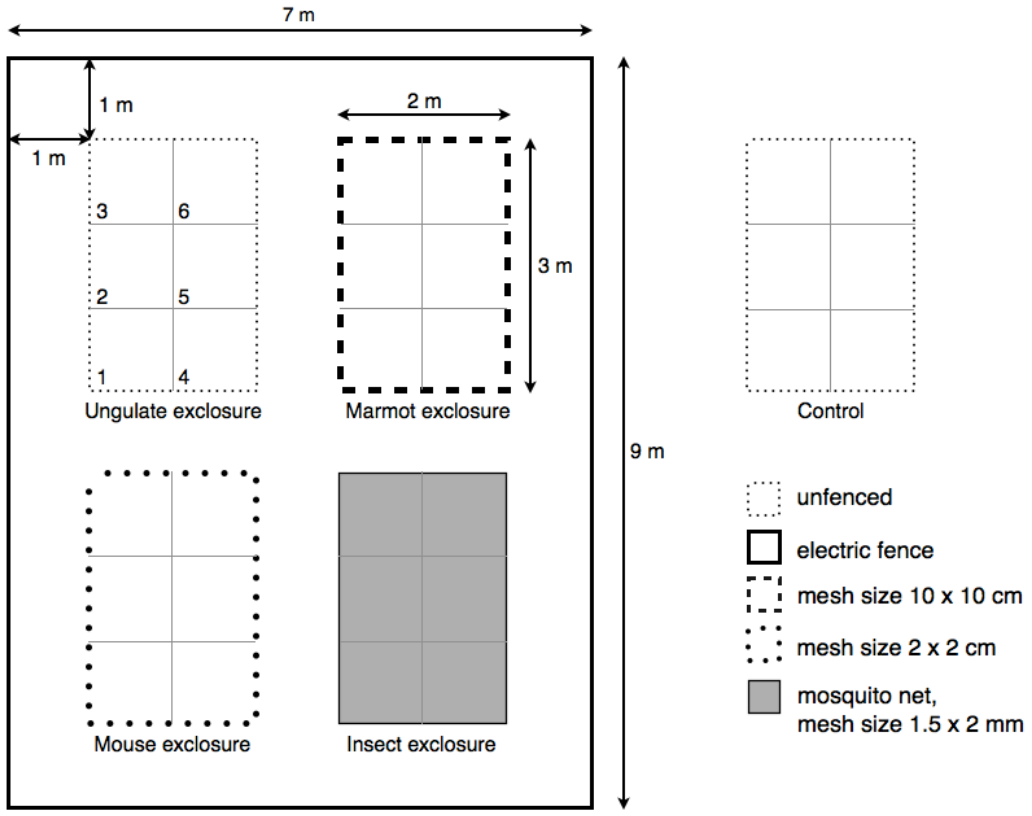

Figure 1: Schematic representation of the experimental design with four exclosure treatments and one control. Each treatment was enclosed with a different meshed fence, allowing the smaller herbivores to enter the exclosure. In the insect exclosure no animals were able to enter at all. Within each treatment six subplots were designated for different measurements (Subplot 1: aboveground plant biomass; Subplot 6: abiotic measurements; remaining subplots: other measurements).

snow. By this time herbivores were usually not present or active any more, so grazing was negligible over winter. Henceforth, each exclosure treatment is named by the herbivore group that it excluded, allowing the smaller herbivores to enter. Thus, the "ungulate exclosure" allowed marmots, mice and insects to graze. In the "marmot exclosure" mice and insects could graze and in the "mouse exclosure" only insects could feed on. In the "insect exclosure" no herbivores could feed on the vegetation.

Biomass sampling

Aboveground plant biomass was measured during the peak of standing vegetation using the canopy intercept method (Jonasson 1988, Frank & McNaughton 1990). Its advantage compared to other methods, such as clipping, is the non-destructive procedure, which allows performing repeated measures on the same area. The canopy intercept method relates the biomass to the number of contacts a pin makes when passed through the vegetation. Our sampling frame consisted of a 1 m long wooden bar with holes every 2 cm, where the pin could be passed. Two metal legs on each side supported the wooden bar. The pins were inserted into the vegetation at an angle of 45°, which is the angle yielding best results (Warren Wilson 1960). The pin was passed through the wooden bar on five randomly selected holes before moving the frame 10 cm to the next strip. On each of the ten strips, different random numbers were used. In total, 50 pins were inserted on an area of 1 m^2. This amount of pins per area is above the least recommended one by Brathen et al. (2004), which is 40 pins/m^2.

First a calibration model had to be established allowing calculations of biomass based on the number of touched leaves (Schütz et al. unpublished data). For this, biomass was assessed with the canopy intercept method on reference areas at each grassland. Afterwards, the biomass was clipped to soil surface. For shrubs only current year growth was clipped (Bakker et al. 2006). The collected biomass was dried for 48 h at 65°C to constant weight and weighed to determine dry biomass (g/m^2). For the calibration model a linear regression of biomass on the number of leaves was performed. Beforehand, hits for narrow-leaved plants (*Elyna myosuroides* Vill., *Festuca ovina* L., *F. rubra* L. and *Nardus stricta* L.) were adjusted by reducing them to half to account for their low biomass. As a result, the following equation for calculating biomass was obtained:

$$\text{Aboveground plant biomass} = 2.517 \times (\text{adjusted number of leaves}) - 37.712$$

For our measurements we used the canopy intercept method on a 1 x 1 m subplot in each treatment of each site, resulting in a total of 90 subplots. The same subplots were used in both years. Calibration model and biomass data for 2009 were provided by Schütz et al. (unpublished data) and Stoffel (2010).

Data analyses

To analyse the impact of herbivores on biomass, a three-way repeated measures ANOVA based on a linear mixed model was performed. Fixed factors were exclosure treatment (control, ungulate, marmot, mouse, insect exclosures), vegetation type (short-grass, tall-grass) and year (2009, 2010) and plant biomass was the dependent variable. Additionally, site nested within vegetation type was included as a random effect. Plant biomass data was squared-root transformed to meet homogeneity of variances criteria and a normal distribution. The significance level was $\alpha = 0.05$ for all analyses. For pairwise comparisons of treatment levels the least significant difference (LSD) method within the linear mixed model was chosen since it computed the smallest confidence band. This analysis was made separately for short-grass and tall-grass. Spearman rank correlation test was used to examine the relationship between biomass and exclosure treatments, separated by years and vegetation types.

To analyse changes in plant species between the two years in regard to the different treatment levels, one-way ANOVAs were performed on all plant species individually. The dependent variable was the difference in pin count hits between the two years and the independent variable was the exclosure treatment. The calculated differences of pin count hits were either log-transformed or squared-root transformed to meet normal distribution. A pairwise comparison of treatment levels was performed using the LSD method. The analyses were conducted separately for short-grass and tall-grass. All analysis were performed with IBM® SPSS® Statistics 19.

Results

Our experiment revealed significant differences in mean aboveground biomass between the two years, the different vegetation types as well as the exclusion of herbivores (Table 2). However, no interactions were found between any of the fixed factors.

Mean aboveground plant biomass was significantly higher in 2010 compared to 2009 ($F_{1,89}$ = 95.95, p < 0.001, Figure 2, Table 2). In 2009, mean biomass over all treatments was 371 ± 15.4 g/m^2 (mean ± SE throughout the study; n = 90); in 2010 the mean value was 529 ± 22.1 g/m^2 (n = 90). The lowest biomass over both years was 90 g/m^2 and the highest was 1015 g/m^2. Mean biomass was significantly higher in tall-grass (485 ± 20.5 g/m^2, n = 90) than in short-grass (415 ± 20.4 g/m^2, n = 90; $F_{1,84}$ = 3.96, p = 0.05). Further analyses were separated by vegetation type to have a better understanding of herbivores' influence on the different vegetation types.

Table 2: Results of a repeated measures ANOVA of the effects of exclosure treatment, vegetation type and year on square-root transformed aboveground plant biomass. Data was note separated by any category; n = 90.

	d.f.	F	*p*-value
Exclosure treatment	4,83.7	5.02	0.001
Vegetation type	1,83.7	3.96	0.050
Year	1,83.7	95.95	< 0.001
Exclosure treatment x vegetation type	4,80	1.89	0.120
Exclosure treatment x year	4,80	1.10	0.361
Vegetation type x year	1,80	3.30	0.073
Exclosure treatment x vegetation type x year	4,80	0.26	0.906

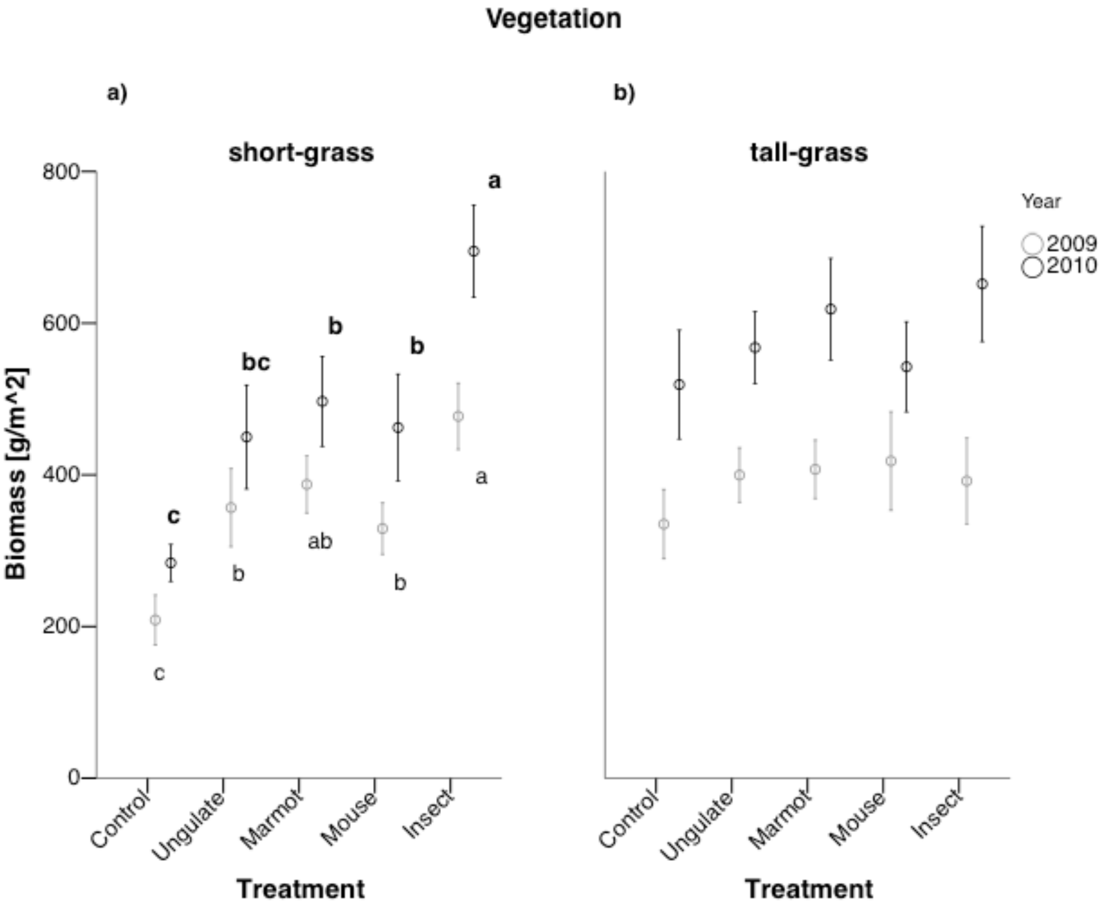

Figure 2: Mean aboveground plant biomass (g/m^2) for single exclosure treatments in a) short-grass and b) tall-grass for both years individually. Error bars show SE, each vegetation type: n = 45. Different letters indicate significant differences between treatments, separated by years (LSD, $p < 0.05$); bold font is for 2010, normal font for 2009. In tall-grass no significant differences between treatments were found.

Exclusion of herbivores had a highly significant influence on short-grass vegetation ($F_{4,40} = 7.23$, $p < 0.001$, n = 45). Spearman rank correlation test confirmed that the more herbivore groups were excluded, the more plant biomass was found regardless of the year of sampling (2009: $r_S = 0.524$, $p < 0.001$, n = 45; 2010: $r_S = 0.538$, $p < 0.001$, n = 45). For short-grass vegetation in the year 2009, pairwise comparisons of single treatment levels revealed that biomass was significantly lower in control plots than in all other treatments (Figure 2a). Also, biomass in the insect exclosures was higher than in mouse exclosures and in ungulate exclosures. In the second year, these relationships changed slightly. Plant biomass in the control plots was no longer significantly lower than in ungulate exclosures, but still differed from all the other exclosures. Insect exclosures had significantly more biomass than all the other treatments. In contrast, in tall-grass vegetation the exclosure treatments had no significant effect on plant biomass at all ($F_{4,40} = 0.52$, $p = 0.721$, n = 45, Figure 2b) and there were no significant differences between single treatment levels. Spearman rank correlation confirmed that there was no correlation between biomass and exclosure treatments (2009: $r_S = 0.072$, $p = 0.638$, n = 45; 2010: $r_S = 0.133$, $p = 0.383$, n = 45). Regarding the changes in plant species, no significant results were found between the two years in either vegetation type. Also, among the treatment levels, there were no significant differences in plant species occurrences.

Discussion

Differences in aboveground biomass between years

In the second year of herbivore exclosure, biomass was higher compared to the first year. Other studies have found inter-annual differences in biomass as well (e.g. Deshmukha 1984, Wang et al. 2003, Flanagan & Johnson 2005, Retzer et al. 2006). They attributed the change in biomass to differences in the total amount of precipitation. Measurements from a nearby weather station (Buffalora, 1970 m a.s.l.) showed that 2010 was a wetter year, especially during the summer (244 mm vs. 399 mm; MeteoSchweiz 2011). This could explain the general increase in biomass in our experiment in the second year since biomass also increased in control plots.

Differences in aboveground biomass between herbivore exclosures in the two different vegetation types

Plant biomass was higher in tall-grass compared in short-grass vegetation. This concurs with the findings of Schütz et al. (2006), who showed that in the SNP red deer consume higher amounts of biomass in short-grass than in tall-grass and that short-grass produces less biomass, resulting in a lower total biomass in the latter vegetation type.

In our study the greatest changes in biomass in short-grass were when ungulates and when insects were excluded, while exclosure of marmots and mice did not have any additional effect on biomass production. This increase in biomass in ungulate exclusion corresponds to findings of others studies (Ritchie et al. 1998, Jacobs & Naiman 2008, Wesche et al. 2010). Ritchie et al. (1998) and Jacobs & Naiman (2008) explained this biomass increase with fast-growing grasses that outcompeted other species and shaded them out. Other studies found no change in biomass between grazing treatments (compensation; Bakker et al. 2004) or even higher biomass when ungulates were present (overcompensation; Paige & Whitham 1987, Belovsky & Slade 2000, Olofsson et al. 2001, 2007). They explained the (over-) compensatory effects of grazing on biomass with the nitrogen input through dung and urine. However, Frank et al. (2002) and Belsky et al. (1993) stated that plant overcompensation after being grazed can likely only occur when ungulates are migratory and plants can recover from grazing over a longer time-span. Since grasslands in SNP are continuously grazed during the vegetation period (Thiel-Egenter et al. 2007), plants do not have the possibility to regrow completely after being grazed unless they are protected from herbivores.

Insect exclosure also had a major positive effect on biomass in short-grass, which became even more pronounced in the second year. Comparing the insect exclosure, where no herbivores grazed at all, to the mouse exclosure, where only insects fed on, the biomass increased by 48 %. This value is much higher than the biomass grazed by grasshoppers in an Alpine grassland reported by Blumer & Diemer (1996), which was between 19 and 30 %. However, in our study site insect herbivores did not only consist of grasshoppers, but also of cicadas, caterpillars and many other species, which could account for the additional biomass removal. Some studies have found an increased biomass in insect exclusion as well (Henderson & Clements 1977, Blackshaw 1984). Others did not find any effect of insect exclusion on total biomass (Gibson et al. 1990, Hulme 1996, del-Val & Crawley 2005, Blue et al. 2011), but found increases in a few plant species when insects were excluded. This, however, had no effect on the total biomass. However, in our experiment we did not find such a pattern among treatment levels. The increase in biomass in our experiment probably was due to the general increase of plant growth rather than only certain plant species. In spite of the different results from previous studies, the authors explained the effect of insects on biomass reduction with the mere removal of plant biomass and the missing ability of plants to compensate for this tissue loss. In our experiment, short-grass vegetation seemed to be undercompensated when were present, especially when ungulates and insects grazed. As soon as short-grass vegetation was released from herbivore pressure, the vegetation could recover from depletion and regrow. It might even change into a tall-growing vegetation after a longer time-span. This would be similar to what Andresen et al. (1990), van Wijnen et al. (1997) and Kuijper et al. (2008) have shown. They explained this change to taller vegetation by an increase of dominant plant species that are good light competitors. When their predators were removed, they were able to outcompete other plant species and grow exceedingly.

The exclusion of marmots and mice did not change biomass significantly. While some studies reported no changes in biomass when small mammals were excluded (Hulme 1996), other did find a significant increase (Gough & Grace 1998, Howe & Brown 1999, McIntire & Hik 2005, Kuijper et al. 2008). They also explained the increase in biomass in the chance of regrowing after herbivores were removed. However, changes can be visible after several years only (Hulme 1996) what could explain the missing effect of small mammals on biomass in our experiment up to the present. The continuation of the experiment might deliver more results.

While in short-grass the plant biomass increased when herbivores were removed, herbivores did not seem to affect biomass in tall-grass at all. The recorded densities of grasshoppers (Spalinger 2011) and marmots (Haynes et al., unpublished data) were similar in both vegetation types but we have no record of their forage preferences. Ungulates, on the contrary, are known to prefer short-grass vegetation to forage (Schütz et al. 2003, 2006, Thiel-Egenter et al. 2007). The missing effect in tall-grass can therefore be caused by a lower grazing intensity than in short-grass .

In this study we showed that different groups of herbivores can have different effects on aboveground plant biomass. Especially ungulates and insects seemed to reduce plant biomass in nutrient-rich short-grass. When conducting studies on herbivores effects on vegetation one should consider the vegetation type and its grazing history, since it can yield different results. In our study we found no effects of herbivores on plant biomass in nutrient-poor tall-grass, but large herbivore impact in nutrient-rich short-grass. The observed changes in biomass in short-grass suggest that vegetation has been heavily grazed but could recover quickly after herbivores were removed. Nevertheless, vegetation should be monitored over a longer time span to observe if these changes persist and if other herbivore groups, such as marmots and mice, will affect biomass as well.

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Appendix

Appendix A: Results of a Spearman's rank correlation test of plant biomass and treatments, separated by years and vegetation types.

Vegetation type	Year	Spearman's rho	*p*
Short-grass	2009	0.524	< 0.001
	2010	0.538	< 0.001
Tall-grass	2009	0.072	0.638
	2010	0.133	0.383

Appendix B: Results of the pairwise comparisons of treatment levels using the least significant difference (LSD) method. The analysis was computed separately for the two vegetation types and the two years. Values represent *p*-values. Significant results are marked with an asterisk.

	Short-grass 2009				Short-grass 2010			
	Control	Ungulate	Marmot	Mouse	Control	Ungulate	Marmot	Mouse
Ungulate	0.007*				0.057			
Marmot	0.001*	0.531			0.012*	0.513		
Mouse	0.017*	0.720	0.326		0.037*	0.840	0.650	
Insect	0.000*	0.046*	0.160	0.020*	0.000*	0.008*	0.040*	0.013*

	Tall-grass 2009				Tall-grass 2010			
	Control	Ungulate	Marmot	Mouse	Control	Ungulate	Marmot	Mouse
Ungulate	0.292				0.491			
Marmot	0.254	0.930			0.264	0.665		
Mouse	0.254	0.929	0.999		0.713	0.747	0.450	
Insect	0.406	0.820	0.753	0.752	0.158	0.461	0.760	0.291

Appendix C: Raw data of biomass sampling using the canopy intercept method and abbreviations used on the table.

Treat = Treatment: 1 = Control; 2 = Ungulate; 3 = Marmot; 4 = Mouse; 5 = Insect

Year: 1 = 2009; 2 = 2010

Plant species abbreviations:

Ach.mil	Achillea millefolium
Aci.alp	Acinos alpinus
Aco.nap	Aconitum napellus
Agr.cap	Agrostis capillaris
Alc.xan	Alchemilla xanthochlora
And.cha	Androsace chamaejasme
Ant.dio	Antennaria dioica
Ant.vul	Anthyllis vulneraria
Ant.odo	Anthoxanthum odoratum
Ara.alp	Arabis alpina
Ara.cil	Arabis ciliata
Ast.bel	Aster bellidiastrum
Bar.alp	Bartsia alpina
Bis.lae	Biscutella laevigata
Bot.lun	Botrychium lunaria
Bri.med	Briza media
Cam.sch	Campanula scheuchzeri
Car.def	Carduus defloratus
Car.atr	Carex atrata
Car.cap	Carex capillaris
Car.car	Carex caryophyllea
Car.fla	Carex flacca
Car.orn	Carex ornithopoda
Car.sem	Carex sempervirens
Car.aca	Carlina acaulis
Car.car	Carum carvi
Cer.arv	Cerastium arvense
Cer.fon	Cerastium fontanum
Chr.alt	Chrysosplenium alternifolia
Cir.aca	Cirsium acaule
Cre.alp	Crepis alpestris
Cre.aur	Crepis aurea
Cus.	Cusuta
Dap.str	Daphne striata
Des.cae	Deschampsia caespitosa
Dry.oct	Dryas ocotpetala
Ely.myo	Elyna myosuroides
Eri.car	Erica carnea
Eri.uni	Erigeron uniflorus
Eri.alp	Erigeron alpinus
Eup.min	Euphrasia minima
Eup.mon	Euphrasia montana
Fes.ovi	Festuca ovina
Fes.rub	Festuca rubra
Gal.pum	Galium pumilum
Gal.ver	Galium verum
Gen.cam	Gentiana campestris
Gen.cil	Gentiana ciliata
Gen.niv	Gentiana nivalis
Gen.ver	Gentiana verna
Ger.sil	Geranium silvaticum
Geu.mon	Geum montanum
Hel.alp	Helianthemum alpestre
Hel.num	Helianthemum nummularium
Hel.pub	Helictotrichon pubescens
Hie.bif	Hieracium bifidum
Hie.lac	Hieracium lactucella
Hie.pil	Hieracium pilosella
Hip.com	Hippocrepis comosa
Hom.alp	Homogyne alpina
Koe.pyr	Koeleria pyramidata
Leo.his	Leontodon hispidus
Leu.vul	Leucanthemum vulgare
Lot.cor	Lotus corniculatus
Luz.mul	Luzula multiflora
Med.lup	Medicago lupulina
Mel.pra	Melamphyrum pratense
Min.ver	Minuartia verna
Myo.alp	Myosotis alpestris
Nar.str	Nardus stricta
Par.pal	Parnassia palustris
Phl.alp	Phleum alpinum
Phy.orb	Phyteuma orbiculare
Pla.alp	Plantago alpina
Pla.atr	Plantago atrata
Pla.med	Plantago media

Poa.alp	Poa alpina
Poa.ann	Poa annua
Pol.alp	Polygala alpestris
Pol.cha	Polygala chamaebuxus
Pol.viv	Polygonum viviparum
Pot.aur	Potentilla aurea
Pot.cra	Potentilla crantzii
Pot.ere	Potentilla erecta
Pri.far	Primula farinosa
Pru.vul	Prunella vulgaris
Pul.ver	Pulsatilla vernalis
Ran.acr	Ranunculus acris
Ran.alp	Ranunculus alpestris
Ran.mon	Ranunculus montanus
Sal.her	Salix herbacea
Sal.ser	Salix serpyllifolia
San.min	Sanguisorba minor
Sca.luc	Scabiosa lucida
Sel.sel	Selaginella selaginoides
Sem.tec	Sempervivum tectorum
Sen.abr	Senecio abrotanifolius
Ses.cae	Sesleria caerulea
Sib.pro	Sibbaldia procumbens
Sil.aca	Silene acaulis
Sil.nut	Silene nutans
Sol.alp	Soldanella alpina
Tar.off	Taraxacum officinale
Tha.alp	Thalictrum alpinum
The.alp	Thesium alpinum
Thy.ser	Thymus serpyllum
Tri.pum	Trichophorum pumilum
Tri.bad	Trifolium badium
Tri.pra	Trifolium pratense
Tri.rep	Trifolium repens
Tri.fla	Trisetum flavescens
Ver.aph	Veronica aphylla
Ver.cha	Veronica chaemedrys
Ver.off	Veronica officinalis
Ver.ser	Veronica serpyllifolia
Ver.aph	Veronica aphylla
Vio.bif	Viola biflora
Vio.cal	Viola calcarata
Vio.rup	Viola rupestris

Fence	Treat	Year	Ach.mil	Aci.alp	Aco.nap	Agr.cap	Alc.xan	And.cha	Ant.dio	Ant.vul	Ant.odo	Ara.alp	Ara.cil	Ast.bel	Bar.alp	Bis.lae	Bot.lun
1	1	1	1				2										
1	2	1					2										
1	3	1	1				2										
1	4	1					2										
1	5	1	2				6										
2	1	1	1														
2	2	1															
2	3	1	3														
2	4	1	6														
2	5	1	11														
3	1	1	1							3							
3	2	1	2				2										
3	3	1	1				3										
3	4	1	10										2				
3	5	1	3				2										
4	1	1					1	5									
4	2	1															
4	3	1	7														
4	4	1	3														
4	5	1	5														
5	1	1	1			14	3										
5	2	1	10			41	3										
5	3	1	2			139	5										
5	4	1	9			86	1										
5	5	1	1			84	5										
6	1	1					2										
6	2	1	5														
6	3	1	3														
6	4	1								11							
6	5	1	2														
7	1	1								9				2		1	
7	2	1				6				13				1			
7	3	1								13				5			
7	4	1								5							
7	5	1				2				8							
8	1	1	7			7											
8	2	1	9			40	4										
8	3	1	3			51	2										
8	4	1	2			101											
8	5	1	6							5							
9	1	1		2													
9	2	1	3	1		3	4										
9	3	1															
9	4	1	2										1				
9	5	1		2		1				1							
10	1	1	1														
10	2	1															
10	3	1	2				13										
10	4	1					8										
10	5	1	2														
11	1	1	7														
11	2	1	11										1				
11	3	1	6				5										1
11	4	1											2				
11	5	1	40			16											
12	1	1	4			1											
12	2	1	2				2						1				
12	3	1	2				7		10								
12	4	1	5			7	1										
12	5	1				8	7						1				
13	1	1				14	6										
13	2	1				70	1								1		
13	3	1				73	18										

Fence	Treat	Year	Bri.med	Cam.sch	Car.def	Car.atr	Car.cap	Car.car	Car.fla	Car.orn	Car.sem	Car.aca	Caru.ca	Cer.arv	Cer.fon	Chr.alt	Cir.aca
1	1	1	24	1				2				1					3
1	2	1	51					3				4			1		12
1	3	1	87	5				5				1					11
1	4	1	95	1				5							1		5
1	5	1	62	1				3									47
2	1	1	23								129	10					5
2	2	1	3	1				3			76	10					16
2	3	1	3								103	3					7
2	4	1	3	1				8			72	4					
2	5	1	11	3							159						15
3	1	1	60	4				37		4	2						27
3	2	1	51	4				30			1				1		
3	3	1	45	1				13		2		2			2		28
3	4	1	17	1				13		4							35
3	5	1	138	4				37			14	10					1
4	1	1						2			41	1					
4	2	1	7	1				4			71						4
4	3	1									83						2
4	4	1	1	1						1	96						2
4	5	1									88	3					5
5	1	1	5					8			3		6				
5	2	1	84	2				19			62	1	13				15
5	3	1	49	2			1				1		4				4
5	4	1	32	3							1		1				25
5	5	1	9										9				54
6	1	1	6	2		17		4		7	192	1					
6	2	1	5	2				2			53	11					21
6	3	1	2	2				3			2	2					2
6	4	1	12			1		20			9	8					
6	5	1	1	1		7		34			7	1					10
7	1	1						1				3					
7	2	1	3	2				36				10					
7	3	1	37	3				11				1					3
7	4	1						1				2					
7	5	1	2	1				1									
8	1	1	43					4			26				1		
8	2	1	76	3							2						11
8	3	1	37	2				2		3	7						1
8	4	1	16					1							1		
8	5	1		1				7			48			1			3
9	1	1	8	2				85				1					3
9	2	1	13	9				61			8	1	1				
9	3	1	10	1				64									1
9	4	1	10	2				93									
9	5	1	9					65						1			9
10	1	1	11								126	6			1		
10	2	1	5	2				1			133	3			3		5
10	3	1	9	1							191						
10	4	1	8	1							142	1					3
10	5	1	4	1							157	1					
11	1	1	25					16									
11	2	1	20	4				71									
11	3	1	33	1				55							1		
11	4	1	39					33									
11	5	1	29	4				30									
12	1	1	34	5				7						1			
12	2	1	56	4				14			7			1			
12	3	1	38	5				9			57			1			4
12	4	1	51	11				22			21			3			
12	5	1	25	6				17			36						1
13	1	1	44	5				14						3			
13	2	1	16	8				25						2			
13	3	1	29	3				31					10				2

Fence	Treat	Year	Cre.alp	Cre.aur	Cus.	Dap.str	Des.cae	Dry.oct	Ely.myo	Eri.car	Eri.uni	Eri.alp	Eup.min	Eup.mon	Fes.ovi	Fes.rub	Gal.pum
1	1	1	1													36	4
1	2	1		4												26	6
1	3	1		2					1							15	6
1	4	1		9												32	3
1	5	1		1												43	23
2	1	1														2	9
2	2	1										1			65	26	18
2	3	1														4	6
2	4	1													2		18
2	5	1														42	9
3	1	1										2	2			17	16
3	2	1										2			17	13	17
3	3	1														31	16
3	4	1				5										18	14
3	5	1										1				50	30
4	1	1		4												8	4
4	2	1		3					6							12	1
4	3	1		2												12	15
4	4	1		3												5	9
4	5	1														7	7
5	1	1		10												31	5
5	2	1		10												165	7
5	3	1		1								1				73	2
5	4	1		1												47	7
5	5	1		4											2	114	20
6	1	1				2										6	7
6	2	1														31	5
6	3	1														37	4
6	4	1															1
6	5	1		1												3	2
7	1	1				4			2	7					4	49	1
7	2	1				4			2			5			2	103	4
7	3	1				9										23	6
7	4	1				6									44		
7	5	1													4	219	11
8	1	1		2					16							27	1
8	2	1		3												148	12
8	3	1		3												108	7
8	4	1		8												142	9
8	5	1		2					28							33	6
9	1	1		1		1										21	3
9	2	1		8												30	12
9	3	1		4												4	2
9	4	1		4												4	5
9	5	1														33	8
10	1	1	2			1										7	6
10	2	1	6													8	2
10	3	1														2	5
10	4	1														5	4
10	5	1				3								1		3	
11	1	1		1											55	1	11
11	2	1													32	8	3
11	3	1													58	14	19
11	4	1							3						16		5
11	5	1		2											82	24	14
12	1	1													8	4	8
12	2	1		2					9						38	17	12
12	3	1							4						31	39	7
12	4	1													20	53	6
12	5	1		5					8						33	23	16
13	1	1		6												40	11
13	2	1		2												189	7
13	3	1	1	1												130	32

Fence	Treat	Year	Gal.ver	Gen.cam	Gen.cil	Gen.niv	Gen.ver	Ger.sil	Geu.mon	Hel.alp	Hel.num	Hel.pub	Hie.bif	Hie.lac	Hie.pil	Hip.com	Hom.alp
1	1	1															
1	2	1															
1	3	1										3					
1	4	1					1										
1	5	1															
2	1	1								9						10	
2	2	1								1						2	
2	3	1								1	33						
2	4	1								26				4			
2	5	1								3		2					
3	1	1									4				2		
3	2	1									3				8		
3	3	1					2					25					
3	4	1									5	2			22		
3	5	1									4				1		
4	1	1									13					7	
4	2	1									5					5	
4	3	1									12						
4	4	1									7						
4	5	1									5					1	
5	1	1															
5	2	1															
5	3	1															
5	4	1					1										
5	5	1								2							
6	1	1								7							
6	2	1									22	2					
6	3	1								3	17					9	
6	4	1									87					19	
6	5	1									27				1		
7	1	1									28				2		13
7	2	1									20						13
7	3	1									17						7
7	4	1									33					3	4
7	5	1							1		15	3					21
8	1	1															
8	2	1															
8	3	1					1										
8	4	1															
8	5	1									9						
9	1	1					1										
9	2	1															
9	3	1															
9	4	1					3							2			
9	5	1														22	
10	1	1															
10	2	1								23							
10	3	1								3							
10	4	1								1							
10	5	1								1	19					1	
11	1	1													15		
11	2	1									3	3		4		2	
11	3	1										6			18		
11	4	1										11		1	2	10	
11	5	1									1				3		
12	1	1												1	1	1	
12	2	1													13		
12	3	1													4	9	
12	4	1													5		
12	5	1					1								19		
13	1	1					1										
13	2	1			1		1										
13	3	1															

Fence	Treat	Year	Koe.pyr	Leo.his	Leu.vul	Lot.cor	Luz.mul	Med.lup	Mel.pra	Min.ver	Myo.alp	Nar.str	Par.pal	Phl.alp	Phy.orb	Pla.alp	Pla.atr
1	1	1															
1	2	1				3											6
1	3	1				5									2		1
1	4	1															6
1	5	1				3											
2	1	1			3	2									2		5
2	2	1				4									2	4	31
2	3	1													2		3
2	4	1				1											22
2	5	1			3										4		4
3	1	1	18	5			2										5
3	2	1		1		11											11
3	3	1	2	8		10							1				11
3	4	1				4											17
3	5	1		7		5	1									22	31
4	1	1													2		1
4	2	1		1	1										9		7
4	3	1															1
4	4	1			4	1									1		3
4	5	1					2										3
5	1	1		9		1											3
5	2	1		1		3									1		9
5	3	1		6		2									2		1
5	4	1		13		10											
5	5	1		8		4									1		3
6	1	1		6		2									7		12
6	2	1		19		5	1						1		1		7
6	3	1		7		21									1		
6	4	1		13		8				1					1		15
6	5	1		25		14	1								2		12
7	1	1		6													
7	2	1													9		
7	3	1			2	11						131					8
7	4	1		2	5							15			4		
7	5	1		2		2						71			2		3
8	1	1				6	1				1	41					4
8	2	1		4		5						2					10
8	3	1		3		5	2					75					7
8	4	1		6			3					89			2		6
8	5	1					2								1		25
9	1	1		4		1				1							5
9	2	1		5		13					1						9
9	3	1		12		7				4	1						
9	4	1		4		2											1
9	5	1		1		10				2							4
10	1	1												3			1
10	2	1				7										1	3
10	3	1		3		8								1			2
10	4	1				1	2							1		1	9
10	5	1				8									1		1
11	1	1		4		4					4						
11	2	1														5	
11	3	1	2	7		5											1
11	4	1	7	4		5					2				2	9	
11	5	1	40			15		3									
12	1	1				6						197			1		
12	2	1		6		1										8	2
12	3	1		1		4						95				10	4
12	4	1	16	5		8						48				6	2
12	5	1	34	2		1					1						1
13	1	1				2											6
13	2	1															
13	3	1															3

Fence	Treat	Year	Pla.med	Poa.alp	Poa.ann	Pol.alp	Pol.cha	Pol.viv	Pot.aur	Pot.cra	Pot.ere	Pri.far	Pru.vul	Pul.ver	Ran.acr	Ran.alp	Ran.mon
1	1	1								4							14
1	2	1								4							11
1	3	1											2				7
1	4	1		4						1							5
1	5	1															5
2	1	1							1	7							
2	2	1							4	3							
2	3	1		1				1		5							
2	4	1								3							3
2	5	1								7							5
3	1	1		12					2	4							2
3	2	1		15					1	5							
3	3	1		51		1				2					1		8
3	4	1		6						7							4
3	5	1						1		7							1
4	1	1	1	7				3		1							
4	2	1								1							1
4	3	1		1				1		14							
4	4	1								2		1					1
4	5	1		19				2		21							
5	1	1											2				4
5	2	1											3				6
5	3	1				1											8
5	4	1											3				6
5	5	1				1		1		1			2				2
6	1	1		1				1		5							
6	2	1				2		3		1							7
6	3	1				3		2		3							
6	4	1								4							2
6	5	1								2							5
7	1	1						1	2								
7	2	1						1				5					
7	3	1										1					1
7	4	1						1				10					
7	5	1						6	3								
8	1	1		1				2	1	5						1	
8	2	1		2		2				1							2
8	3	1	1						5	3							
8	4	1						4	8								
8	5	1						2	2	1							
9	1	1								3							
9	2	1								1			1				1
9	3	1		1						1							
9	4	1															
9	5	1		2													
10	1	1								2							3
10	2	1											2				1
10	3	1															1
10	4	1															3
10	5	1		1		1											1
11	1	1		1						3							
11	2	1		3						2							
11	3	1		12						14							
11	4	1		2						7							
11	5	1	1	45						11		5					
12	1	1								1							1
12	2	1	1				1			3							
12	3	1				1	1			7							
12	4	1	3			4				7							
12	5	1					3			5			1				
13	1	1															
13	2	1											4				2
13	3	1															1

Fence	Treat	Year	Sal.her	Sal.ser	San.min	Sca.luc	Sel.sel	Sem.tec	Sen.abr	Ses.cae	Sib.pro	Sil.aca	Sil.nut	Sol.alp	Tar.off	Tha.alp	The.alp	Thy.ser
1	1	1																
1	2	1																
1	3	1															1	
1	4	1											1					
1	5	1																
2	1	1							1	45						2		
2	2	1							5									16
2	3	1								91						3		3
2	4	1							10	8								36
2	5	1								5								
3	1	1							15	2								33
3	2	1											8					48
3	3	1								9								
3	4	1							8	3			6					2
3	5	1																34
4	1	1								108								2
4	2	1								113						1		
4	3	1								140						14		
4	4	1								87								
4	5	1								106					1			
5	1	1								1								
5	2	1												2	5			
5	3	1																
5	4	1																
5	5	1																
6	1	1								49			1					3
6	2	1								73				3	2	4		
6	3	1								144				1				1
6	4	1								64		3				20		27
6	5	1								41						17		40
7	1	1					4			24				1		1		1
7	2	1					4			79				6		2		
7	3	1							6	46					11			
7	4	1					4		2	57				1		4		
7	5	1					3		33	71				7		4		3
8	1	1												7		4		
8	2	1								13				3		4		
8	3	1								1	1			1		3		
8	4	1														1		
8	5	1				5	1			1		9				7		1
9	1	1							3									26
9	2	1							7									19
9	3	1						4		1								20
9	4	1							6	4								11
9	5	1							1	6								27
10	1	1							6	9						4		4
10	2	1							13	3			6					8
10	3	1							1	10								
10	4	1							6	1			1					8
10	5	1							4	4			1					4
11	1	1																6
11	2	1																3
11	3	1																10
11	4	1																1
11	5	1											2					19
12	1	1																5
12	2	1								3								10
12	3	1																6
12	4	1																23
12	5	1																9
13	1	1																
13	2	1													1			
13	3	1																

Fence	Treat	Year	Tri.pum	Tri.bad	Tri.pra	Tri.rep	Tri.fla	Ver.aph	Ver.cha	Ver.off	Ver.ser	Ver.aph	Vio.bif	Vio.cal	Vio.rup
1	1	1				5	1								
1	2	1				5									
1	3	1				5	2								
1	4	1				9	8								
1	5	1				16	11								
2	1	1				1									
2	2	1			8	2									
2	3	1				3									
2	4	1				3									
2	5	1				2									
3	1	1				4									
3	2	1				3	3								
3	3	1				15	2								
3	4	1				4	3								
3	5	1				3									
4	1	1			6										
4	2	1			1										
4	3	1													
4	4	1													
4	5	1													
5	1	1				23									
5	2	1			3	11	3							1	
5	3	1				22	25								1
5	4	1				28	10								
5	5	1			9	9	29								
6	1	1			16	3									
6	2	1			8	1									
6	3	1			13	4									
6	4	1			12										
6	5	1													
7	1	1			1										
7	2	1													
7	3	1													
7	4	1													
7	5	1			2	6									
8	1	1		2		5								1	
8	2	1		20											1
8	3	1		7	1	2	1				1			1	
8	4	1		20											
8	5	1			16	1					1				
9	1	1													
9	2	1				2					1				
9	3	1									7				
9	4	1													
9	5	1			1	1									
10	1	1			1										
10	2	1													
10	3	1				2									
10	4	1			2										
10	5	1				2									
11	1	1				3									
11	2	1													
11	3	1				1									
11	4	1			2										
11	5	1				34	11								
12	1	1													
12	2	1				2									
12	3	1													1
12	4	1			4	6									
12	5	1				2									
13	1	1				3									
13	2	1				29	2								5
13	3	1				24	2			13					1

Fence	Treat	Year	Ach.mil	Aci.alp	Aco.nap	Agr.cap	Alc.xan	And.cha	Ant.dio	Ant.vul	Ant.odo	Ara.alp	Ara.cil	Ast.bel	Bar.alp	Bis.lae	Bot.lun
13	4	1	7			63	12										
13	5	1	1			43	11										
14	1	1				4				1							
14	2	1	3			4											
14	3	1	13			12											
14	4	1	44														
14	5	1					1										
15	1	1				2	1										
15	2	1	1			50											
15	3	1				36	5										
15	4	1				31	1										
15	5	1				38											
16	1	1															
16	2	1												8			
16	3	1				3											
16	4	1															
16	5	1				6				1				1			
17	1	1											1				
17	2	1											1				1
17	3	1															
17	4	1					3										
17	5	1											1				
18	1	1				1											
18	2	1	3											1			
18	3	1	5							1							
18	4	1	3														
18	5	1	3				2										
1	1	2	3				9						1				
1	2	2					2						1				
1	3	2					11										
1	4	2					4										
1	5	2	4				22										
2	1	2	2														
2	2	2	2				2										
2	3	2															
2	4	2	3														
2	5	2	13														
3	1	2	1														
3	2	2	3														
3	3	2	1				5										
3	4	2	10														
3	5	2					1										
4	1	2	1					5									
4	2	2															
4	3	2	14														
4	4	2	3														
4	5	2	4														1
5	1	2															
5	2	2					4										
5	3	2					5										
5	4	2	10			1	1										
5	5	2	5				4						1				
6	1	2					1										
6	2	2															
6	3	2					3										
6	4	2								1							
6	5	2								2							
7	1	2								4				3			
7	2	2								5				3			
7	3	2								10				8			
7	4	2								3				6			
7	5	2				1				1				1			
8	1	2	7														1

Fence	Treat	Year	Bri.med	Cam.sch	Car.def	Car.atr	Car.cap	Car.car	Car.fla	Car.orn	Car.sem	Car.aca	Caru.ca	Cer.arv	Cer.fon	Chr.alt	Cir.aca
13	4	1	50	3				8						2			9
13	5	1	23	1													
14	1	1	11	1				22			138	2					
14	2	1	71	2							178	1		16			2
14	3	1	53	6							133			14			
14	4	1	105	3				40			12	1					
14	5	1	136	2							210						3
15	1	1		1		19		2									
15	2	1		1													
15	3	1															
15	4	1		1													
15	5	1		2				1									
16	1	1				6		6			23		1				
16	2	1				4		1			56						
16	3	1		2		2	4	2					3				
16	4	1		2		4		5									
16	5	1	1					6					2				
17	1	1	14				26										
17	2	1	5					1									
17	3	1	1			5	14	16									
17	4	1		1													
17	5	1	11	2		5	3	10			15						
18	1	1	2					27			3						1
18	2	1	14				15	32			16						
18	3	1	3	1			24	16			10		2				
18	4	1	4	1			2	3									
18	5	1	10	1				19									
1	1	2	29	5				26				3					1
1	2	2	90	7				5				6			4		18
1	3	2	93	10				28				9					21
1	4	2	145	10				10				10			1		6
1	5	2	82	6				7				9	1				54
2	1	2	3	1							78	5			1		4
2	2	2	8					3			73	2					18
2	3	2	2	1				1			53	5			1		3
2	4	2	3	2				10		1	43						
2	5	2	8	2							150						20
3	1	2	41	1				16		10	12	2					21
3	2	2	18	1				21				2					2
3	3	2	112	3				10				4					12
3	4	2	23	5				7		2		5					20
3	5	2	153	12				22		9	38	3					4
4	1	2	7								27	3					
4	2	2	8							16	37	5					1
4	3	2	1							10	60	2					5
4	4	2	2							19	67	1					1
4	5	2	3	1						10	74	2			1		9
5	1	2	35					10			3		9				
5	2	2	78	2							99		15				14
5	3	2	132					29					2				5
5	4	2	123	1						3	2	1	6				51
5	5	2	101										5				54
6	1	2	15	1				33	6	14	183	1					
6	2	2	9					6		1	60	18					21
6	3	2	14		1			13		1	22						2
6	4	2	6	1				9		1	5	3					1
6	5	2	2	1				20	4	4	31	1					3
7	1	2		1								2					1
7	2	2						18		2							
7	3	2	50	1						5							
7	4	2								3	1	2					
7	5	2		1				2		2							1
8	1	2	47	6						5	41	3					3

Fence	Treat	Year	Cre.alp	Cre.aur	Cus.	Dap.str	Des.cae	Dry.oct	Ely.myo	Eri.car	Eri.uni	Eri.alp	Eup.min	Eup.mon	Fes.ovi	Fes.rub	Gal.pum
13	4	1		1												137	22
13	5	1		3												187	46
14	1	1		1												17	7
14	2	1											2			71	7
14	3	1							11							30	
14	4	1														91	20
14	5	1		1									4	1		89	7
15	1	1		6			47									41	
15	2	1														235	1
15	3	1					47		3							189	10
15	4	1		1			52		13							94	
15	5	1					41									125	
16	1	1		5			6		41						2	15	
16	2	1		1					48						26	9	
16	3	1		1			13		69					1	20	37	
16	4	1		13			4		75							36	
16	5	1		4					70			1			15	39	
17	1	1					40		4							27	2
17	2	1					25		18							82	8
17	3	1		1			72		76							51	
17	4	1					146									123	
17	5	1					87		24							133	
18	1	1					7		6							3	13
18	2	1		8			41		21							14	
18	3	1		14			27		16						5	21	
18	4	1		2			35		29				2			37	
18	5	1		22			34		17							44	
1	1	2														17	2
1	2	2		1										6		13	8
1	3	2														9	14
1	4	2		7												10	3
1	5	2												21		47	26
2	1	2														3	3
2	2	2													75	33	9
2	3	2														4	4
2	4	2													1	4	11
2	5	2														48	12
3	1	2		6										1	2	17	17
3	2	2													12	15	1
3	3	2		11												22	4
3	4	2				2										18	7
3	5	2													2	69	19
4	1	2		1												6	
4	2	2		4					1							3	7
4	3	2		2												28	
4	4	2		13												3	3
4	5	2		7												12	6
5	1	2	6	3							1					34	8
5	2	2	2	2												101	12
5	3	2	8	15												33	6
5	4	2		11									1		1	45	18
5	5	2	11													92	15
6	1	2		3									2			12	3
6	2	2		13	13									1		23	3
6	3	2	2	1												28	2
6	4	2		5	1									3		2	1
6	5	2		13												2	5
7	1	2	1	1		3				14	1				7	61	2
7	2	2				7					1				42	1	1
7	3	2				12							1		7	160	5
7	4	2				3					1				6	29	
7	5	2		1											12	311	4
8	1	2		6					31							18	3

Fence	Treat	Year	Gal.ver	Gen.cam	Gen.cil	Gen.niv	Gen.ver	Ger.sil	Geu.mon	Hel.alp	Hel.num	Hel.pub	Hie.bif	Hie.lac	Hie.pil	Hip.com	Hom.alp
13	4	1															
13	5	1															
14	1	1							1		24			2		1	
14	2	1												2			
14	3	1												12	28		
14	4	1												1			
14	5	1												1			
15	1	1					1										
15	2	1															
15	3	1															
15	4	1															
15	5	1															
16	1	1	1														
16	2	1					1										
16	3	1															
16	4	1					1										
16	5	1															
17	1	1					4										
17	2	1					4			6							
17	3	1															
17	4	1															
17	5	1															
18	1	1					1										
18	2	1					1										
18	3	1															
18	4	1															
18	5	1															
1	1	2													3		
1	2	2										1					
1	3	2															
1	4	2										1			1		
1	5	2														4	
2	1	2									4					4	
2	2	2															
2	3	2									43						
2	4	2									36			1			
2	5	2															
3	1	2					1								3		
3	2	2													1		
3	3	2					1										
3	4	2													12		
3	5	2									3				2		
4	1	2									13					2	
4	2	2								5						5	
4	3	2	9								4						
4	4	2									9						
4	5	2									6			3		6	
5	1	2									3						
5	2	2															
5	3	2															
5	4	2															
5	5	2															
6	1	2								5	3						
6	2	2								7	3						
6	3	2								26						6	
6	4	2									43					22	
6	5	2								22							
7	1	2								18							3
7	2	2								23						1	5
7	3	2						1		9							6
7	4	2								27							2
7	5	2						9	2	8		1					8
8	1	2									2						

Fence	Treat	Year	Koe.pyr	Leo.his	Leu.vul	Lot.cor	Luz.mul	Med.lup	Mel.pra	Min.ver	Myo.alp	Nar.str	Par.pal	Phl.alp	Phy.orb	Pla.alp	Pla.atr
13	4	1				3											
13	5	1				5											
14	1	1		11		7			1		1				9		4
14	2	1				2									1		3
14	3	1				11	2					45			2		8
14	4	1		1		12	1					184		19	7		1
14	5	1		3		1	1					7			4		6
15	1	1		2													
15	2	1															
15	3	1															
15	4	1															
15	5	1									1						
16	1	1		18			1						1				
16	2	1		9													
16	3	1		18										3			
16	4	1		20		3						19					
16	5	1		7													
17	1	1		4			1										
17	2	1		3													
17	3	1									2						
17	4	1															
17	5	1		9							1						
18	1	1		12								16					
18	2	1		15		2									4		
18	3	1		22													
18	4	1		23													
18	5	1		26			3					7			2		
1	1	2				1											1
1	2	2				10								13			10
1	3	2				13									3		7
1	4	2				1									3		10
1	5	2				1											
2	1	2			1										1		4
2	2	2		2		4										6	22
2	3	2				4									4		4
2	4	2				1									2		15
2	5	2													3		5
3	1	2		2		10											7
3	2	2				3										4	2
3	3	2	4			6									5		
3	4	2		2		6											5
3	5	2		5		9										7	19
4	1	2			1	3									2		2
4	2	2		1											11		10
4	3	2															2
4	4	2	1	2	3										2		8
4	5	2													6	2	6
5	1	2		1													2
5	2	2		2		2								1	1		6
5	3	2		10		1								5	1		
5	4	2		8		15								3	4		7
5	5	2		3										1	1		3
6	1	2		2										2	5		7
6	2	2		3		10											6
6	3	2		1		21									1		
6	4	2		3		2	1				1				1		7
6	5	2		3		14									2		10
7	1	2		1											2		
7	2	2			2							27			7		
7	3	2			1	5						1			1		4
7	4	2			5	4						3			1		2
7	5	2	1			5	2					55			5		7
8	1	2				10						55		6			6

Fence	Treat	Year	Pla.med	Poa.alp	Poa.ann	Pol.alp	Pol.cha	Pol.viv	Pot.aur	Pot.cra	Pot.ere	Pri.far	Pru.vul	Pul.ver	Ran.acr	Ran.alp	Ran.mon
13	4	1															2
13	5	1		1									15				
14	1	1								4			2				2
14	2	1						4		2							6
14	3	1		9					1	2							4
14	4	1		47						4							9
14	5	1		9				1	1	7							2
15	1	1		1				2									9
15	2	1		4													10
15	3	1				1											25
15	4	1						2									45
15	5	1		47													44
16	1	1						2		2						1	
16	2	1														7	2
16	3	1							1							1	2
16	4	1							1								
16	5	1														11	
17	1	1		3												2	9
17	2	1		12						3						2	8
17	3	1		18												1	11
17	4	1		55													3
17	5	1		26					1							2	8
18	1	1							21							3	1
18	2	1						1									6
18	3	1						2	1							1	4
18	4	1						3	10	1						2	4
18	5	1		5					1							3	5
1	1	2								4							14
1	2	2								3					4		12
1	3	2				1				3					1		8
1	4	2															6
1	5	2		1					1	1					5		2
2	1	2							1	2							
2	2	2															
2	3	2						2									2
2	4	2								5							
2	5	2		5					3	11					6		1
3	1	2				2				2							
3	2	2								2							
3	3	2													4		1
3	4	2								2							
3	5	2				3				2					1		3
4	1	2	1														1
4	2	2						2									
4	3	2							2	5					1		2
4	4	2				2											
4	5	2	1					1		7	3						1
5	1	2		1													3
5	2	2													4		3
5	3	2															2
5	4	2				2									1		3
5	5	2								1					3		2
6	1	2				1		1		5		1					1
6	2	2						1		1					1		
6	3	2				1		5							1		1
6	4	2								5							
6	5	2								5							1
7	1	2					4	1									
7	2	2					6	1				9					
7	3	2				1		1				1					1
7	4	2					8										
7	5	2		1			1	7		8				1			
8	1	2		6		2		5	6								

Fence	Treat	Year	Sal.her	Sal.ser	San.min	Sca.luc	Sel.sel	Sem.tec	Sen.abr	Ses.cae	Sib.pro	Sil.aca	Sil.nut	Sol.alp	Tar.off	Tha.alp	The.alp	Thy.ser
13	4	1																
13	5	1																
14	1	1								14				2				5
14	2	1								1			5					
14	3	1							1									
14	4	1								1								
14	5	1												2				
15	1	1								34								
15	2	1								35								
15	3	1								33								
15	4	1								21								
15	5	1					2			29								
16	1	1					1			25				6				
16	2	1								26				2				
16	3	1								22				9				
16	4	1					1			19				9				
16	5	1					1			20				2		2		
17	1	1								2								
17	2	1								7								
17	3	1					2				2							
17	4	1								4								
17	5	1								7								
18	1	1	2									20						
18	2	1					1			58		1		4				
18	3	1								2								
18	4	1					3				4							
18	5	1	5				6							2				
1	1	2											1					
1	2	2											4					
1	3	2																
1	4	2											7					
1	5	2																
2	1	2								66						4		
2	2	2							7	2								18
2	3	2							1	83								
2	4	2								10			1				1	
2	5	2							2	7								
3	1	2							5	2								16
3	2	2											7				1	7
3	3	2																
3	4	2								2			3					
3	5	2											2					2
4	1	2								122								
4	2	2								109						5		
4	3	2								197						14		
4	4	2								96								
4	5	2								188						1		
5	1	2																
5	2	2												1				
5	3	2																
5	4	2								2								
5	5	2								3								
6	1	2								29						1		5
6	2	2								43				2		1		
6	3	2								138					1			4
6	4	2								20		2				5		6
6	5	2								41						14		5
7	1	2					3			26				1		5		
7	2	2					2			86								
7	3	2							9	37						2		1
7	4	2							9	49						1		1
7	5	2							8	74				3		2	1	
8	1	2									1					4	4	

Fence	Treat	Year	Tri.pum	Tri.bad	Tri.pra	Tri.rep	Tri.fla	Ver.aph	Ver.cha	Ver.off	Ver.ser	Ver.aph	Vio.bif	Vio.cal	Vio.rup
13	4	1				18				32					
13	5	1				14	1								
14	1	1										3			
14	2	1			3	3									
14	3	1				2									
14	4	1			12	5									
14	5	1			11	1									
15	1	1												1	
15	2	1				6							6		
15	3	1				11									
15	4	1				4							1		
15	5	1				2									
16	1	1												2	
16	2	1													
16	3	1											4	3	
16	4	1													
16	5	1												1	
17	1	1				7									
17	2	1				6						2			
17	3	1			1	9						1	2		
17	4	1				5									
17	5	1				14							1		
18	1	1				1						2			
18	2	1			1	2									
18	3	1			1	1									
18	4	1			1							1			
18	5	1				1						4			
1	1	2				2									
1	2	2				4	2								
1	3	2				4	5								
1	4	2				4	2								
1	5	2				7	26								
2	1	2				2									
2	2	2			1	2									
2	3	2													
2	4	2													
2	5	2			2	8									
3	1	2	1			5	3								
3	2	2			6										
3	3	2				3									
3	4	2			1	5									
3	5	2	1			4	3								
4	1	2	1												
4	2	2	2		2										
4	3	2			1	3									
4	4	2													
4	5	2													
5	1	2	4			18	5	5							
5	2	2			7	4	18	2							
5	3	2				11	64	1							
5	4	2	3			17	36								
5	5	2			6	5	67								
6	1	2			8	2		2							
6	2	2			7										
6	3	2			2										
6	4	2			5										
6	5	2	1		4			1							
7	1	2													
7	2	2													
7	3	2				6			1						
7	4	2							1						
7	5	2			6										
8	1	2				1									

Fence	Treat	Year	Ach.mil	Aci.alp	Aco.nap	Agr.cap	Alc.xan	And.cha	Ant.dio	Ant.vul	Ant.odo	Ara.alp	Ara.cil	Ast.bel	Bar.alp	Bis.lae	Bot.lun
8	2	2	30										1	1			
8	3	2	12				12							4			
8	4	2	9				1				1	1		1			
8	5	2	11							14				4			
9	1	2	2														
9	2	2	1				2										
9	3	2															
9	4	2															
9	5	2				1				2					1		
10	1	2	2														
10	2	2	3														
10	3	2	2				7										
10	4	2	4				5										
10	5	2	4							4							
11	1	2	3														
11	2	2	9										1				
11	3	2	6			1	2										
11	4	2	2														
11	5	2	20			2											
12	1	2	5				2										
12	2	2	1				1										
12	3	2					4		2								
12	4	2	5				1										
12	5	2					4										
13	1	2															
13	2	2	6			1											
13	3	2	5				6										
13	4	2	7				18										
13	5	2	1			8	11										
14	1	2						2									
14	2	2	5														
14	3	2	7			9											
14	4	2	34				2										
14	5	2				19	3										
15	1	2															
15	2	2			2	1	1										
15	3	2				2	2										
15	4	2															
15	5	2					1										
16	1	2				1					6						
16	2	2												2			
16	3	2															
16	4	2				5					2						
16	5	2								5	21			1			
17	1	2															
17	2	2				12											
17	3	2												1			
17	4	2			2												
17	5	2				1	2			2							
18	1	2				1											
18	2	2	4											2			
18	3	2	6								1			1			
s	4	2	9											1			
18	5	2	8				2										

Fence	Treat	Year	Bri.med	Cam.sch	Car.def	Car.atr	Car.cap	Car.car	Car.fla	Car.orn	Car.sem	Car.aca	Caru.ca	Cer.arv	Cer.fon	Chr.alt	Cir.aca
8	2	2	89	14						4	49	1			1		21
8	3	2		8						1	11	2					1
8	4	2	82	5							1						
8	5	2						6			25	3			2		
9	1	2	3					61				8					
9	2	2	10	2				60		2		3			1		6
9	3	2						55				4					
9	4	2	4					50		6		2					
9	5	2	10	3				76		9		1			1		7
10	1	2	24					2			219	2					
10	2	2	10					22		2	165	5					4
10	3	2	27	2							246	1					
10	4	2	18								233	1					12
10	5	2	8	1						1	190				1		
11	1	2	36	1				21									
11	2	2	44	7				78									
11	3	2	43	3				33							1		
11	4	2	32	1				34				2					
11	5	2	70	5				33							13		
12	1	2	63	1				4									
12	2	2	51	4				10			3	3			3		
12	3	2	61	6				4			35	4			2		
12	4	2	94	10				13			25	1			4		
12	5	2	18	7							78				1		
13	1	2	46	2				15									
13	2	2	76	5				20							1		
13	3	2	120	9				22					3		3		9
13	4	2	97	4				10					1		4		10
13	5	2	144	9				16									
14	1	2	15	2	1					8	120						
14	2	2	69								131				2		4
14	3	2	54	9						1	95				7		
14	4	2	66	3							29				6		
14	5	2	171	1				5			141	3			3		4
15	1	2					3				2						
15	2	2														5	
15	3	2		3												1	
15	4	2	3	4												1	
15	5	2		4													
16	1	2		5			15			1	24						
16	2	2		3			3				70						
16	3	2		1			7		3				11				
16	4	2		3		8	3			4							
16	5	2		1			10						4				
17	1	2	26	2		20	18						1				
17	2	2				5											
17	3	2		2		4	12										
17	4	2															
17	5	2	20			27					2						
18	1	2		1				11	1		5						
18	2	2		8				24			34		1		1		
18	3	2		2			11				17		5				
s	4	2		4		11	3										
18	5	2	15	5		12					3						

Fence	Treat	Year	Cre.alp	Cre.aur	Cus.	Dap.str	Des.cae	Dry.oct	Ely.myo	Eri.car	Eri.uni	Eri.alp	Eup.min	Eup.mon	Fes.ovi	Fes.rub	Gal.pum
8	2	2		3											17	95	5
8	3	2		1			10									11	24
8	4	2	11	5			13									37	6
8	5	2	1	6				4	57		1				4	33	7
9	1	2	1													12	2
9	2	2												1		18	5
9	3	2	1				3						1			1	
9	4	2	5			9					1					6	2
9	5	2														27	2
10	1	2				5										8	1
10	2	2							1								2
10	3	2															4
10	4	2		2												3	11
10	5	2				4								1			2
11	1	2		4											24	13	9
11	2	2		1											26		
11	3	2		5											30	21	8
11	4	2							9						17	13	2
11	5	2		1											38	20	10
12	1	2													3		12
12	2	2	4						8						3		11
12	3	2													6		10
12	4	2	4	3											9	4	9
12	5	2		7			70		5						55	30	11
13	1	2		3											1	11	8
13	2	2		2												24	16
13	3	2	2										1			62	23
13	4	2	1	2												90	27
13	5	2		9												94	26
14	1	2		1											1	4	5
14	2	2															11
14	3	2												1		22	7
14	4	2														18	23
14	5	2		4										3		19	6
15	1	2	16	3			60						1			28	
15	2	2					82									149	17
15	3	2					112									154	16
15	4	2					135		7							64	
15	5	2					199									146	
16	1	2		9			6		39							6	1
16	2	2	8	5			1		63						16	26	
16	3	2	5	6			24		64						32	30	
16	4	2	8	9			13		109				1	5	13	49	
16	5	2	11	9					57					1	6	49	
17	1	2														36	
17	2	2	1				5									52	1
17	3	2					43		58				1				
17	4	2					163									57	
17	5	2	1				48		8							101	
18	1	2	3													14	6
18	2	2	5	2					2							20	
18	3	2	13	8			14		5						6	29	
s	4	2	9	4			36		69				1	2			
18	5	2	2	5			16							5		34	

Fence	Treat	Year	Gal.ver	Gen.cam	Gen.cil	Gen.niv	Gen.ver	Ger.sil	Geu.mon	Hel.alp	Hel.num	Hel.pub	Hie.bif	Hie.lac	Hie.pil	Hip.com	Hom.alp
8	2	2					1	1									
8	3	2															1
8	4	2															
8	5	2							2	12							2
9	1	2															
9	2	2															
9	3	2					1										
9	4	2															
9	5	2														8	
10	1	2					1										
10	2	2					4			5	14						
10	3	2															
10	4	2															
10	5	2									26					1	
11	1	2													9		
11	2	2	5												8		
11	3	2													15		
11	4	2									2				3	6	
11	5	2									4		4				
12	1	2													1	1	
12	2	2												2	6		
12	3	2													2	7	
12	4	2												1	7		
12	5	2													10		
13	1	2					2										
13	2	2					1										
13	3	2															
13	4	2															
13	5	2												1			
14	1	2								17							
14	2	2									1						
14	3	2												1	17		
14	4	2															
14	5	2		1													
15	1	2				3											
15	2	2															
15	3	2															
15	4	2															
15	5	2															
16	1	2															
16	2	2															
16	3	2					3										
16	4	2															
16	5	2															
17	1	2					4			6							
17	2	2															
17	3	2				1											
17	4	2															
17	5	2		4													
18	1	2															
18	2	2															
18	3	2															
s	4	2					1										
18	5	2		1													

Fence	Treat	Year	Koe.pyr	Leo.his	Leu.vul	Lot.cor	Luz.mul	Med.lup	Mel.pra	Min.ver	Myo.alp	Nar.str	Par.pal	Phl.alp	Phy.orb	Pla.alp	Pla.atr
8	2	2				6											9
8	3	2		1		2						140		98	1		7
8	4	2		1								113			3		8
8	5	2				22									5		10
9	1	2		1													3
9	2	2		3		16											9
9	3	2		2		8											
9	4	2				3				3							1
9	5	2		3		5				6							2
10	1	2	1	1		2											5
10	2	2		3		16											8
10	3	2				6								3	1		2
10	4	2															19
10	5	2	1			12	1								5	14	7
11	1	2	1	1		6											3
11	2	2	14			1										1	
11	3	2	10			13											
11	4	2	7			3									1	1	2
11	5	2	10			5											1
12	1	2				20						264			1	20	
12	2	2		1		4						44				18	
12	3	2	2			14						165				12	6
12	4	2	9			12						100				7	6
12	5	2	17	3		4									2		1
13	1	2				7						17			1		6
13	2	2				2						197					
13	3	2		1								7					1
13	4	2				2											
13	5	2				1											
14	1	2		1		6						4			4		5
14	2	2				5						69			6		4
14	3	2				5						33			3		10
14	4	2				2						118		39	4		3
14	5	2	1			1						42					1
15	1	2															
15	2	2															
15	3	2															
15	4	2															
15	5	2															
16	1	2		3													
16	2	2		1													1
16	3	2		3													
16	4	2		3		4						13					
16	5	2		3													
17	1	2															
17	2	2															
17	3	2									1						
17	4	2															
17	5	2															
18	1	2		6								4					
18	2	2		3		5							1	1	1		
18	3	2		2			2							9	1		
s	4	2		9			1										
18	5	2		5			1				1	12			9		

Fence	Treat	Year	Pla.med	Poa.alp	Poa.ann	Pol.alp	Pol.cha	Pol.viv	Pot.aur	Pot.cra	Pot.ere	Pri.far	Pru.vul	Pul.ver	Ran.acr	Ran.alp	Ran.mon
8	2	2		4				1									
8	3	2		5					3	3	1						
8	4	2		1				6	4	6							2
8	5	2		1				3	3	1		3		1			
9	1	2								2							
9	2	2															
9	3	2		1						2							
9	4	2															
9	5	2		2						2							
10	1	2		7					1	1							
10	2	2															
10	3	2				1											2
10	4	2		2						3							
10	5	2		1		2		1									1
11	1	2								3							
11	2	2					1										
11	3	2						1		13							
11	4	2	2							7							
11	5	2	1		28					16							
12	1	2								6							2
12	2	2					1	1		3							
12	3	2					2			18							
12	4	2	2			2				15							
12	5	2	2			3	2	1		4							
13	1	2								2			4				1
13	2	2								2			1				2
13	3	2															2
13	4	2				1									4		4
13	5	2							1				1		3		
14	1	2								3							
14	2	2	4			1		1		4							2
14	3	2							6	2							1
14	4	2								7							4
14	5	2				1		4		2							1
15	1	2		5											1		8
15	2	2		3													1
15	3	2		3													12
15	4	2															5
15	5	2		10											1		3
16	1	2		17					3								4
16	2	2		13												6	5
16	3	2							5						1		4
16	4	2							3						2		4
16	5	2		7												4	6
17	1	2															4
17	2	2		3													10
17	3	2		5						1							9
17	4	2		7											1		10
17	5	2		2											1		4
18	1	2		8					6	4							1
18	2	2						1									6
18	3	2				4			4								3
s	4	2						2	4						3		6
18	5	2						2									3

Fence	Treat	Year	Sal.her	Sal.ser	San.min	Sca.luc	Sel.sel	Sem.tec	Sen.abr	Ses.cae	Sib.pro	Sil.aca	Sil.nut	Sol.alp	Tar.off	Tha.alp	The.alp	Thy.ser
8	2	2					1			2				2		1		
8	3	2									1			3		2		2
8	4	2				1	1							1		2		1
8	5	2								2		14		1		3		
9	1	2								4								3
9	2	2							12								1	12
9	3	2						2		1								18
9	4	2							5									5
9	5	2																16
10	1	2							16	5						1		14
10	2	2							29				1					8
10	3	2							4	57								
10	4	2								1			1					9
10	5	2							6	38			10				1	2
11	1	2																6
11	2	2								10								1
11	3	2																5
11	4	2																
11	5	2			3								9					4
12	1	2															1	5
12	2	2																7
12	3	2																1
12	4	2															4	
12	5	2															1	7
13	1	2																
13	2	2																
13	3	2																
13	4	2																
13	5	2																
14	1	2								13								11
14	2	2											2					1
14	3	2																
14	4	2																
14	5	2																
15	1	2								12								
15	2	2								23								
15	3	2																
15	4	2								3								
15	5	2																
16	1	2								28				2				
16	2	2					2			46		1		9				
16	3	2					2			21				5				
16	4	2					9			12				10				
16	5	2					4			34				3		12		
17	1	2																
17	2	2																
17	3	2					1				1							
17	4	2																
17	5	2											1					
18	1	2		2			1					4						
18	2	2					4			35				5				
18	3	2																
s	4	2					1											
18	5	2					3			3				2				

Fence	Treat	Year	Tri.pum	Tri.bad	Tri.pra	Tri.rep	Tri.fla	Ver.aph	Ver.cha	Ver.off	Ver.ser	Ver.aph	Vio.bif	Vio.cal	Vio.rup
8	2	2		1		12									
8	3	2		1		9									
8	4	2		22		2									
8	5	2			17										
9	1	2													
9	2	2													
9	3	2													
9	4	2													
9	5	2													
10	1	2													
10	2	2				1					2				
10	3	2			1	2									
10	4	2				2									
10	5	2													
11	1	2				5									
11	2	2													
11	3	2				4									
11	4	2													
11	5	2				17	3								
12	1	2				1			4						
12	2	2													
12	3	2													
12	4	2				3									
12	5	2													
13	1	2				1									
13	2	2				13	5		2						
13	3	2				15	8		6						
13	4	2			7	8	15		8	11					
13	5	2				16	33								
14	1	2													1
14	2	2				2									
14	3	2				1									
14	4	2			10	1									
14	5	2			10	3									
15	1	2				2							4	1	
15	2	2											1		
15	3	2				1									
15	4	2				1							1		
15	5	2				3									
16	1	2												1	
16	2	2													
16	3	2													
16	4	2													
16	5	2													
17	1	2				6									
17	2	2													
17	3	2				3							1		
17	4	2				4							8		
17	5	2				4							1		
18	1	2													
18	2	2			2						1				
18	3	2			1	1							1		
s	4	2													
18	5	2				3		3							