1	Running head: Plant-soil feedback meta-analysis
2	
3	
4	Plant-soil feedbacks: A meta-analytical review
5	
6	Andrew Kulmatiski ^{1*} , Karen H. Beard ¹ and Stephanie Cobbold ²
7	
8	Department of Wildland Resources and the Ecology Center, Utah State University, Logan, UT
9	84322-5230, USA
10	Department of Biology and the Ecology Center, Utah State University, Logan, UT 84322-5305,
11	USA
12	Correspondence: Email: andrewkulmatiski@hotmail.com, Phone: 435-770-9646; Fax: 435-797-
13	3796
14	
15	Type of paper: Review Article
16	Word count: 4205
17	Keywords Meta-analysis, non-native, soil transplant, soil community, succession, invasion,
18	review
19	

ABSTR.	ACT
--------	------------

\mathbf{a}	1
Z	1

22

23

24

25

26

27

28

29

30

31

32

33

34

35

36

37

20

Recent studies suggest that plant-soil feedbacks (PSFs) may provide mechanisms for plant diversity, succession, and invasion. To determine whether there is general support for these hypotheses, we conducted a meta-analysis of PSF experiments, determining effect sizes among plant types, ecosystems, and experimental approaches. Overall, PSFs had a medium negative effect size, indicating that most plants create soils that decrease growth of conspecifics. PSFs were very large and negative for annual and early-successional species, supporting the hypothesis that PSFs maintain diversity by accelerating species replacement (e.g., succession). Across all studies, non-native plants did not benefit from PSFs; however, in studies that measured non-native and native PSFs in the same study system, non-natives did benefit from PSFs. In a comparison of life-forms, grasses demonstrated more negative PSFs than forbs, shrubs, and trees. A review of PSF methodologies showed that experiments using sterilized/inoculated soils, greenhouse conditions, and manipulative experiments to cultivate soils exaggerated PSFs compared to experiments that used whole field soils, field conditions, and natural experiments to cultivate soils, respectively. Our findings provide broad support for the role of PSFs in plant community assembly, but also underscore the need for expanded testing under field conditions.

38

39

40

INTRODUCTION

1	2
4	_

In the last five years, there has been a rapid increase in theoretical and experimental plant-soil feedback (PSF) research. This research has suggested that PSFs are an under-explored factor that can determine plant abundance, persistence, invasion, and succession (Bever 1994, 2003; Callaway *et al.* 2004b; Ehrenfeld 2005; Kardol *et al.* 2007). Because of the growing appreciation for the role of PSFs, it is now possible to use a meta-analytical approach to test theoretical predications regarding the role of PSFs in plant community assembly across species and ecosystem types. However, differences in methodologies among studies require that previously untested biases associated with these methodologies also be examined.

Which species, processes, and ecosystems are most likely to be affected by PSFs?

Research in successional and invaded plant communities has dominated PSF research. Some of the first PSF studies were performed in successional dunegrass communities (van der Putten *et al.* 1988; van der Putten *et al.* 1991). Results from these and subsequent studies have lead to two competing hypotheses regarding the role of PSFs in succession. The first hypothesis grew from the observation that enemy accumulation encourages species replacements. This hypothesis suggests that negative PSFs accelerate succession in early-successional communities while positive feedbacks encourage persistence in late-successional communities (Kardol *et al.* 2006, Kardol *et al.* 2007). Theoretical models of PSFs lend support to this hypothesis because they have demonstrated that negative feedbacks maintain plant diversity as a result of sequential or

reciprocal species re	placements, and	d positive feedbacks	decrease plant	diversity as a	a result of
positive frequency d	ependence (Ber	ver <i>et al</i> . 1997).			

Alternatively, a second hypothesis predicts that PSFs are positive early in succession and become more negative later in succession (Reynolds *et al.* 2003). In this hypothesis, symbioses are assumed to be critical to plant growth in high stress (i.e., early-successional, high latitude, and high altitude) growth conditions (Reynolds *et al.* 2003). As plant growth increases across successional sequences, pathogen accumulation is expected to produce negative PSFs (Reynolds *et al.* 2003). Few studies have explicitly addressed the role of PSFs in successional systems, but many PSF experiments have been performed on early-, mid-, and late-successional plant species. A review of published data, therefore, can be expected to identify patterns of PSFs across successional sequences in a wide array of ecosystems.

PSFs have also gained attention as a mechanism that could explain the abundance and persistence of non-native, invasive plants (Reinhart & Callaway 2006). More specifically, soils in adoptive habitats are expected to be relatively enemy-free and symbiont-rich because root herbivores and pathogens have not co-evolved to specialize on non-native species while common symbionts are generalists (Callaway & Aschehoug 2000). If non-native plants can perpetuate or accentuate these conditions, then a positive, or less negative, PSF will result (Klironomos 2002; Reinhart & Callaway 2004; Kulmatiski *et al.* 2006). Thus, if PSFs are a common mechanism of non-native plant invasion, then invasive plants would be expected to demonstrate positive, or less negative, PSFs than native plants.

As more research addresses the role of PSFs, it is becoming possible to determine whether there is broad support for these hypotheses. In addition, it is becoming possible to determine if PSFs are important for certain plant functional groups or in particular ecosystems.

Up to this point, there has been little discussion of the potential differences in PSFs among different plant functional groups or ecosystems, although it might be expected that there are differences. For example, some plant functional groups, such as annuals or grasses, may be more susceptible to belowground enemies and hence more likely to experience negative PSFs than other functional groups.

Measuring PSFs

PSF research is founded on two concepts: 1) plants cause species-specific changes to soils, and 2) plants demonstrate species-specific responses to these changes (Bever 1994; Ehrenfeld *et al.* 2005). Thus, a PSF experiment incorporates two phases. In Phase I, soils are cultivated by known plant species. In Phase II, plants are grown on self-cultivated (self) and non-self-cultivated (other) soils. The difference in plant growth between these two soil types is a measure of PSF. Researchers have used many different methods to conduct PSF experiments. These different methods were developed to address particular questions but often have limitations (Kulmatiski & Kardol 2007). These methods, therefore, need to be examined to determine if there are consistent methodological biases.

Soils in Phase I, for example, have been cultivated by naturally occurring plants (natural experiment) or by experimentally-grown plants (manipulative experiment). The natural experiment approach reduces the length of the experiment compared to the manipulative approach, and may reflect more natural soil conditions, but is susceptible to uncontrolled differences among sampling sites (Baack *et al.* 2006; Ellis & Weis 2006). Plants in Phase I have been grown in either field-collected soils ('whole' soils) or in homogenized, sterilized soils that

have been inoculated with field soils ('inoculated' soils). Plants are grown on sterilized,
inoculated soils to isolate plant-microbe feedbacks from plant-nutrient feedbacks (Bever 1994).
This approach allows controlled tests of microbial feedbacks, but may not reflect plant-microbe
feedbacks in field soils, because field soils contain large, diverse microbial communities
(Troelstra et al. 2001; Ehrenfeld 2003; Sanchez-Moreno & Ferris 2007).
In Phase II, 'other' soils have been either sterilized soils or soils cultivated by other plant
species. The use of sterilized soils provides information about a plant's relationship to its own
soil, but does not provide information about how different plant species respond to each other's
soils. Plant growth of the target species in Phase II has been measured using a single individual,
multiple individuals, or individuals of the target species within plant communities. Similarly,
most research has measured species-level PSFs, but two recent studies have attempted to
measure whole plant community responses to differently cultivated soils (Kulmatiski et al. 2006;
Kardol et al. 2007). PSFs measured using individual plants or individual species may isolate
PSF effects on that species, but it is not known if PSFs would be smaller or larger in plant
communities.
This study used a meta-analytical approach to address the following questions: 1) Do
early-successional species realize more negative feedbacks than late-successional species? 2) Do
natives realize more negative feedbacks than non-natives? 3) Do PSFs differ among life forms
(i.e., grass, forb, shrub, or tree) or ecosystems? and 4) Do differences in experimental approaches
influence PSFs? More specifically, 5) Do natural and manipulative experiments produce
different PSFs? 6) Do inoculation and self-sterilized techniques over-estimate PSFs? 7) Does
competition in Phase II growth exaggerate PSFs?, and 8) Do single plant species and plant
communities respond similarly to changes in the soil?

METHODS

Our meta-analysis included studies that measured the effects of 'self' and 'other' soils on plant growth of target species. Self soils were soils that were either experimentally cultivated by a target species or field-collected in an area that was described as dominated or co-dominated by the target species. Other soils were soils that have been sterilized or cultivated by non-target plant species. This simple ruleset for data collection provided a robust basis for the meta-analytical approach (Lortie & Callaway 2006).

All manuscripts were located by searching keywords in Web of Science for the terms "plant, soil and feedback", "soil, feedback and experiment", or "plant, soil and transplant", examining references within, and by obtaining unpublished data. We excluded manuscripts that examined only the effects of components of the soil community (e.g., pathogens, fungi, or mycorrhizae), (2) only examined N-fixing species, because these were expected to produce a sampling bias toward positive PSFs, or (3) focused solely on agricultural systems.

We treated experiments where investigators subjected different species to the same treatments, or the same species to different treatments as separate experiments (Gurevitch & Hedges 1999; Gurevitch & Hedges 2001). Different measures on the same experiment were excluded. Aboveground biomass was the most commonly used response variable. Where other response variables were reported, the response variable that linked best to aboveground plant growth was used.

Successional stages were determined using the following rules. Annuals, biennials, and short-lived perennials were defined as early successional; species were defined as mid-successional only if the authors defined them as such; species described as dominant in their

ecosystem were defined as late successional; and species not assigned to any of these classes were defined as unknown. Other classifications, such as life form, ecosystem type, and native or non-native, were derived directly from manuscripts. In a separate analysis conducted only on studies that were performed in the US, plant species were assigned to native, non-native, weedy, and noxious classes according to listings by the USDA Plants Database (http://plants.usda.gov/index.html), which only lists US species. Appendices A and B list the complete dataset.

To determine if plant growth differed between self and other soils, mixed model metaanalyses were performed (Gurevitch & Hedges 2001). For each experiment, we calculated an effect size, Hedges' d (Hedges & Olkin 1985):

$$d = \frac{\overline{X}_{E} - \overline{X}_{C}}{\text{SD}_{\text{pooled}}} J$$

166

where $X_{\mathbb{C}}$ is the mean of growth on 'other' and $X_{\mathbb{E}}$ is the growth on 'self'. The pooled standard deviation is given by:

$$SD_{pooled} = \sqrt{\frac{(n_E - 1)(SD_E)^2 + (n_C - 1)(SD_C)^2}{n_E + n_C - 2}}$$

168

169

170

171

155

156

157

158

159

160

161

162

163

164

165

167

where SD is the standard deviation of the self (E) or other (C) group, and n is the sample size. In the expression for d, J corrects for bias because of different sample sizes by differentially weighting studies as follows:

$$J = 1 - \frac{3}{4(n_{\rm C} + n_{\rm E} - 2) - 1}$$

172

173

174

175

One can think of the effect size d as the difference between the species' growth on their own and other soil, measured in units of standard deviations (analogous to a t statistic). A positive value of d indicates that plants grow better on 'self' soils than on 'other' soils, whereas a

negative d indicates that plants grow better on 'other' soils than 'self' soils. Thus, the direction of d is consistent with the direction of PSFs.

We combined the effect sizes of individual studies to produce a cumulative effect size d_{i+} *, where larger studies are counted more heavily than smaller studies, assuming that larger sample sizes yield more precise results. We used the conventional interpretation of the magnitude of the effect size provided by Cohen (1969), where 0 indicates no effect, 0.2 is a small effect, 0.5 is medium, 0.8 is large, and 1.0 indicates a very large effect. Large differences and low variability generate the largest effect sizes. Effect sizes were judged statistically significant if the 95% confidence intervals of the effect size excluded 0.

We performed a between-class homogeneity statistical test (Q_B^*) to test the null hypothesis that effect sizes were equal among classes against the alternative hypothesis that at least one true effect size was different. We evaluated the statistical significance of the Q_B^* test using a standard chi-squared table. Formula for calculating d_{i+}^* and Q_B^* , are outlined in Gurevitch and Hedges (2001).

RESULTS

The full dataset included 290 experiments from 38 independent studies of which 33 (87%) were conducted after 2001 (Tables 1 and 2). Unless indicated, analyses were conducted using a smaller subset of 276 experiments and 36 studies, and excluded the two studies investigating whole plant community responses, which were analyzed separately. Where possible, analyses were conducted on the subset of studies that included all classes being compared.

199	We found that plants, in general, had a medium, negative effect size ($d_{++} = -0.63$, $n =$
200	276)(Fig. 1). However, effect sizes differed by the length of the plant's life cycle ($Q_B = 16.28$, differed by the length of the plant's life cycle ($Q_B = 16.28$, differed by the length of the plant's life cycle ($Q_B = 16.28$, differed by the length of the plant's life cycle ($Q_B = 16.28$, differed by the length of the plant's life cycle ($Q_B = 16.28$, differed by the length of the plant's life cycle ($Q_B = 16.28$, differed by the length of the plant's life cycle ($Q_B = 16.28$, differed by the length of the plant's life cycle ($Q_B = 16.28$, differed by the length of the plant's life cycle ($Q_B = 16.28$, differed by the length of the plant's life cycle ($Q_B = 16.28$, differed by the length of the plant's life cycle ($Q_B = 16.28$, differed by the length of the plant's life cycle ($Q_B = 16.28$, differed by the length of the plant's life cycle ($Q_B = 16.28$, differed by the length of the plant's life cycle ($Q_B = 16.28$).
201	= 2, $P < 0.001$). Annuals had a very large, negative effect size ($d_{i+} = -1.22$) whereas biennials
202	and perennials had medium, negative effect sizes ($d_{i+} = -0.61$, $d_{i+} = -0.53$, respectively)(Fig. 2A).
203	Most studies were conducted using either forbs or grasses, followed by trees and then
204	shrubs. Grasses had the most negative effect size followed by forbs, shrubs, and trees (Q_B =
205	15.11, df = 3, $P < 0.01$)(Fig. 2A). Most experiments were conducted using species from
206	grassland ecosystems ($n = 197$), but some were conducted using species from forest ($n = 41$),
207	shrub-steppe $(n = 21)$, alpine $(n = 4)$, desert $(n = 2)$, dunegrass $(n = 7)$, and wetland $(n = 4)$
208	ecosystems. Conducting an analysis using only species collected from grassland, forest, and
209	shrub-steppe, we found that effect sizes for species from grasslands were large and negative (d_{i+}
210	= -0.77), whereas effect sizes for species from either forests or shrub-steppe did not differ from
211	zero ($Q_B = 29.88$, $df = 2$, $P < 0.001$).
212	The analysis on successional stage was only conducted on grassland species (215
213	experiments, 22 studies) because of the difficulty in determining successional stage for species in
214	other systems. We found that effect sizes differed by successional stages ($Q_B = 15.92$, $df = 3$, P
215	< 0.01), and that early-successional species had very large, negative effect sizes (d_{i+} = -1.27),
216	mid-successional species had large, negative effect size (d_{i+} = -0.71), and late successional
217	species were not different than zero (Fig 2B).
218	When all studies were included, the effect size of natives ($d_{i+} = -0.62$, $n = 194$) and non-
219	natives (d_{i+} = -0.64, n = 82) were medium and negative, and not significantly different from one
220	another ($Q_B = 0.04$, df = 1, $P > 0.05$). However, when the analysis was only performed on the
221	11 studies that included both natives and non-natives, natives demonstrated a large, negative

effect size ($d_{i+} = -0.95$, n = 96) compared to the medium negative effect size of non-natives ($d_{i+} =$ 222 -0.58, n = 74) (Q_B = 5.06, df = 1, P < 0.05). When the same dataset was restricted to natives and 223 224 non-natives, which could be categorized as non-native, weedy, or noxious (137 experiments, 5 225 studies), we found that there was a difference between classes with natives having a large, 226 negative effect size ($d_{i+} = -1.12$) compared to noxious weeds having only a medium, negative 227 effect size $(d_{i+} = -0.48)(Q_B = 9.01, df = 3, P < 0.05)(Fig. 2B)$. 228 Experimental approaches greatly influenced effect sizes. For example, a test conducted 229 on the importance of experimental venue showed that effect sizes were medium and negative in the greenhouse ($d_{i+} = -0.68$) whereas effect sizes for experiments performed in the field did not 230 231 differ from zero ($Q_B = 10.60$, df = 1, P < 0.01)(Fig 3A). 232 We also determined that effect sizes differed depending on whether the cultivation of soil 233 in Phase I was a manipulative or natural experiment; effect sizes were larger for manipulative $(d_{i+} = -0.80)$ than natural experiments $(d_{i+} = -0.36)(Q_B = 13.43, df = 1, P < 0.001)$ (Fig 3A). We 234 235 conducted a test to determine if the media used in Phase I, whether sterilized and inoculated or 236 whole soil, influenced effect size. We found that inoculated media had a large, negative effect size $(d_{i+} = -0.79)$, whereas whole soil had a medium, negative effect size $(d_{i+} = -0.52)$ (Q_B = 4.45, 237 238 df = 1, P < 0.05)(Fig 3B). 239 We also compared how the "self-other" and "self-sterilized" methods influenced effect size. Both approaches produced negative effect sizes ($d_{i+} = -0.61$ and -0.70; n = 219 and n = 57, 240 241 respectively) and were not significantly different ($Q_B = 0.35$, df = 1, P > 0.05). However, when 242 a comparison of the techniques was made using only the studies that performed both techniques

(89 experiments, 10 studies), the "self-sterilized" method had a medium, negative effect size (d_{i+}

243

= -0.65), whereas the "self-other" method had an effect size that did not differ from zero (Q_B = 244 5.62, df = 1, P < 0.05)(Fig 3B). 245 We determined that plant neighborhood in Phase II influenced effect size ($Q_B = 21.23$, df 246 = 2, P < 0.001). Studies that measured Phase II plant growth using multiple individuals per 247 248 experimental unit (intraspecific competition) demonstrated very large, negative effect sizes (d_{i+} = 249 -1.07) compared to studies that measured plant growth using a single individual per experimental 250 unit ($d_{i+} = -0.47$) or studies that measured plant growth in the presence of other species 251 (interspecific competition; $d_{i+} = -0.42$)(Fig 3B). 252 Only two studies measured whole plant community responses to soil differences, and effect sizes were not different from zero (n = 14), even though studies measuring species-level 253 responses had medium, negative effect sizes (d_{i+} = -0.63, n = 276) (Q_B = 7.28, df = 1, P < 0.01). 254 255 256 257 **DISCUSSION** 258 259 Most plants and all treatment classes realized negative or neutral PSFs. As a result, the average 260 effect size of PSFs on plant growth was -0.63. This effect size on plant growth was larger than 261 those observed in meta-analyses of leaf-litter addition (Xiong & Nilsson 1999), seed limitation (Clark et al. 2007), and seed feeders (Morris et al. 2007); similar to those observed in meta-262 263 analyses of aboveground herbivores, total herbivores, viruses, leaf chewers, root feeders (Morris 264 et al. 2007), and soil warming (Rustad et al. 2001); and smaller than those observed in meta-265 analyses of biotic resistance (Levine et al. 2004), belowground herbivores, pathogens,

pathogenic fungi, and nematodes (Morris et al. 2007).

266

PSFs may be even more important than suggested by these comparisons because both positive (25% of experiments) and negative PSFs were observed, while most effect sizes in other meta-analyses were in one direction. For example, competitors rarely facilitated growth in the meta-analysis of biotic resistance so nearly all effect sizes of biotic resistance were negative (Levine *et al.* 2004). The absolute value of effect size provides an estimate of effect size that is not affected by the sign of the value. The average absolute value of effect sizes in this meta-analysis was 1.24, which is comparable to the effect of biotic resistance (Levine *et al.* 2004). In summary, this review indicates that, relative to many other plant growth factors, PSFs are important.

Plant types

Annuals and early-successional species realized very large negative PSFs and perennials and late-successional species realized significantly less negative PSFs. This contradicts the hypothesis that PSFs will become more important and more negative across successional sequences (Reynolds *et al.* 2003), and provides widespread support for the hypothesis that negative PSFs increase the rate of succession (Van der Putten 1997; Kardol *et al.* 2007). Because early-successional species, which typically demonstrate the greatest maximum growth rates, were found to be most susceptible to negative PSFs, the results also support the idea that there is an inherent trade-off between enemy defense and fast growth rates, as has been observed in above-ground systems (Coley *et al.* 1985).

In the comparisons of PSFs among different plant life-forms and ecosystems, we found that grasses and grasslands demonstrated the most negative effect sizes. To explain grass

sensitivity to belowground enemies, we suggest that high growth rates, high root:shoot ratios, greater root longevity, and a larger proportion of roots near the soil surfaces increase grass exposure to belowground enemies (Gleeson & Tilman 1994; Schenk & Jackson 2002; Wilsey & Polley 2006). Because woody plants did not have large negative PSFs (this study), and they are not as affected by biotic resistance (Levine *et al.* 2004) or pathogens (Morris *et al.* 2007), woody plants appear to be less sensitive to belowground enemies and competitors than herbaceous plants.

Non-native plants

Identifying mechanisms of non-native plant success is a central theme in invasion ecology. Several studies suggest that PSFs may explain how non-native, invasive plants maintain dense, persistent populations (Klironomos 2002; Agrawal *et al.* 2005; Kulmatiski 2006; Reinhart & Callaway 2006). This review, however, found that non-natives, in general, do not benefit from PSFs relative to natives. It should be noted, however, that non-natives were comprised of a larger proportion of early-successional species (90%) than natives (47%). Thus, because early-successional species demonstrated some of the most negative PSFs, non-native PSFs were actually less negative than expected based on their successional stage. Because species with less negative PSF are thought to outcompete species with more negative PSFs (Bever *et al.* 1997; Eppstein & Molofsky 2007), this suggests that non-natives are more likely to invader early-successional native communities than in late-successional native communities.

To better control our test of PSFs among native and non-native species, we conducted an analysis that included only studies with data for natives and non-natives in the same system

(Lortie & Callaway 2006). Most studies excluded from this conservative dataset examined
natives (88%). After removing these studies, the effect size for native plants was more negative.
This could not be explained by a difference in the proportion of annuals and perennials because
natives were represented by 20 and 24% annuals and 74 and 74% perennials in the conservative
and full datasets, respectively. For non-natives, effect size did not differ between the two
datasets. The fact that natives had more negative effect sizes in studies that included both native
and non-native species indicates that invasion success may be a function of the invaded
community and not the invasive plant.

When we further divided this analysis to distinguish PSFs realized by non-native, weedy, and noxious plants from PSFs realized by native plants, we found that noxious non-natives, those of the greatest concern, had the least negative effect sizes. Thus, to summarize, in general native and non-native plant effect sizes do not differ, but in studies that examine both natives and non-natives, native communities are more susceptible to invasion (i.e., have more negative effect sizes). Within these communities, the worst invaders benefit the most from PSFs.

Results from this meta-analysis and other reviews of plant invasions indicate that invasion success is correlated with early-successional plant traits (Rejmanek 1996; Reichard & Hamilton 1997; Prinzing *et al.* 2002). This raises an interesting question: why would species with the most negative PSFs, and therefore, the least ability to maintain dense, persistent populations become the most successful invaders? We suggest that early-successional species have the most to gain from enemy release because growth of these species is controlled by enemies. In contrast, late-successional species are likely to dedicate large amounts of resources to constitutive defenses. These defenses should decrease the benefit of release from enemies and also preclude rapid growth responses.

Implications of different experimental methods

Controlled experiments produced different results than less-controlled, more natural experiments. More specifically, experiments using sterilized soil, inoculated soil, and greenhouse conditions produced larger effect sizes than experiments using 'other' soil, whole field soil, and field conditions, respectively. Similarly, the manipulative-experiment method produced larger effect sizes than the natural-experiment method. Highly controlled experiments have similarly been found to produce larger effect sizes in studies of enemy and mutualist effects on plants (Morris *et al.* 2007). These findings contradict the suggestion that PSFs will be more important in microbially-rich soils (Reynolds *et al.* 2003). Rather, it appears that microbially-rich soils provide functional redundancy and disease suppressiveness that minimizes the importance of PSFs (Sanchez-Moreno & Ferris 2007).

Plant community-level PSFs

Plant communities were used in two types of feedback experiments. In the first type, species-level responses of plants grown alone, in monocultures (intraspecific competition), or in mixed communities (interspecific competition) were compared. PSFs of plants grown in monocultures produced the largest (i.e., most negative) feedback effects. This suggests that intraspecific competition exaggerates PSFs relative to PSFs measured on plants grown alone or with other species (Kardol *et al.* 2007).

In the second type, PSFs were assessed using whole plant communities (Kulmatiski *et al.* 2006; Kardol *et al.* 2007). These studies measured the biomass response of all plant species grown on self and other soils. Conclusions drawn from two studies should be taken with caution, but community-level PSFs produced the only class of data for which the mean effect size was positive (0.22), though not significantly different from zero. In contrast, species-level PSFs, as already described, were medium and negative (-0.63).

PSF models of interacting species provide some insight into why community-level responses may be less negative than species-level responses. Bever *et al.* (1997) demonstrated that for two species to coexist plant growth on 'other' soil had to be greater than plant growth on 'self' soil, otherwise the species that benefits most from its own growth will competitively exclude the other. From this, we might expect that co-existing species in a community grow better than species in a monoculture. Our data supports the idea that community-level PSF are less negative than individual-level PSFs.

CONCLUSIONS

Plants, in general, realized negative PSFs. Negative PSFs are predicted to encourage species replacements and therefore increase plant diversity and successional processes. Consistent with these model predictions, we found that annual and early-successional species realized the most negative PSFs. Among plant types, grasses and grasslands realized the most negative PSFs. We suggest that this may reflect greater growth rates and exposure to belowground enemies, though further research is needed to address these hypotheses. Non-native plants, in general, did not

381	benefit from PSFs, though they did demonstrate less negative PSFs than native plants in the
382	systems that they invade.
383	We also found that controlled experimental conditions produced large and negative effect
384	sizes relative to more natural conditions. We suggest that PSFs measured in controlled
385	conditions are likely to differ from PSFs measured in the field for two reasons. First, microbial
386	communities in the field are large and diverse relative to the small microbial communities used
387	as inocula in controlled experiments. Second, plants in the field grow in communities, not
388	monocultures. Both these conditions are likely to produce less negative effect sizes in the field.
389	Thus, formal tests of PSFs under field conditions are needed to provide a link between a growing
390	body of theoretical and greenhouse-derived data, and plant growth on the landscape.
391 392	
393	ACKNOWLEGEMENTS
394	We thank the following authors for providing data A. Agrawal, G. De Deyn, P. Kardol, J.
395	Klironomos, P. Meiman, C. Puerta-Pinero, S. Troelstra, and W. van der Putten. We thank A.
396	Croft for assistance with this project. A. Kulmatiski was funded by the Department of Wildland
397	Resources, College of Natural Resources, and USU Ecology Center, and support was received by
398	the Utah Agricultural Experimental Station.
399	
400	
401	LITERATURE CITED
402	Agrawal A.A., Kotanen P.M., Mitchell C.E., Power A.G., Godsoe W. & Klironomos J. (2005)
403	Enemy release? An experiment with congeneric plant pairs and diverse above- and
404	belowground enemies. Ecology, 86, 2979-2989

405	Baack E.J., Emery N.C. & Stanton M.L. (2006) Ecological factors limiting the distribution of
406	Gilia tricolor in a California grassland mosaic. Ecology, 87, 2736-2745
407	Beckstead J. & Parker I.M. (2003) Invasiveness of Ammophila arenaria: Release from soil-borne
408	pathogens? Ecology, 84, 2824-2831
409	Belnap J., Phillips S.L., Sherrod S.K. & Moldenke A. (2005) Soil biota can change after exotic
410	plant invasion: does this affect ecosystem processes? Ecology, 86, 3007-3017
411	Bever J.D. (1994) Feedback between plants and their soil communities in an old field
412	community. <i>Ecology</i> , 75, 1965-1977
413	Bever J.D. (2003) Soil community feedback and the coexistence of competitors: conceptual
414	frameworks and empirical tests. New Phytologist, 157, 465-473
415	Bever J.D., Westover K.M. & Antonovics J. (1997) Incorporating the soil community into plant
416	population dynamics: the utility of the feedback approach. Journal of Ecology, 85, 561-
417	573
418	Bezemer T.M., Harvey J.A., Kowalchuk G.A., Korpershoek H. & Van der Putten W.H. (2006a)
419	Interplay between Senecio jacobaea and plant, soil, and aboveground insect community
420	composition. Ecology, 87, 2002-2013
421	Bezemer T.M., Lawson C.S., Hedlund K., Edwards A.R., Brook A.J., Igual J.M., Mortimer S.R.
422	& Van der Putten W.H. (2006b) Plant species and functional group effects on abiotic and
423	microbial soil properties and plant-soil feedback responses in two grasslands. Journal of
424	Ecology, 94, 893-904
425	Bodelier P.L.E., Stomp M., Santamaria L., Klaassen M. & Laanbroek H.J. (2006) Animal-plant-
426	microbe interactions: direct and indirect effects of swan foraging behaviour modulate
427	methane cycling in temperate shallow wetlands. Oecologia, 149, 233-244

428	Bonanomi G. & Mazzoleni S. (2005) Soil history affects plant growth and competitive ability.
429	Community Ecology, 6, 23-28
430	Bonanomi G., Rietkerk M., Dekker S.C. & Mazzoleni S. (2005) Negative plant-soil feedback
431	and positive species interaction in a herbaceous plant community. Plant Ecology, 181,
432	269-278
433	Callaway R.M. & Aschehoug E.T. (2000) Invasive plants versus their new and old neighbors: A
434	mechanism for exotic invasion. Science, 290, 521-523
435	Callaway R.M., Thelen G.C., Barth S., Ramsey P.W. & Gannon J.E. (2004a) Soil fungi alter
436	interactions between the invader Centaurea maculosa and North American natives.
437	Ecology, 85, 1062-1071
438	Callaway R.M., Thelen G.C., Rodriguez. A. & Holben W.E. (2004b) Soil biota and exotic plant
439	invasion. Nature, 427, 731-733
440	Casper B.B. & Castelli J.P. (2007) Evaluating plant-soil feedback together with competition in a
441	serpentine grassland. Ecology Letters, 10, 394-400
442	Clark C.J., Poulsen J.R., Levey D.J. & Osenberg C.W. (2007) Are plant populations seed
443	limited? A critique and meta-analysis of seed addition experiments. American Naturalist
444	170, 128-142
445	Cohen J. (1969) Statistical power analysis for the behavioral sciences. Academic Press, New
446	York.
447	Coley P.D., Bryant J.P. & Chapin F.S. (1985) Resource availability and plant antiherbivore
448	defense. Science, 230, 895-899
449	De Deyn G.B., Raaijmakers C.E. & Van der Putten W.H. (2004) Plant community development
450	is affected by nutrients and soil biota. Journal of Ecology, 92, 824-834

451	Ehlers B.K. & Thompson J. (2004) Do co-occurring plant species adapt to one another? The
452	response of Bromus erectus to the presence of different Thymus vulgaris chemotypes.
453	Oecologia, 141, 511-518
454	Ehrenfeld J.G. (2003) Effects of exotic plant invasions on soil nutrient cycling processes.
455	Ecosystems, 6, 503-523
456	Ehrenfeld J.G., Ravit B. & Elgersma K. (2005) Feedback in the plant-soil system. <i>Annual Review</i>
457	of Environment and Resources, 30, 75-115
458	Ellis A.G. & Weis A.E. (2006) Coexistence and differentiation of 'flowering stones': the role of
459	local adaptation to soil microenvironment. Journal of Ecology, 94, 322-335
460	Eppstein M.J. & Molofsky J. (2007) Invasiveness in plant communities with feedbacks. <i>Ecology</i>
461	Letters, 10, 253-263
462	Gillespie I.G. & Allen E.B. (2006) Effects of soil and mycorrhizae from native and invaded
463	vegetation on a rare California forb. Applied Soil Ecology, 32, 6-12
464	Gurevitch J. & Hedges L.V. (1999) Statistical issues in ecological meta-analyses. <i>Ecology</i> , 80,
465	1142-1149
466	Gurevitch J. & Hedges L.V. (2001) Meta-analysis: combining the results of independent
467	experiments. In: Design and Analysis of Ecological Experiments (eds. Scheiner SM &
468	Gurevitch J), pp. 347-369. Oxford Press, Oxford
469	Gustafson D.J. & Casper B.B. (2004) Nutrient addition affects AM fungal performance and
470	expression of plant/fungal feedback in three serpentine grasses. Plant and Soil, 259, 9-17
471	Hedges L.V. & Olkin I. (1985) Statistical methods for meta-analysis. Academic Press, San
472	Diego.

473	Holah J.C. & Alexander H.M. (1999) Soil pathogenic fungi have the potential to affect the co-
474	existence of two tallgrass prairie species. Journal of Ecology, 87, 598-608
475	Kardol P., Bezemer T.M. & van der Putten W.H. (2006) Temporal variation in plant-soil
476	feedback controls succession. Ecology Letters, 9, 1080-1088
477	Kardol P., Cornips N.J., Van Kempen M.L., Bakx-Shotman J.M. & Van der Putten W.H. (2007)
478	Microbe-mediated plant-soil feedback causes historical contingency effects in plant
479	community assembly. Ecological Monographs, 77, 147–162
480	Klironomos J.N. (2002) Feedback with soil biota contributes to plant rarity and invasiveness in
481	communities. Nature, 417, 67-70
482	Knevel I.C., Lans T., Menting F.B.J., Hertling U.M. & van der Putten W.H. (2004) Release from
483	native root herbivores and biotic resistance by soil pathogens in a new habitat both affect
484	the alien Ammophila arenaria in South Africa. Oecologia, 141, 502-510
485	Kulmatiski A. (2006). Exotic plants establish persistent communities. <i>Plant Ecology</i> . 187:261-
486	275.
487	Kulmatiski A., Beard K.H. & Stark J.M. (2006) Soil history as a primary control on plant
488	invasion in abandoned agricultural fields. Journal of Applied Ecology, 43, 868-876
489	Kulmatiski A. & Kardol P. (2007) Getting plant-soil feedbacks out of the greenhouse:
490	experimental and conceptual approaches. In: Progress in Botany vol. 69 (eds. Esser K,
491	Lüttge UE, Beyschlag W & Murata J). Springer
492	Levine J.M., Adler P.B. & Yelenik S.G. (2004) A meta-analysis of biotic resistance to exotic
493	plant invasions. Ecology Letters, 7, 975-989
494	Lortie C.J. & Callaway R.M. (2006) Re-analysis of meta-analysis: support for the stress-gradient
495	hypothesis. Journal of Ecology, 94, 7-16

196	Meiman P.J., Redente E.F. & Paschke M.W. (2006) The role of native soil community in the
197	invasion ecology of spotted (Centaurea maculosa auct. non Lam.) and diffuse
198	(Centaurea diffusa Lam.) knapweed. Applied Soil Ecology, 32, 77-88
199	Morris C., Call C.A., Monaco T.A., Grossl P.R. & Dewey S.A. (2006) Evaluation of elemental
500	allelopathy in Acroptilon repens (L.) DC. (Russian Knapweed). Plant and Soil, 289, 279-
501	288
502	Morris W.F., Hufbauer R.A., Agrawal A.A., Bever J.D., Borowicz V.A., Gilbert G.S., Maron
503	J.L., Mitchell C.E., Parker I.M., Power A.G., Torchin M.E. & Vazquez D.P. (2007)
504	Direct and interactive effects of enemies and mutualists on plant performance: a meta-
505	analysis. <i>Ecology</i> , 88, 1021-1029
506	Niu Hb., Liu Wx., Wan Fh. & Liu B. (2007) An invasive aster (Ageratina adenophora)
507	invades and dominates forest understories in China: altered soil microbial communities
508	facilitate the invader and inhibit natives. Plant and Soil
509	Packer A. & Clay K. (2000) Soil pathogens and spatial patterns of seedling mortality in a
510	temperate tree. Nature, 404, 278-281
511	Peltzer D.A. (2001) Plant responses to competition and soil origin across a prairie-forest
512	boundary. Journal of Ecology, 89, 176-185
513	Prinzing A., Durka W., Klotz S. & Brandl R. (2002) Which species become aliens? Evolutionary
514	Ecology Research, 4, 385-405
515	Puerta-Pinero C., Gomez J.M. & Zamora R. (2006) Species-specific effects on topsoil
516	development affect Quercus ilex seedling performance. Acta Oecologica, 29, 65-71
517	Reichard S.H. & Hamilton C.W. (1997) Predicting invasions of woody plants introduced into
518	North America. Conservation Biology, 11, 193-203

519	Reinhart K.O. & Callaway R.M. (2004) Soil biota facilitate exotic Acer invasions in Europe and
520	North America. Ecological Applications, 14, 1737-1745
521	Reinhart K.O. & Callaway R.M. (2006) Soil biota and invasive plants. New Phytologist, 170,
522	445-457
523	Reinhart K.O., Greene E. & Callaway R.M. (2005a) Effects of Acer platanoides invasion on
524	understory plant communities and tree regeneration in the northern Rocky Mountain.
525	Ecography, 28, 573-582
526	Reinhart K.O., Packer A., Van der Putten W.H. & Clay K. (2003) Plant-soil biota interactions
527	and spatial distribution of black cherry in its native and invasive ranges. Ecology Letters
528	6, 1046-1050
529	Reinhart K.O., Royo A.A., Van der Putten W.H. & Clay K. (2005b) Soil feedback and pathogen
530	activity in Prunus serotina throughout its native range. Journal of Ecology, 93, 890-898
531	Rejmanek M. (1996) A theory of seed plant invasiveness: The first sketch. Biological
532	Conservation, 78, 171-181
533	Reynolds H.L., Packer A., Bever J.D. & Clay K. (2003) Grassroots ecology: plant-microbe-soil
534	interactions as drivers of plant community structure and dynamics. Ecology, 84, 2281-
535	2291
536	Rustad L.E., Campbell J.L., Marion G.M., Norby R.J., Mitchell M.J., Hartley A.E., Cornelissen
537	J.H.C. & Gurevitch J. (2001) A meta-analysis of the response of soil respiration, net
538	nitrogen mineralization, and aboveground plant growth to experimental ecosystem
539	warming. Oecologia, 126, 543-562
540	Sanchez-Moreno S. & Ferris H. (2007) Suppressive service of the soil food web: Effects of
541	environmental management. Agriculture Ecosystems & Environment, 119, 75-87

542	Schenk H.J. & Jackson R.B. (2002) Rooting depths, lateral root spreads and below-
543	ground/above-ground allometries of plants in water-limited ecosystems. Journal of
544	Ecology, 90, 480-494
545	Suding K., Larson J., Thorsos E., Steltzer H. & Bowman W. (2004) Species effects on resource
546	supply rates: do they influence competitive interactions? Plant Ecology, 175, 47-58
547	Suguenza C., Corkidi L. & Allen E.B. (2006) Feedbacks of soil inoculum of mycorrhizal fungi
548	altered by N deposition on the growth of a native shrub and an invasive annual grass.
549	Plant and Soil, 286, 153-165
550	Troelstra S.R., Wagenaar R., Smant W. & Peters B.A.M. (2001) Interpretation of bioassays in
551	the study of interactions between soil organisms and plants: involvement of nutrient
552	factors. New Phytologist, 150, 697-706
553	Van der Putten W.H. (1997) Plant-soil feedback as a selective force. Trends in Ecology &
554	Evolution, 12, 169-170
555	Van der Putten W.H., Kowalchuk G.A., Brinkman E.P., Doodeman G.T.A., Van der Kaaij R.M.,
556	Kamp A.F.D., Menting F.B.J. & Veenendaal E.M. (2007) Soil feedback of exotic
557	savanna grass relates to pathogen absence and mycorrihizal selectivity. Ecology, 88, 978-
558	988
559	Van der Stoel C.D., van der Putten W.H. & Duyts H. (2002) Development of a negative plant-
560	soil feedback in the expansion zone of the clonal grass Ammophila arenaria following
561	root formation and nematode colonization. Journal of Ecology, 90, 978-988
562	Wilsey B.J. & Polley H.W. (2006) Aboveground productivity and root-shoot allocation differ
563	between native and introduced grass species. Oecologia, 150, 300-309

564	Xiong S. & Nilsson C. (1999) The effects of plant litter on vegetation: a meta-analysis. <i>Journal</i>
565	of Ecology, 87, 984-994
566 567	

Table 1. Studies included in the meta-analyses and the number of experiments (means, standard deviations, and sample size for control and experimental groups) extracted from each paper.

Study	Reference	Experiments
1	Agrawal et al. 2005	20
2	Beckstead and Parker 2003	1
3	Belnap et al. 2005	2
4	Bever 1994	12
5	Bezemer et al. 2006a	2
6	Bezemer et al. 2006b	13
7	Bodelier et al. 2006	4
8	Bonanomi and Mazzoleni 2005a	11
9	Bonanomi et al. 2005b	1
10	Callaway <i>et al.</i> 2004a	1
11	Callaway et al. 2004b	8
12	Casper and Castelli 2007	6
13	De Deyn et al. 2004a	13
14	Ehlers and Thompson 2004	1
15	Gillespie and Allen 2006	3
16	Gustafson and Casper 2004	6
\17	Holah and Alexander 1999	4
18	Kardol et al. 2006	12
19	Kardol et al. 2007	42
20	Klironomos 2002	61
21	Knevel et al. 2004	1
22	Kulmatiski et al. 2006	2
23	Kulmatiski unpublished data	6
24	Meiman et al. 2006	1
25	Morris et al. 2006	1
26	Niu et al 2007	8
27	Packer and Clay 2000	4
28	Peltzer 2001	2
29	Puerta-Pinero et al. 2006	7
30	Reinhart and Callaway 2004	10
31	Reinhart et al. 2003	8
32	Reinhart et al. 2005a	2
33	Reinhart et al. 2005b	2 2
34	Suding et al. 2004	4
35	Suguenza et al. 2006	1
36	Troelstra et al. 2001	4
37	Van der Putten et al. 2007	3
38	Van der Stoel et al. 2002	1
_	Total =	= 290

571

568569570

Table 2. List of references, species origin, the growth form, successional stage, experimental venue, habitat where species were collected, experimental approach (self-other, self-sterilized), whether the test was natural or manipulative, inoculum or whole soil approach, cultivation by monoculture or community in Phase I, length of Phase II, Phase II neighborhood, which indicates whether there was competition, and the response variable measured for each of the 286 experiments. Because some studies had multiple experiments, in some cases, there were multiple treatment levels within a study and these are presented with a backslash.

Species origin(s), Growth form(s), Successional stage(s), Experimental setting, Habitat, Approach(s),
Natural or Manipulative, Inoculum or Whole soil, Phase I Cultivation, Phase II Neighborhood,
Response Variable
Native/Non-native, Perennial grass/Annual forb/Biennial forb/Perennial forb, Early/Middle/Late/Unknown,
Greenhouse, Grassland, Self-other, Manipulative, Whole soil, Monoculture, Alone, Aboveground
Non-native, Perennial grass, Early, Greenhouse, Dune grass, Self-sterilized, Field, Whole soil, Monoculture,
Intra-specific, Aboveground
Native, Perennial grass, Unknown, Greenhouse, Desert, Self-other, Field, Whole soil, Monoculture, Intra-
specific, Aboveground
Native, Perennial grass, Late, Greenhouse, Grassland, Self-other/Self-sterilized, Manipulative, Inoculum,
Monoculture, Intra-specific, Total biomass
Native, Biennial forb, Early, Greenhouse, Grassland, Self-other, Manipulative, Inoculum, Community, Alone,
Total biomass
Native, Perennial grass, Biennial forb, Middle/Late/Unknown, Greenhouse, Grassland, Self-other,
Manipulative, Whole soil, Monoculture, Alone, Total biomass
Non-native, Perennial forb, Unknown, Greenhouse, Wetland, Self-sterilized, Field, Whole soil, Community,
Alone/Intraspecific, Total biomass
Native, Perennial grass/Perennial forb/Perennial shrub, Late/Unknown, Greenhouse, Grassland, Self-other,
Manipulative, Whole soil, Monoculture, Alone/Intraspecific/Interspecific, Total biomass
Native, Perennial grass, Late, Greenhouse, Grassland, Self-Other, Field, Whole soil, Monoculture, Alone,
Total biomass
Non-native, Biennial forb, Early, Greenhouse, Grassland, Self-Other, Field, Inoculum, Community, Alone,
Aboveground
Native/Non-native, Biennial forb, Early, Greenhouse, Grassland, Self-other/Self-sterilized,
Manipulative/Field, Inoculum, Community/Monoculture, Intra-specific, Aboveground
Native, Perennial grass, Middle/Late, Field, Grassland, Self-other, Field, Whole soil, Community,
Alone/Inter-specific, Aboveground
Native, Annual forb/Perennial grass/Perennial forb, Early/Middle/Late, Greenhouse, Grassland, Self-

	Sterilized, Field, Whole soil, Community, Inter-specific, Aboveground
	Native, Perennial grass, Unknown, Field, Grassland, Self-other, Field, Whole soil, Community, Intra-specific,
Ehlers & Thompson 2004	Aboveground
	Native, Annual forb, Early, Greenhouse, Grassland, Self-other/Self-sterilized, Field, Inoculum,
Gillespie & Allen 2006	Community/Monoculture, Alone, Aboveground
	Native, Perennial grass, Middle/Late, Greenhouse, Grassland, Self-other, Field, Inoculum, Community,
Gustafson & Casper 2004	Alone, Total biomass
	Native, Annual forb/Perennial grass, Early/Middle, Greenhouse, Grassland, Self-other/Self-sterilized, Field,
Holah & Alexander 1999	Inoculum, Community, Alone, Height/Number of leaves
	Native, Community, Early/Middle/Late, Greenhouse, Grassland, Self-other, Manipulative/Field, Inoculum,
Kardol et al. 2006	Community, Inter-specific, Aboveground
	Native, Annual grass/Annual forb/Perennial grass, Early, Greenhouse, Grassland, Self-other, Manipulative,
Kardol <i>et al</i> . 2007	Inoculum, Monoculture, Intra-specific/Interspecific, Aboveground/Total biomass
	Native/Non-native, Perennial grass/Biennial forb/Perennial forb, Early/Middle/Unknown, Greenhouse,
Klironomos 2002a	Grassland, Self-other, Manipulative, Whole soil, Monoculture, Alone, Total biomass
	Native, Perennial grass, Early, Greenhouse, Dune grass, Self-sterilized, Field, Inoculum, Monoculture, Alone,
Knevel et al. 2004	Total biomass
	Native/Non-native, Community, Middle/Late, Field, Shrub steppe, Self-other, Field, Whole soil, Community,
Kulmatiski <i>et al.</i> 2006	Community, Plant cover
	Native/Non-native, Annual grass Perennial grass/Biennial forb/Perennial forb, Early/Middle/Late/Unknown,
Kulmatiski, unpubl. Data	Field, Grassland, Self-other, Field, Whole soil, Community, Community, Aboveground
	Non-native, Biennial forb, Early, Greenhouse, Grassland, Self-other, Field, Whole soil, Community, Alone,
Meiman et al. 2006	Total biomass
	Non-native, Perennial forb, Unknown, Greenhouse, Grassland, Self-other, Field, Whole soil, Monoculture,
Morris et al. 2006	Alone, Total biomass
	Native/Non-native, Perennial forb/Perennial grass/Perennial shrub, Early/Unknown, Greenhouse, Forest, Self-
Niu <i>et al</i> . 2007	other/Self-sterilized, Field, Inoculum, Community, Intra-specific, Total biomass
	Native, Perennial tree, Unknown, Greenhouse, Forest, Self-sterilized, Manipulative/Field, Inoculum,
Packer & Clay 2000	Community, Alone, Aboveground
	Native, Annual grass, Early, Field, Grassland, Self-other, Field, Whole soil, Community, Alone/Interspecifc,
Peltzer 2001	Growth
	Native, Perennial tree, Late/Unknown, Greenhouse, Forest, Self-other/Self-sterilized, Field, Whole soil,
Puerta-Pinero et al. 2006	Monoculture, Alone, Total biomass
Reinhart & Callaway 2004	Native/Non-native, Perennial tree, Unknown, Greenhouse, Forest, Self-other/Self-sterilized, Field, Inoculum,

	Community, Alone, Total biomass
	Native/Non-native, Perennial tree, Middle/Unknown, Greenhouse, Forest, Self-other/Self-sterilized, Field,
Reinhart et al. 2003	Inoculum, Community, Alone/Intra-specific, Aboveground
	Native, Perennial tree, Middle/Unknown, Greenhouse, Forest, Self-other/Self-sterilized, Field, Inoculum,
Reinhart et al. 2005b	Community, Intra-specific, Seedling survival %
	Native/Non-native, Perennial tree, Middle/Late, Field, Forest, Self-other, Field, Whole soil, Community,
Reinhart et al. 2005a	Inter-specific, Aboveground
	Native, Perennial grass/Perennial forb, Late, Field, Alpine, Self-other, Field, Whole soil, Community, Intra-
Suding et al. 2004	specific/Inter-specific, Relative abundance/Relative growth
	Native, Perennial shrub, Late, Greenhouse, Shrub steppe, Self-sterilized, Field, Inoculum, Community, Alone,
Suguenza et al. 2006	Total biomass
	Native, Perennial grass, Unknown, Greenhouse, Dune grass, Self-sterilized, Field, Whole, Community,
Troelstra et al. 2001	Alone, Total biomass
	Native/Non-native, Annual grass/Perennial grass, Early/Late, Greenhouse, Grassland, Self-sterilized, Field,
Van der Putten et al. 2007	Inoculum, Monoculture, Intra-specific, Aboveground
	Native, Perennial grass, Early, Greenhouse, Dune grass, Self-sterilized, Field, Inoculum, Monoculture, Intra-
Van der Stoel et al. 2002	specific, Relative total biomass

Figure Legends

- Figure 1. Number of plant-soil feedback experiments by effect size. Negative effect sizes suggest that plants grow better on 'other' than on 'self' cultivated soil.

 Three outliers beyond -6 are not shown (n = 290 experiments).
- Figure 2. Effect sizes for experiments separated into (a) length of life cycle and life form classes, and (b) successional stage and species origin. Sample sizes are indicated at the top.
- Figure 3. Effect sizes for experiments separated into (a) experimental approach, whether the soils in Phase I are cultivated through a manipulative or natural experiment, and experimental venue, and (b) soil media or volume used in Phase I, soil cultivation method, and target species neighborhood in Phase II. Sample sizes are indicated at the top.

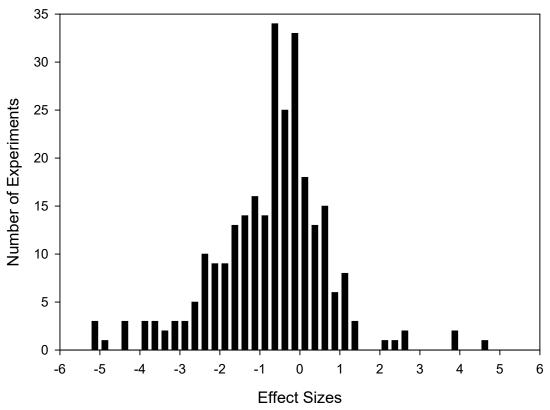


Figure 1. Number of plant-soil feedback experiments by effect size. Negative effect sizes suggest that plants grow better on 'other' than on 'self' cultivated soil. Three outliers beyond -6 are not shown (n = 290 experiments).

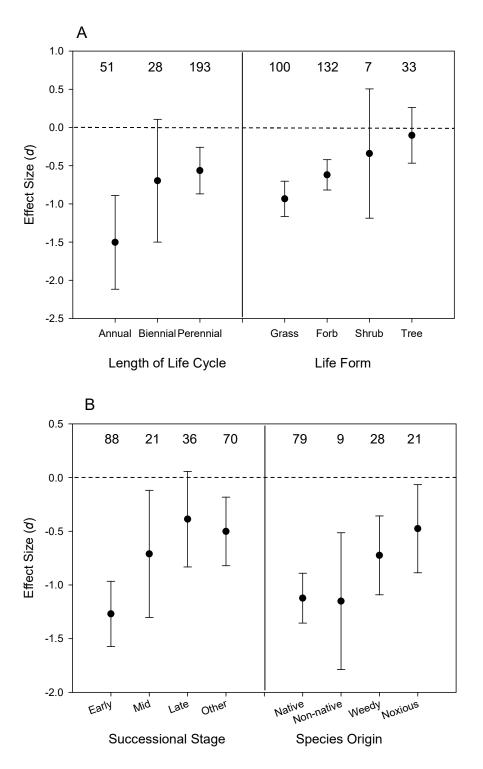


Figure 2. Effect sizes for experiments separated into (a) length of life cycle and life form classes, and (b) successional stage and species origin. Sample sizes are indicated at the top.

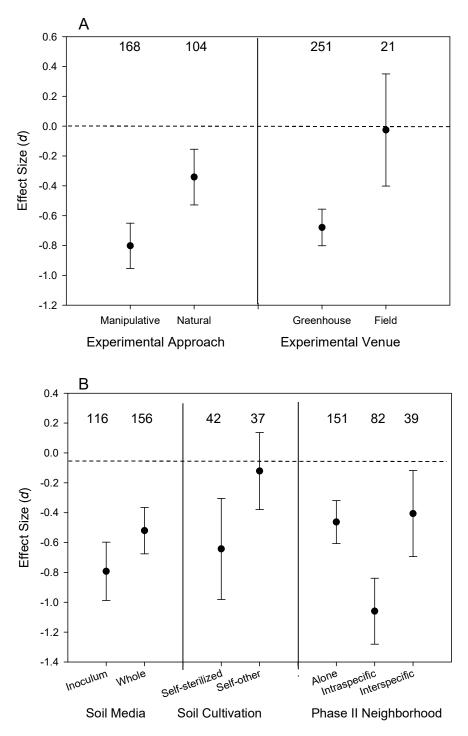


Figure 3. Effect sizes for experiments separated into (a) experimental approach, whether the soils in Phase I are cultivated through a manipulative or natural experiment, and experimental venue, and (b) soil media or volume used in Phase I, soil cultivation method, and target species neighborhood in Phase II. Sample sizes are indicated at the top.

Appendix A. List of references, species origin, the growth form, successional stage, experimental setting, habitat where species were collected, experimental approach, length of Phase I in months which also indicates whether the test was natural or manipulative, inoculum or whole species approach, cultivation in Phase I, length of Phase II, method of Phase II growth, which indicates whether there was competition, and the response variable measured for each of the 286 experiments.

Phase I:

Author	Target Species	Species origin	Growth form	Successional stage	Experimental setting	Habitat	Approach	Phase 1 (months)	Inoculum or Whole soil	Cultivated by Monoculutr e or Community	Phase II Growth	Response Variable
Agrawal et al.	Artemisia		Biennial									
2005	biennis	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Agrawal <i>et al</i> .	Artemisia		Biennial									
2005	campestris	Native	forb	Early	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Agrawal <i>et al</i> .	Bromus		Perennial									
2005	inermis	Non-native	grass	Unknown	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Agrawal <i>et al</i> .	Bromus		Perennial									
2005	kalmii	Native	grass	Unknown	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
	Campanula											
Agrawal <i>et al</i> .	rapunculoide		Perennial									
2005	S	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Agrawal et al.	Campanula		Perennial									
2005	rotundifolia	Native	forb	Late	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Agrawal et al.	Cerastium		Perennial									
2005	arvense	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Agrawal et al.	Cerastium		Biennial			~	~					
2005	fontanum	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Agrawal et al.	Elymus		Perennial			~	~					
2005	repens	Non-native	grass	Unknown	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Agrawal et al.	Elymus	37.7	Perennial	26.111	a 1		0.10.0.1		**** 1 '1	3.6		
2005	trachycaulus	Native	grass	Middle	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Agrawal et al.	Geum	NT .:	Perennial	X	0 1	6 1 1	0.10.0.1	1.0	XX71 1 '1	3.6	4.1	.1 1
2005	aleppicum	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Agrawal et al.	Geum	NI di	Perennial	TT 1	C 1	C 1 1	G 16 Od	1.0	3371 1 '1	M to	A 1	A1 1
2005	urbanum	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Agrawal <i>et al</i> . 2005	Lepidium	NI	Annual forb	E1	C1	C11	Self-Other	1.0	Whole soil	Monoculture	A 1	A 1
	campestre Lepidium	Non-native	Annual	Early	Greenhouse	Grassland	Sell-Other	1.0	whole soil	Monoculture	Alone	Aboveground
Agrawal <i>et al</i> . 2005	Lepiaium densiflorum	Native	forb	Early	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
	Plantago	Native	Annual	Early	Greennouse	Grassiand	Self-Other	1.0	whole son	Monoculture	Alone	Aboveground
Agrawal <i>et al</i> . 2005	rianiago major	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Agrawal <i>et al</i> .	major Plantago	Non-nauve	Annual	Larry	Greennouse	Grassianu	Self-Offici	1.0	Whole Soli	Monocunure	Alone	Aboveground
2005	rugellii	Native	forb	Early	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Agrawal <i>et al</i> .	Potentilla	Native	Perennial	Larry	Greenhouse	Grassianu	Scii-Other	1.0	Whole Soli	Monoculture	Alone	Aboveground
2005	arguta	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Agrawal <i>et al</i> .	Potentilla	rative	Perennial	Clikilowii	Greenhouse	Grassiand	Sen-Other	1.0	Whole soli	Wionoculture	Alone	Aboveground
2005	recta	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
												J
Agrawal <i>et al</i> .	Silene	Native	Annual	Early	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground

2005	antirrhina		forb									
Agrawal et al. 2005	Silene vulgaris	Non-native	Perennial forb	Unknown	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Beckstead and Parker 2003 Belnap <i>et al</i> .	Ammophila arenaria Hilaria	Non-native	Perennial grass Perennial	Early	Greenhouse	Dune grass	Self- Sterilized	Field	Whole soil	Monoculture	Intra- specific Intra-	Aboveground
2005 Belnap <i>et al</i> .	jamesii Hilaria	Native	grass Perennial	Unknown	Greenhouse	Desert	Self-Other	Field	Whole soil	Monoculture	specific Intra-	Aboveground
2005	jamesii Anthoxanthu	Native	grass Perennial	Unknown	Greenhouse	Desert	Self-Other	Field	Whole soil	Monoculture	Întra-	Aboveground
Bever 1994	m odoratum Anthoxanthu	Native	grass Perennial	Late	Greenhouse	Grassland	Self-Other	15.0	Inoculum	Monoculture	specific Intra-	Total biomass
Bever 1994	m odoratum Anthoxanthu	Native	grass Perennial	Late	Greenhouse	Grassland	Self-Other	15.0	Inoculum	Monoculture	specific Intra-	Total biomass
Bever 1994	m odoratum Anthoxanthu	Native	grass Perennial	Late	Greenhouse	Grassland	Self-Other Self-	15.0	Inoculum	Monoculture	specific Intra-	Total biomass
Bever 1994 Bever 1994	m odoratum Danthonia	Native Native	grass Perennial	Late Late	Greenhouse Greenhouse	Grassland Grassland	Sterilized Self-Other	15.0 15.0	Inoculum Inoculum	Monoculture Monoculture	Intra-	Total biomass Total biomass
Bever 1994 Bever 1994	spicata Danthonia spicata	Native	grass Perennial grass	Late	Greenhouse	Grassland	Self-Other	15.0	Inoculum	Monoculture	Intra- specific	Total biomass
Bever 1994	spicaia Danthonia spicata	Native	Perennial grass	Late	Greenhouse	Grassland	Self-Other	15.0	Inoculum	Monoculture	Intra- specific	Total biomass
Bever 1994	spicaia Danthonia spicata	Native	Perennial grass	Late	Greenhouse	Grassland	Self- Sterilized	15.0	Inoculum	Monoculture	Intra- specific	Total biomass
Bevel 1994	spicaia Panicum sphaerocarp	Native	Perennial	Late	Greenhouse	Grassianu	Sterrized	15.0	moculum	Monoculture	Intra-	Total biolilass
Bever 1994	on Panicum	Native	grass	Late	Greenhouse	Grassland	Self-Other	15.0	Inoculum	Monoculture		Total biomass
Bever 1994	sphaerocarp on Panicum	Native	Perennial grass	Late	Greenhouse	Grassland	Self-Other	15.0	Inoculum	Monoculture	Intra- specific	Total biomass
Bever 1994	sphaerocarp on	Native	Perennial grass	Late	Greenhouse	Grassland	Self-Other	15.0	Inoculum	Monoculture	Intra- specific	Total biomass
	Panicum sphaerocarp		Perennial				Self-				Intra-	
Bever 1994 Bezemer <i>et al</i> .	on Senecio	Native	grass Biennial	Late	Greenhouse	Grassland	Sterilized	15.0	Inoculum	Monoculture	specific	Total biomass
2006a Bezemer <i>et al</i> .	jacobaea Senecio	Native	forb Biennial	Early	Greenhouse	Grassland	Self-Other	72.0	Inoculum	Community	Alone Intra-	Total biomass
2006a Bezemer <i>et al</i> .	jacobaea Achillea	Native	forb Biennial	Early	Greenhouse	Grassland	Self-Other	72.0	Inoculum	Community	specific	Total biomass
2006b Bezemer <i>et al</i> .	millefolium Agrostis	Native	forb Perennial	Middle	Greenhouse	Grassland	Self-Other	24.0	Whole soil	Monoculture	Alone	Total biomass
2006b Bezemer <i>et al</i> .	capillaris Anthoxanthu	Native	grass Perennial	Middle	Greenhouse	Grassland	Self-Other	24.0	Whole soil	Monoculture	Alone	Total biomass
2006b Bezemer <i>et al</i> .	m odoratum	Native	grass Perennial	Late	Greenhouse	Grassland	Self-Other	24.0	Whole soil	Monoculture	Alone	Total biomass
2006b Bezemer <i>et al</i> .	Briza media Briza media	Native Native	grass Perennial	Unknown Unknown	Greenhouse Greenhouse	Grassland Grassland	Self-Other Self-Other	24.0 24.0	Whole soil Whole soil	Monoculture Monoculture	Alone Alone	Total biomass Total biomass
						_		-			_	

2006b			grass									
Bezemer et al.	Bromus		Perennial									
2006b	erectus	Native	grass	Unknown	Greenhouse	Grassland	Self-Other	24.0	Whole soil	Monoculture	Alone	Total biomass
Bezemer et al.	Festuca		Perennial									
2006b	ovina	Native	grass	Unknown	Greenhouse	Grassland	Self-Other	24.0	Whole soil	Monoculture	Alone	Total biomass
Bezemer et al.	Festuca		Perennial									
2006b	ovina	Native	grass	Unknown	Greenhouse	Grassland	Self-Other	24.0	Whole soil	Monoculture	Alone	Total biomass
Bezemer et al.	Hypochaeris	37	Biennial	3 61 111	a 1		0.10.0.1	240	**** 1 '1			m . 111
2006b	radicata	Native	forb	Middle	Greenhouse	Grassland	Self-Other	24.0	Whole soil	Monoculture	Alone	Total biomass
Bezemer et al.	Plantago	NI-4:	Biennial	M: 141.	C1	C1 1	C-16 O41	24.0	XX711 :1	M16	A 1	T-4-11:
2006b	lanceolata	Native	forb Biennial	Middle	Greenhouse	Grassland	Self-Other	24.0	Whole soil	Monoculture	Alone	Total biomass
Bezemer <i>et al</i> . 2006b	Plantago lanceolata	Native	forb	Middle	Greenhouse	Grassland	Self-Other	24.0	Whole soil	Monoculture	Alone	Total biomass
Bezemer <i>et al</i> .	Prunella	Native	Biennial	Middle	Greenhouse	Grassianu	Sch-Other	24.0	Whole soil	Monoculture	Alone	Total bibliass
2006b	vulgaris	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	24.0	Whole soil	Monoculture	Alone	Total biomass
Bezemer et al.	Sanguisorba	ranro	Biennial	Cimiowii	Greennouse	Grassiana	Sen Sinei	2 1.0	Whole Boll	Monocunare	riione	Total Olomass
2006b	minor	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	24.0	Whole soil	Monoculture	Alone	Total biomass
Bodelier et al.	Potamogeton		Perennial				Self-					
2006	pectinatus	Non-native	forb	Unknown	Greenhouse	Wetland	Sterilized	Field	Whole soil	Community	Alone	Total biomass
Bodelier et al.	Potamogeton		Perennial				Self-			•		
2006	pectinatus	Non-native	forb	Unknown	Greenhouse	Wetland	Sterilized	Field	Whole soil	Community	Alone	Total biomass
Bodelier et al.	Potamogeton		Perennial				Self-				Intra-	
2006	pectinatus	Non-native	forb	Unknown	Greenhouse	Wetland	Sterilized	Field	Whole soil	Community	specific	Total biomass
Bodelier et al.	Potamogeton		Perennial				Self-				Intra-	
2006	pectinatus	Non-native	forb	Unknown	Greenhouse	Wetland	Sterilized	Field	Whole soil	Community	specific	Total biomass
Bonanomi and												
Mazzoleni	Holcus	37	Perennial	** 1	a 1		0.10.0.1	2.5	**** 1 '1			m . 111
2005	lanatus	Native	grass	Unknown	Greenhouse	Grassland	Self-Other	3.5	Whole soil	Monoculture	Alone	Total biomass
Bonanomi and	11-1		D:-1								T., 4	
Mazzoleni 2005	Holcus	Native	Perennial	Unknown	Greenhouse	Grassland	Self-Other	2.5	Whole soil	Monoculture	Intra-	Total biomaga
Bonanomi and	lanatus	Native	grass	Ulikilowii	Greenhouse	Grassianu	Sen-Other	3.5	whole soil	Monoculture	specific	Total biomass
Mazzoleni	Holcus		Perennial								Inter-	
2005	lanatus	Native	grass	Unknown	Greenhouse	Grassland	Self-Other	3.5	Whole soil	Monoculture	specific	Total biomass
Bonanomi and	ianaius	rative	81433	Chkhown	Greennouse	Grassiana	Sen Other	3.3	Whole son	Wionoculture	specific	1 otar oromass
Mazzoleni	Holcus		Perennial									
2005	lanatus	Native	grass	Unknown	Greenhouse	Grassland	Self-Other	3.5	Whole soil	Monoculture	Alone	Total biomass
Bonanomi and			8									
Mazzoleni			Perennial									
2005	Inula viscosa	Native	shrub	Late	Greenhouse	Grassland	Self-Other	3.5	Whole soil	Monoculture	Alone	Total biomass
Bonanomi and												
Mazzoleni			Perennial								Intra-	
2005	Inula viscosa	Native	shrub	Late	Greenhouse	Grassland	Self-Other	3.5	Whole soil	Monoculture	specific	Total biomass
Bonanomi and												
Mazzoleni			Perennial								Inter-	
2005	Inula viscosa	Native	shrub	Late	Greenhouse	Grassland	Self-Other	3.5	Whole soil	Monoculture	specific	Total biomass
Bonanomi and			ъ : :									
Mazzoleni	Inaula arizara	Noti	Perennial	I at-	Cma am !	Cmag11	Calf O41	2 5	W/h o 1 :1	Mana1+	A 1 - · · -	Total his
2005	Inula viscosa	Native	shrub	Late	Greenhouse	Grassland	Self-Other	3.5	Whole soil	Monoculture	Alone	Total biomass
Bonanomi and	Pulicaria	Native	Perennial	Unknown	Greenhouse	Grassland	Self-Other	3.5	Whole soil	Monoculture	Alone	Total biomass

Mazzoleni 2005	dysenterica		forb									
Bonanomi and Mazzoleni 2005 Bonanomi and	Pulicaria dysenterica	Native	Perennial forb	Unknown	Greenhouse	Grassland	Self-Other	3.5	Whole soil	Monoculture	Inter- specific	Total biomass
Mazzoleni 2005	Pulicaria dysenterica Scirpus	Native	Perennial forb	Unknown	Greenhouse	Grassland	Self-Other	3.5	Whole soil	Monoculture	Alone	Total biomass
Bonanomi et	holoschoenu		Perennial									
al. 2005b	S	Native	grass	Late	Greenhouse	Grassland	Self-Other	Field	Whole soil	Monoculture	Alone	Total biomass
Callaway et al.	Centaurea	NT	Biennial	Б. 1	G 1	6 1 1	0.10.04	E: 11	T 1	G :	4.1	.1 1
2004a	maculosa	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone	Aboveground
Callaway <i>et al</i> . 2004b	Centaurea maculosa	Non notive	Biennial forb	Early	Greenhouse	Cuasaland	Self-Other	Field	In a autum	Community	Intra-	A la avecamous d
Callaway <i>et al.</i>	Centaurea	Non-native	Biennial	Early	Greenhouse	Grassland	Sen-Other	rieid	Inoculum	Community	specific Intra-	Aboveground
2004b	maculosa	Native	forb	Early	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	specific	Aboveground
Callaway <i>et al</i> .	Centaurea	Native	Biennial	Larry	Greenhouse	Grassiand	Scii-Other	riciu	moculum	Community	Intra-	Aboveground
2004b	maculosa	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	3.8	Inoculum	Monoculture	specific	Aboveground
Callaway <i>et al</i> .	Centaurea	Troil naure	Biennial	Lully	Greennouse	Grassiana	Sen Sinei	5.0	mocalam	Monocanare	Intra-	riooveground
2004b	maculosa	Native	forb	Early	Greenhouse	Grassland	Self-Other	3.8	Inoculum	Monoculture	specific	Aboveground
Callaway et al.	Centaurea		Biennial	,			Self-				Intra-	8
2004b	maculosa	Non-native	forb	Early	Greenhouse	Grassland	Sterilized	Field	Inoculum	Community	specific	Aboveground
Callaway et al.	Centaurea		Biennial	•			Self-			•	Intra-	· ·
2004b	maculosa	Native	forb	Early	Greenhouse	Grassland	Sterilized	Field	Inoculum	Community	specific	Aboveground
Callaway et al.	Centaurea		Biennial				Self-				Intra-	
2004b	maculosa	Non-native	forb	Early	Greenhouse	Grassland	Sterilized	3.8	Inoculum	Monoculture	specific	Aboveground
Callaway et al.	Centaurea		Biennial				Self-				Intra-	
2004b	maculosa	Native	forb	Early	Greenhouse	Grassland	Sterilized	3.8	Inoculum	Monoculture	specific	Aboveground
Casper and	Andropogon	37.7	Perennial	3 61 111	F: 11		10 1	Tr. 11	**** 1 '1			
Castelli 2007	gerardii	Native	grass	Middle	Field	Grassland	self-other	Field	Whole soil	Community	Alone	Aboveground
Casper and	Andropogon	NT 4	Perennial	N.C. 1.11	E: 11	0 1 1	10 4	F: 11	3371 1 '1	C :	Inter-	41 1
Castelli 2007	gerardii	Native	grass	Middle	Field	Grassland	self-other	Field	Whole soil	Community	specific	Aboveground
Casper and Castelli 2007	Schizachyriu	Native	Perennial	Late	Field	Grassland	self-other	Field	Whole soil	Community	Alone	Aboveground
Castelli 2007 Casper and	m scoparium Schizachyriu	Native	grass Perennial	Late	Field	Grassianu	Seif-offici	Piciu	WHOIC SOII	Community	Inter-	Aboveground
Caspel and Castelli 2007	m scoparium	Native	grass	Late	Field	Grassland	self-other	Field	Whole soil	Community	specific	Aboveground
Casper and	Sorghastrum	rative	Perennial	Lute	Tield	Grassiana	Self offici	1 icia	Whole son	Community	specific	Hooveground
Castelli 2007	nutans	Native	grass	Late	Field	Grassland	self-other	Field	Whole soil	Community	Alone	Aboveground
Casper and	Sorghastrum		Perennial								Inter-	
Castelli 2007	nutans	Native	grass	Late	Field	Grassland	self-other	Field	Whole soil	Community	specific	Aboveground
De Deyn et al.	Agrostis		Perennial				Self-			,	Inter-	
2004a	capillaris	Native	grass	Middle	Greenhouse	Grassland	Sterilized	Field	Whole soil	Community	specific	Aboveground
De Deyn et al.	Anthoxanthu		Perennial				Self-				Inter-	Aboveground
2004a	m odoratum	Native	grass	Late	Greenhouse	Grassland	Sterilized	Field	Whole soil	Community	specific	Audveground
De Deyn et al.	Campanula		Perennial				Self-				Inter-	Aboveground
2004a	rotundifolia	Native	forb	Late	Greenhouse	Grassland	Sterilized	Field	Whole soil	Community	specific	1100veground
De Deyn et al.	Centaurea	NT .	Perennial		a .		Self-	T	****		Inter-	Aboveground
2004a	jacea	Native	forb	Late	Greenhouse	Grassland	Sterilized	Field	Whole soil	Community	specific	
De Deyn et al.	Festuca	Native	Perennial	Late	Greenhouse	Grassland	Self-	Field	Whole soil	Community	Inter-	Aboveground

2004a	ovina		grass				Sterilized				specific	
De Deyn <i>et al</i> . 2004a	Festuca rubra	Native	Perennial grass	Middle	Greenhouse	Grassland	Self- Sterilized	Field	Whole soil	Community	Inter- specific	Aboveground
De Deyn et al.	Lolium		Perennial				Self-				Inter-	Aboveground
2004a De Deyn <i>et al</i> .	perenne Plantago	Native	grass Perennial	Early	Greenhouse	Grassland	Sterilized Self-	Field	Whole soil	Community	specific Inter-	Aboveground
2004a De Deyn <i>et al</i> .	lanceolata	Native	forb Perennial	Middle	Greenhouse	Grassland	Sterilized Self-	Field	Whole soil	Community	specific Inter-	
2004a De Deyn <i>et al</i> .	Poa trivialis Prunella	Native	grass Perennial	Early	Greenhouse	Grassland	Sterilized Self-	Field	Whole soil	Community	specific Inter-	Aboveground
2004a	vulgaris	Native	forb	Middle	Greenhouse	Grassland	Sterilized	Field	Whole soil	Community	specific	Aboveground
De Deyn <i>et al.</i> 2004a	Rumex obtusifolius	Native	Perennial forb	Early	Greenhouse	Grassland	Self- Sterilized	Field	Whole soil	Community	Inter- specific	Aboveground
De Deyn <i>et al.</i> 2004a	Stellaria media	Native	Annual forb	Early	Greenhouse	Grassland	Self- Sterilized	Field	Whole soil	Community	Inter- specific	Aboveground
De Deyn <i>et al</i> . 2004a	Succisa		Annual forb	· ·		Grassland	Self- Sterilized	Field	Whole soil	•	Inter- specific	Aboveground
Ehlers and	pratensis	Native		Early	Greenhouse	Grassiand	Sternized	ricia	whole son	Community	•	
Thompson 2004	Bromus erectus	Native	Perennial grass	Unknown	Field	Grassland	Self-Other	Field	Whole soil	Community	Intra- specific	Aboveground
Gillespie and	Erodium macrophyllu		Annual							•	•	
Allen 2006	m	Native	forb	Early	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone	Aboveground
Gillespie and	Erodium macrophyllu		Annual									
Allen 2006	m Erodium	Native	forb	Early	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone	Aboveground
Gillespie and	macrophyllu		Annual				Self-					
Allen 2006 Gustafson and	m Andropogon	Native	forb Perennial	Early	Greenhouse	Grassland	Sterilized	Field	Inoculum	Monoculture	Alone	Aboveground
Casper 2004	gerardii	Native	grass	Middle	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone	Total biomass
Gustafson and Casper 2004	Andropogon gerardii	Native	Perennial grass	Middle	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone	Total biomass
Gustafson and	Schizachyriu		Perennial							•		
Casper 2004 Gustafson and	m scoparium Schizachyriu	Native	grass Perennial	Late	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone	Total biomass
Casper 2004 Gustafson and	m scoparium Sorghastrum	Native	grass Perennial	Late	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone	Total biomass
Casper 2004 Gustafson and	nutans Sorghastrum	Native	grass Perennial	Late	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone	Total biomass
Casper 2004	nutans	Native	grass	Late	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone	Total biomass
Holah and Alexander	Andropogon		Perennial									
1999 Holah and	gerardii	Native	grass	Middle	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone	Height
Alexander	Andropogon		Perennial				Self-					
1999 Holah and	gerardii Chamaecrist	Native	grass	Middle	Greenhouse	Grassland	Sterilized	Field	Inoculum	Community	Alone	Height
Alexander 1999	a fasciculata Michx.	Native	Annual forb	Early	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone	Number of leaves

Holah and Alexander 1999	Chamaecrist a fasciculata Michx. Early	Native	Annual forb	Early	Greenhouse	Grassland	Self- Sterilized	Field	Inoculum	Community	Alone	Number of leaves
Kardol <i>et al</i> . 2006	successional community Early	Native	Commun ity	Early	Greenhouse	Grassland	Self-Other	5.0	Inoculum	Community	Inter- specific	Aboveground
Kardol <i>et al.</i> 2006	successional community Early	Native	Commun ity	Early	Greenhouse	Grassland	Self-Other	5.0	Inoculum	Community	Inter- specific	Aboveground
Kardol <i>et al</i> . 2006	successional community	Native	Commun ity	Early	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Inter- specific	Aboveground
Kardol <i>et al</i> . 2006	Early successional community	Native	Commun ity	Early	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Inter- specific	Aboveground
Kardol <i>et al</i> . 2006	Late successional community	Native	Commun ity	Late	Greenhouse	Grassland	Self-Other	5.0	Inoculum	Community	Inter- specific	Aboveground
Kardol <i>et al</i> . 2006	Late successional community	Native	Commun ity	Late	Greenhouse	Grassland	Self-Other	5.0	Inoculum	Community	Inter- specific	Aboveground
Kardol <i>et al</i> . 2006	Late successional community	Native	Commun ity	Late	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Inter- specific	Aboveground
Kardol <i>et al.</i> 2006	Late successional community	Native	Commun ity	Late	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Inter- specific	Aboveground
Kardol <i>et al</i> . 2006	Mid successional community	Native	Commun ity	Middle	Greenhouse	Grassland	Self-Other	5.0	Inoculum	Community	Inter- specific	Aboveground
Kardol <i>et al.</i> 2006	Mid successional community	Native	Commun ity	Middle	Greenhouse	Grassland	Self-Other	5.0	Inoculum	Community	Inter- specific	Aboveground
Kardol <i>et al</i> . 2006	Mid successional community	Native	Commun ity	Middle	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Inter- specific	Aboveground
Kardol <i>et al</i> . 2006	Mid successional community	Native	Commun ity	Middle	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Inter- specific	Aboveground
Kardol <i>et al.</i> 2007 Kardol <i>et al.</i>	Alopecurus geniculatus Alopecurus	Native	Perennial grass Perennial	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	Intra- specific Intra-	Total biomass
2007 Kardol <i>et al</i> .	geniculatus Alopecurus	Native	grass Perennial	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific Intra-	Total biomass
2007 Kardol <i>et al</i> .	geniculatus Alopecurus	Native	grass Perennial	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific Intra-	Total biomass
2007 Kardol <i>et al</i> .	geniculatus Alopecurus	Native	grass Perennial	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific Intra-	Total biomass
2007	geniculatus	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol et al.	Alopecurus	Native	Perennial	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	Intra-	Total biomass

2007	geniculatus		grass								specific	
Kardol et al.	Alopecurus		Perennial								Inter-	
2007	geniculatus	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Aboveground
Kardol et al.	Apera spica-		Annual	-							Intra-	Total biomass
2007	venti	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol et al.	Apera spica-		Annual								Intra-	
2007	venti	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol et al.	Apera spica-		Annual								Intra-	
2007	venti	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol et al.	Apera spica-		Annual								Intra-	
2007	venti	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol et al.	Apera spica-		Annual								Intra-	
2007	venti	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol et al.	Apera spica-		Annual								Intra-	
2007	venti	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol <i>et al</i> .	Apera spica-		Annual			~	~	• •			Inter-	
2007	venti	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Aboveground
** 11	Capsella											m - 111
Kardol et al.	bursa-		Annual				~	• •			Intra-	Total biomass
2007	pastoris	Native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	
77 1 1 . 7	Capsella											
Kardol et al.	bursa-	NT	Annual				0.10.0.1	2.0			Intra-	m - 111
2007	pastoris	Native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
77 1 1 . 7	Capsella		. 1								т.	
Kardol et al.	bursa-	NI 4	Annual	г 1	C 1	C 1 1	0.10.04	2.0	T 1	M to	Intra-	T 11:
2007	pastoris	Native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
V1 - 1 - 41	Capsella		A1								T., 4	
Kardol et al.	bursa-	NI-4:	Annual	EI	C1	C11	C-16 O41	2.0	T., 1	M 16	Intra-	T-4-11:
2007	pastoris	Native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol et al.	Capsella bursa-		A								Inter	
2007		Native	Annual forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	Intra-	Total biomass
2007	pastoris Capsella	Native	1010	Larry	Greenhouse	Grassianu	Self-Other	2.0	moculum	Monocunture	specific	Total biolilass
Kardol et al.	bursa-		Annual								Intra-	
2007	pastoris	Native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
2007	Capsella	rative	1010	Larry	Greenhouse	Grassiana	Sen-Omei	2.0	moculum	Wionoculture	specific	Total Ololliass
Kardol et al.	bursa-		Annual								Inter-	
2007	pastoris	Native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Aboveground
Kardol et al.	Conyza	Tuttive	Annual	Lurry	Greennouse	Grassiana	Sen Omer	2.0	moculam	Monoculture	Intra-	Č
2007	canadensis	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Aboveground
Kardol <i>et al</i> .	Conyza	Tion name	Annual	Lully	Greenmouse	Grassiana	Sen omer	2.0	moculani	Monocanare	Intra-	
2007	canadensis	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol <i>et al</i> .	Conyza	11011 1101111	Annual	2	or commons.	Grassiana	Sen Sinei	2.0	1110 0 4114111	1,10110 0 011010	Intra-	10441 010114400
2007	canadensis	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol et al.	Conyza		Annual								Intra-	
2007	canadensis	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol et al.	Conyza		Annual	,				-			Intra-	
2007	canadensis	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol et al.	Conyza		Annual	,							Intra-	
2007	canadensis	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
				-							•	

Kardol et al.	Conyza		Annual								Inter-	
2007	canadensis	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture		Aboveground
Kardol <i>et al</i> .	canaaensis	14011-Hative	Annual	Larry	Greenhouse	Grassianu	Sen-Other	2.0	moculum	Monoculture	Intra-	Aboveground
2007	Poa annua	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol <i>et al</i> .	1 ou unnuu	Native	Annual	Larry	Greenhouse	Grassianu	Scii-Other	2.0	moculum	Monoculture	Intra-	
2007	Poa annua	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol <i>et al</i> .	1 ou unnuu	Native	Annual	Larry	Greenhouse	Grassianu	Scii-Other	2.0	moculum	Monoculture	Intra-	Total Ololliass
2007	Poa annua	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol <i>et al</i> .	1 ou unnuu	rative	Annual	Larry	Greenhouse	Grassianu	Self-Other	2.0	moculum	Monoculture	Intra-	Total bibliass
2007	Poa annua	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol <i>et al</i> .	1 ou unnuu	runve	Annual	Lurry	Greenhouse	Grassiana	Sen Onici	2.0	moculain	Monocunare	Intra-	Total ololliass
2007	Poa annua	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture		Total biomass
Kardol <i>et al</i> .	1 ou unnuu	1144170	Annual	Lully	Greenmouse	Grassiana	Sen Giner	2.0	mocuram	Monocunare	Intra-	Total Olollass
2007	Poa annua	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture		Total biomass
Kardol et al.	1 00 0	1100110	Annual	Luiij	Greenine and	Grabbiana	2011 011101	2.0	1110 0 01101111	11101100011010	Inter-	10141 01011400
2007	Poa annua	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Aboveground
Kardol et al.	Viola	1100110	Annual	Luiij	Greenine and	Grabbiana	2011 011101	2.0	1110 0 01101111	11101100011010	Intra-	C
2007	arvensis	Native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol et al.	Viola		Annual	,							Intra-	
2007	arvensis	Native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture		Total biomass
Kardol et al.	Viola		Annual	,							Intra-	
2007	arvensis	Native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture		Total biomass
Kardol et al.	Viola		Annual	,							Intra-	
2007	arvensis	Native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol et al.	Viola		Annual	·							Întra-	
2007	arvensis	Native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol et al.	Viola		Annual	•							Întra-	
2007	arvensis	Native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol et al.	Viola		Annual	-							Inter-	
2007	arvensis	Native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Aboveground
Klironomos	Achillea		Perennial									
2002	millefolium	Native	forb	Middle	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Agrostis		Perennial									
2002	gigantea	Non-native	grass	Middle	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Agrostis		Perennial									
2002	scabra	Native	grass	Middle	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Аросупит		Perennial									
2002	cannabinum	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Asclepias		Perennial									
2002	syriaca	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Asparagus		Perennial									
2002	officinalis	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Aster novae-		Perennial		~ .	~	~					
2002	angliae	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Aster	NT	Perennial	** 1	G 1	a	0.10.0.1	. 0	**** 1 '1	3.6		m . 111
2002	simplex	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Aster	NT ·	Perennial	TT 1	0 1	0 1 1	0.10.04		3371 1 '1	M 1:	4.1	T 4 11 1
2002	vimineus	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Bromus	NI (Perennial	TT 1	0 1	0 1 1	C 15 Od	5.0	3371 1 '1	M 16	4.1	T 11.
2002	inermis	Non-native	grass	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass

Klironomos			Perennial									
2002	Carex aurea	Native	grass	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	curen uureu	1144110	Perennial	Cindio wii	Greenmouse	Grassiana	ben omer	5.0	Whole son	Monoculture	7 Hone	Total ololliass
2002	Carex flava	Native	grass	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Carex		Perennial									
2002	garberi	Native	grass	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Carex		Perennial									
2002	granularis	Native	grass	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Centaurea		Perennial									
2002	jacea	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Cerastium		Biennial									
2002	vulgatum	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
171.	Chenopodiu		D: :1									
Klironomos 2002	m ambrosioides	Non-native	Biennial forb	Early	Greenhouse	Cuasaland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
2002	Chrysanthem	Non-nauve	1010	Early	Greenhouse	Grassland	Sen-Other	3.0	Whole son	Monoculture	Alone	Total biolilass
	um											
Klironomos	leucanthemu		Perennial									
2002	m	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Cichorium		Biennial									
2002	intybus	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Circium		Perennial	-								
2002	arvense	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Circium		Biennial									
2002	vulgare	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Convolvulus	3.T	Perennial	** 1	G 1	6 1 1	0.10.04	5.0	3371 1 11	3.6	4.1	m . 111
2002	arvensis	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos 2002	Coronilla varia	Non-native	Perennial forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	varia Dactylis	Non-nauve	Perennial	Ulikilowii	Greenhouse	Grassiand	Sen-Other	3.0	Whole soil	Monoculture	Alone	Total biolilass
2002	glomerata	Non-native	grass	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Daucus	Tion harve	Biennial	Chinown	Greennouse	Grassiana	Sen Other	5.0	Whole son	Wionoculture	THORE	Total ololliass
2002	carota	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Echium		Biennial	3								
2002	vulgare	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
	Erigeron											
Klironomos	philadelphic		Biennial									
2002	us	Native	forb	Early	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Erigeron	N	Biennial		G 1		0.10.0.1	- 0	**** 1 '1	3.6		m . 111
2002	strigosus	Native	forb	Early	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos 2002	Fragaria	NI-4:	Perennial	T.T., 1	C1	C1	C-16 O41	5.0	XX711 :1	M 1	A 1	T-4-1 h :
Klironomos	virginiana Galium	Native	forb Perennial	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
2002	mollugo	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Galium	ron native	Perennial	Chichown	Greennouse	Grassiana	Sen Omei	5.0	Whole son	Wonoculture	THORE	Total ololliass
2002	palustre	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Geum		Perennial			_	_				_	
2002	aleppicum	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Hieracium		Perennial									
2002	aurantiacum	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass

V1:	II:		D:-1									
Klironomos 2002	Hieracium pilosella	Non-native	Perennial forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	A 1 am a	Total biomass
Klironomos	1	Non-nauve	Perennial	Ulikilowii	Greenhouse	Grassianu	Self-Other	3.0	Whole Soli	Monoculture	Alone	Total biolilass
	Hieracium	Non motive		I Independent	Casaahayaa	Cussaland	Calf Othan	5.0	W/hologoil	Mamaaultuma	A 1 am a	Total biomass
2002	pratense	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Hypericum	NI C	Perennial	TT 1	C 1	0 1 1	C 10 Od	5.0	3371 1 '1	M 1	A 1	T 4 11 1
2002	perforatum	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Juncus	3.T:	Perennial	TT 1	0 1	6 1 1	0.10.04	5 0	3371 1 11	3.6 1.	. 1	T . 11:
2002	dudleyi	Native	grass	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Linaria		Perennial		~ .	~	~					
2002	vulgaris	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Medicago		Perennial									
2002	lupulina	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Oenothera		Biennial									
2002	biennis	Native	forb	Early	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Oenothera		Perennial									
2002	perennis	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Panicum		Perennial									
2002	lanuginosum	Native	grass	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Phleum		Perennial									
2002	pratense	Non-native	grass	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Plantago		Perennial									
2002	lanceolata	Non-native	forb	Middle	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Poa		Perennial									
2002	compressa	Non-native	grass	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Poa		Perennial									
2002	pratensis	Non-native	grass	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Potentilla		Perennial									
2002	recta	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Prunella		Perennial									
2002	vulgaris	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Ranunculus		Perennial									
2002	acris	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Rudbeckia		Biennial									
2002	serotina	Native	forb	Early	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Satureja		Perennial	,								
2002	vulgaris	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Silene		Perennial									
2002	cucubalus	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Solidago		Perennial									
2002	canadensis	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Solidago		Perennial									
2002	graminifolia	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Solidago	1,001,0	Perennial	ommo mi		Grabbiana	2011 011101	2.0		111011000110110	1110110	10441 010111400
2002	nemoralis	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Solidago	1141110	Perennial	O III III WII	Greennouse	Grassiana	Sen Giner	3.0	Whole Boll	Wichocaltare	ritone	Total ololliass
2002	rugosa	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Taraxacum	1141110	Perennial	CIMIOWII	Greenhouse	Grassiana	Sen Suiei	5.0		Monoculture	1 11011C	Total Glorings
2002	officinale	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Tragopogon	1 toll liative	Biennial	Shkhowh	Siconnouse	Siassiana	Sen Onici	5.0	Whole Boll	monocunate	1110110	1 otal olollidəs
2002	pratensis	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
2002	praicisis	1 TOIL HALLYC	1010	Lully	Greenhouse	Grassiana	Jen Julei	5.0	** 11010 3011	Monoculture	2 110110	10141 010111438

Klironomos	Trifolium		Biennial									
2002	pratense	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Veronica		Perennial	•								
2002	officinalis	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos			Perennial									
2002	Vicia cracca	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Knevel et al.	Amnophila		Perennial				Self-					
2004	arenaria	Native	grass	Early	Greenhouse	Dune grass	Sterilized	Field	Inoculum	Monoculture	Alone	Total biomass
Kulmatiski et	Exotic		communi			Shrub					Comm	
al. 2006	species mix	Non-native	ty	Middle	Field	steppe	Self-Other	Field	Whole soil	Community	unity	Plant cover
Kulmatiski et	Native	NT	communi		F: 11	Shrub	0.10.0.1	F: 11	**** 1 '1	a .	Comm	701
al. 2006	species mix	Native	ty	Late	Field	steppe	Self-Other	Field	Whole soil	Community	unity	Plant cover
Kulmatiski,	Balsamorrhi	NT	Perennial	¥ .	T: 11		0.10.0.1	T: 11	**** 1 '1	a	Comm	
unpubl. Data	zae sagittata	Native	forb	Late	Field	Grassland	Self-Other	Field	Whole soil	Community	unity	Aboveground
Kulmatiski,	Bromus	NT	Annual	г 1	F: 11	6 1 1	G 16 Od	F: 11	3371 1 '1	C :	Comm	A.1 1
unpubl. Data	tectorum	Non-native	grass	Early	Field	Grassland	Self-Other	Field	Whole soil	Community	unity	Aboveground
Kulmatiski,	Inimma amm	Native	Perennial forb	Middle	Field	Grassland	Self-Other	Field	Whole soil	Community	Comm	A la overamana d
unpubl. Data Kulmatiski,	Lupinus spp.	Native	Perennial	Middle	rieid	Grassianu	Sen-Other	rieid	whole son	Community	unity Comm	Aboveground
unpubl. Data	Poa bulbosa	Non-native	grass	Unknown	Field	Grassland	Self-Other	Field	Whole soil	Community	unity	Aboveground
Kulmatiski,	Pseudoroegn	Non-native	Perennial	Clikilowii	riciu	Grassianu	Scii-Other	riciu	WHOIC SOII	Community	Comm	Aboveground
unpubl. Data	eria spicata	Native	grass	Late	Field	Grassland	Self-Other	Field	Whole soil	Community	unity	Aboveground
Kulmatiski,	Sissymbrium	Ivative	Biennial	Late	ricid	Grassianu	Sch-Other	riciu	WHOIC SOII	Community	Comm	Aboveground
unpubl. Data	loeselii	Non-native	forb	Early	Field	Grassland	Self-Other	Field	Whole soil	Community	unity	Aboveground
Meiman <i>et al</i> .	Centaurea	Tion name	Biennial	Lurry	Tield	Grassiana	Sen Sinei	1 icia	Whole Boll	Community	unity	ricoveground
2006	maculosa	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	Field	Whole soil	Community	Alone	Total biomass
Morris et al.	Acroptilon		Perennial									
2006	repens	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	Field	Whole soil	Monoculture	Alone	Total biomass
	Ageratina		Perennial								Intra-	
Niu et al 2007	adenophora	Non-native	shrub	Unknown	Greenhouse	Forest	Self-Other	Field	Inoculum	Community	specific	Total biomass
	Ageratina		Perennial				Self-			·	Întra-	
Niu et al 2007	adenophora	Non-native	shrub	Unknown	Greenhouse	Forest	Sterilized	Field	Inoculum	Community	specific	Total biomass
	Eupatorium		Perennial								Intra-	
Niu et al 2007	fortunei	Native	forb	Unknown	Greenhouse	Forest	Self-Other	Field	Inoculum	Community	specific	Total biomass
	Eupatorium		Perennial				Self-				Intra-	
Niu et al 2007	fortunei	Native	forb	Unknown	Greenhouse	Forest	Sterilized	Field	Inoculum	Community	specific	Total biomass
	Loilium		Perennial				Self-				Intra-	
Niu et al 2007	perenne	Native	grass	Early	Greenhouse	Forest	Sterilized	Field	Inoculum	Community	specific	Total biomass
12005	Lollium	NT	Perennial	** 1			0.10.0.1	T: 11		a	Intra-	m . 111
Niu et al 2007	perenne	Native	grass	Unknown	Greenhouse	Forest	Self-Other	Field	Inoculum	Community	specific	Total biomass
N: 4 12007	Medicago	NT	Perennial	TT 1	C 1	Г	G 16 Od	F: 11	T 1	C :	Intra-	T. (11.
Niu et al 2007	sativa	Non-native	forb	Unknown	Greenhouse	Forest	Self-Other	Field	Inoculum	Community	specific	Total biomass
N:4 -1 2007	Medicago	NI	Perennial forb	T.T., 1	C	E	Self- Sterilized	Field	T., 1	C	Intra-	T-4-11:
Niu et al 2007 Packer and	sativa Prunus	Non-native	Perennial	Unknown	Greenhouse	Forest	Sternized Self-	rieid	Inoculum	Community	specific	Total biomass
Clay 2009	rrunus serotina	Native	tree	Unknown	Greenhouse	Forest	Sterilized	Field	Inoculum	Community	Alone	Aboveground
Packer and	Prunus	INALIVE	Perennial	Olikilowii	Greenhouse	POTEST	Sternized Self-	Piciu	mocumin	Community	Alone	Aboveground
Clay 2000	serotina	Native	tree	Unknown	Greenhouse	Forest	Sterilized	1.3	Inoculum	Community	Alone	Aboveground
Packer and	Prunus	1 1411 10	Perennial	CHRIIOWII	Greenhouse	1 01031	Self-	1.5	moculum	Community	1 110HC	1100 veground
Clay 2000	serotina	Native	tree	Unknown	Greenhouse	Forest	Sterilized	2.5	Inoculum	Community	Alone	Aboveground
July 2000	Serounu	1 1441 10		CIMIOWII	Greenhouse	1 01000	Sterrized	2.3	moculani	Community	2 110110	. 100 reground

Packer and	Prunus	N-4:	Perennial	I I 1	C1	E	Self- Sterilized	2.0	I	Cit	A 1	A1 1
Clay 2000	serotina Bouteloua	Native	tree Annual	Unknown	Greenhouse	Forest	Sternized	3.8	Inoculum	Community	Alone	Aboveground
Peltzer 2001	gracilis Bouteloua	Native	grass Annual	Early	Field	Grassland	Self-Other	Field	Whole soil	Community	Alone Inter-	Growth
Peltzer 2001 Puerta-Pinero	gracilis	Native	grass Perennial	Early	Field	Grassland	Self-Other	Field	Whole soil	Community	specific	Growth
et al. 2006 Puerta-Pinero	Quercus ilex	Native	tree Perennial	Unknown	Greenhouse	Forest	Self-Other	Field	Whole soil	Monoculture	Alone	Total biomass
et al. 2006 Puerta-Pinero	Quercus ilex	Native	tree Perennial	Unknown	Greenhouse	Forest	Self-Other	Field	Whole soil	Monoculture	Alone	Total biomass
et al. 2006 Puerta-Pinero	Quercus ilex	Native	tree Perennial	Unknown	Greenhouse	Forest	Self-Other	Field	Whole soil	Monoculture	Alone	Total biomass
et al. 2006	Quercus ilex	Native	tree Perennial	Unknown	Greenhouse	Forest	Self-Other	Field	Whole soil	Monoculture	Alone	Total biomass
Puerta-Pinero et al. 2006	Quercus ilex	Native	tree	Unknown	Greenhouse	Forest	Self-Other	Field	Whole soil	Monoculture	Alone	Total biomass
Puerta-Pinero et al. 2006	Quercus ilex	Native	Perennial tree	Unknown	Greenhouse	Forest	Self-Other	Field	Whole soil	Monoculture	Alone	Total biomass
Puerta-Pinero et al. 2006	Quercus ilex	Native	Perennial tree	Late	Greenhouse	Forest	Self- Sterilized	Field	Whole soil	Monoculture	Alone	Total biomass
Reinhart and Callaway 2004	Acer negundo	Non-native	Perennial tree	Unknown	Greenhouse	Forest	Self-Other	Field	Inoculum	Community	Alone	Total biomass
Reinhart and Callaway 2004	Acer negundo	Native	Perennial tree	Unknown	Greenhouse	Forest	Self-Other	Field	Inoculum	Community	Alone	Total biomass
Reinhart and	Acer	N T 4:	Perennial	TT 1	G 1	Г.,	Self-	E: 11	T 1	. ·	A 1	T + 11.
Callaway 2004 Reinhart and	negundo Acer	Non-native	tree Perennial	Unknown	Greenhouse	Forest	Sterilized Self-	Field	Inoculum	Community	Alone	Total biomass
Callaway 2004 Reinhart and	negundo Acer	Native	tree Perennial	Unknown	Greenhouse	Forest	Sterilized	Field	Inoculum	Community	Alone	Total biomass
Callaway 2004 Reinhart and	platanoides Acer	Non-native	tree Perennial	Unknown	Greenhouse	Forest	Self-Other	Field	Inoculum	Community	Alone	Total biomass
Callaway 2004 Reinhart and	platanoides Acer	Non-native	tree Perennial	Unknown	Greenhouse	Forest	Self-Other	Field	Inoculum	Community	Alone	Total biomass
Callaway 2004 Reinhart and	platanoides Acer	Native	tree Perennial	Unknown	Greenhouse	Forest	Self-Other Self-	Field	Inoculum	Community	Alone	Total biomass
Callaway 2004 Reinhart and	platanoides Acer	Non-native	tree Perennial	Unknown	Greenhouse	Forest	Sterilized Self-	Field	Inoculum	Community	Alone	Total biomass
Callaway 2004 Reinhart and	platanoides Acer	Non-native	tree Perennial	Unknown	Greenhouse	Forest	Sterilized Self-	Field	Inoculum	Community	Alone	Total biomass
Callaway 2004 Reinhart <i>et al</i> .	platanoides Prunus	Native	tree Perennial	Unknown	Greenhouse	Forest	Sterilized	Field	Inoculum	Community	Alone	Total biomass
2003	serotina	Native	tree	Middle	Greenhouse	Forest	Self-Other	Field	Inoculum	Community	Alone	Aboveground
Reinhart et al. 2003	Prunus serotina	Native	Perennial tree	Middle	Greenhouse	Forest	Self-Other	Field	Inoculum	Community	Intra- specific	Aboveground
Reinhart <i>et al</i> . 2003	Prunus serotina	Non-native	Perennial tree	Unknown	Greenhouse	Forest	Self-Other	Field	Inoculum	Community	Alone	Aboveground
Reinhart et al. 2003	Prunus serotina	Non-native	Perennial tree	Unknown	Greenhouse	Forest	Self-Other	Field	Inoculum	Community	Intra- specific	Aboveground
Reinhart et al.	Prunus		Perennial				Self-			,		C
2003	serotina	Non-native	tree	Unknown	Greenhouse	Forest	Sterilized	Field	Inoculum	Community	Alone	Aboveground

Perminal contact Primus Perminal contact Primus Perminal contact Primus	Reinhart et al.	Prunus		Perennial			_	Self-				Intra-	
Reinhart et al. Prumus Preminial tree Ulnknown Greenhouse Forest Sterilized Field Incoulum Community Specific Seedling Seedlin	2003 Reinhart <i>et al</i> .	serotina Prunus	Non-native	tree Perennial	Unknown	Greenhouse	Forest	Sterilized Self-	Field	Inoculum	Community	specific	Aboveground
Primis P		serotina	Native		Unknown	Greenhouse	Forest		Field	Inoculum	Community		Aboveground
Reinhart et al. Prunus Perennial Prunus Secoling Secol				Perennial									
Perminate al. Prunus Preminate al. Prunus Prunus Preminate al.			Native		Unknown	Greenhouse	Forest	Sterilized	Field	Inoculum	Community		
Reinhart et al. Prunus Perennial Intra- Seeffiguilland Servitina Seeffiguilland Servitina Seeffiguilland													
Reinhart et al. Acer Perennial Field			Native		Middle	Greenhouse	Forest		Field	Inoculum	Community	1	()
Reinhart et al. Acer Perennial Populus Perennial Perenni							_						
Populus Populus Perennia Populus Perennia Perennia Populus Perennia Populus Perennia Populus Perennia Populus Perennia Populus Perennia Perenn			Native		Unknown	Greenhouse	Forest	Sterilized	Field	Inoculum	Community		survival (%)
Reinhart et al. 2005b trihocarpa Native tree Late Field Forest Self-Other Field Whole soil Community specific growth Inter-Relative growth Growth Inter-Relative growth Inter-Relative growth Growth Inter-Relative growth Growth Greenhouse growth Growth Greenhouse growth Growth Greenhouse growth Growth Greenhouse growth Greenhouse growth Greenhouse Gree							_	~					
Suding et al. Acomastylis Perennial Perennial Suding et al. Deschampsia Perennial Suding et al. Deschampsia Perennial Perennial Perennial Perennial Suding et al. Deschampsia Perennial		1	Non-native		Middle	Field	Forest	Self-Other	Field	Whole soil	Community		Aboveground
Suding et al. Acomastylis Native Forb Cate Field Alpine Self-Other Field Whole soil Community Specific growth		1			_		_	~					
Perennial Pere		1	Native		Late	Field	Forest	Self-Other	Field	Whole soil	Community		U
Suding et al. Acomastylis vossii Native for Late Field Alpine Self-Other Field Whole soil Community specific abundance caspitosa Native grass Late Field Alpine Self-Other Field Whole soil Community specific growth Inter-Relative 2004 caespitosa Native grass Late Field Alpine Self-Other Field Whole soil Community specific growth Inter-Relative 2004 caespitosa Native grass Late Field Alpine Self-Other Field Whole soil Community specific growth Inter-Relative 2004 caespitosa Native grass Late Field Alpine Self-Other Field Whole soil Community specific abundance Suguenza et al. Artemisia Perennial Self- Self-Other Self- Self-Other Self- Self- Self-Other Self- Se		-			_			~					
Suding et al. Deschampsia Native French Late Field Alpine Self-Other Field Whole soil Community Specific S			Native		Late	Field	Alpıne	Self-Other	Field	Whole soil	Community	1	
Suding et al. Deschampsia (acespitosa) Native grass (acespitosa) Perennial (acespitosa) (acespit			NT		T .	T: 11	.1 .	0.10.04	F: 11	XX 71 1 '1	G :		
Suding et al. Deschampsia Perennial Perennial Suding et al. Deschampsia Perennial Deschampsia Perennial Suding et al. Deschampsia Perennial Deschampsia Perennial Suding et al. Deschampsia Perennial Deschampsia Descha			Native		Late	Field	Alpine	Self-Other	Field	Whole soil	Community		
Suding et al. Deschampsia caespitosa Native grass Late Field Alpine Self-Other Self-Other Self-Other Self-Other Self-Other Self-Suguenza et al. Artemisia Perennial Perennial Suguenza et al. Artemisia Perennial Perennial Self-Other Self-Self-Self-Self-Self-Self-Self-Self-			NT		T .	T: 11	.1 .	0.10.04	F: 11	XX71 1 '1	G :		
2004 casspitosa Native grass Late Field Alpine Self-Other Self- 2006 californicus Native Breennial Creenhouse Steppe Sterilized Field Inoculum Community Alone Total biomass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Sterilized Field Whole soil Community Alone Total biomass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Sterilized Field Whole soil Community Alone Total biomass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Sterilized Field Whole soil Community Alone Total biomass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Sterilized Field Whole soil Community Alone Total biomass Self- 2001 arenaria Native grass Unknown Greenhouse Grassland Sterilized Field Whole soil Community Alone Total biomass Self- 2001 arenaria Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- 2007 biflorus Non-native grass Early Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Van der Putten Eragrostis Perennial Ferennial Field Fie		1	Native	0	Late	Field	Alpine	Self-Other	Field	Whole soil	Community		
Suguenza et al. Artemisia Perennial Shrub Self- 2006 californicus Native shrub Late Greenhouse steppe Sterilized Field Inoculum Community Alone Total biomass Troelstra et al. Ammophila Perennial 2001 arenaria Native grass Unknown Greenhouse Dune grass Sterilized Field Whole soil Community Alone Total biomass Troelstra et al. Ammophila Perennial 2001 arenaria Native grass Unknown Greenhouse Dune grass Sterilized Field Whole soil Community Alone Total biomass Troelstra et al. Carex Perennial 2001 arenaria Native grass Unknown Greenhouse Dune grass Sterilized Field Whole soil Community Alone Total biomass Troelstra et al. Carex Perennial 2001 arenaria Native grass Unknown Greenhouse Dune grass Sterilized Field Whole soil Community Alone Total biomass Troelstra et al. Carex Perennial 2001 arenaria Native grass Unknown Greenhouse Dune grass Sterilized Field Whole soil Community Alone Total biomass Troelstra et al. Carex Perennial 2001 arenaria Native grass Unknown Greenhouse Dune grass Sterilized Field Whole soil Community Alone Total biomass Troelstra et al. 2007 meridionalis Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Van der Putten Cenchrus Non-native grass Early Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Van der Putten Eragrostis Perennial Rative Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Van der Putten Eragrostis Perennial Rative Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- et al. 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- et al. 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture Specific Aboveground Intra- Eragrostis Field Inoculum Monoculture Specific Aboveground Intra- Relative total		1	NT		T .	T: 11	.1 .	0.10.04	F: 11	XX71 1 '1	G :		
2006 Californicus Native Shrub Perennial P		1	Native		Late	Field			Field	Whole soil	Community	specific	abundance
Troelstra et al. Ammophila arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- et al. 2007 meridionalis Native grass Early Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- et al. 2007 biflorus Non-native grass Early Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- et al. 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- et al. 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- et al. 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- et al. 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- et al. 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- et al. 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- et al. 2007 lehmanniana Native Grassland Sterilized Field Inoculum Monoculture Specific Aboveground Intra- et al. 2007 lehmanniana Native Grassland Sterilized Field Inoculum Mo			NT 4		т.,	C 1			F: 11	T 1	C :	A 1	T 4 11 1
Dune grass Dune grass Sterilized Field Whole soil Community Alone Total biomass Self- Self		J	Native		Late	Greennouse	steppe		Field	Inoculum	Community	Alone	Total biomass
Troelstra et al. Ammophila Native grass Unknown Greenhouse Dune grass Sterilized Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Sterilized Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Sterilized Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Sterilized Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Sterilized Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Sterilized Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Sterilized Self- 2001 arenaria Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture Specific Aboveground Intraeratal. 2007 biflorus Non-native grass Early Greenhouse Grassland Sterilized Self- Van der Putten Eragrostis Perennial Freenhouse Grassland Sterilized Self- Van der Stoel Ammophila Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture Specific Aboveground Intraeratal. 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture Specific Aboveground Intraeratal. 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture Specific Aboveground Intraeratal. 2007 lehmanniana Native Grassland Sterilized Field Inoculum Monoculture Specific Aboveground Intraeratal. 2007 lehmanniana Native Grassland Sterilized Field Inoculum Monoculture Specific Aboveground Intraeratal. 2007 lehmanniana Native Grassland Sterilized Field Inoculum Monoculture Specific Aboveground Intraeratal. 2007 lehmanniana Native Grassland Sterilized Field Inoculum Monoculture Specific Aboveground Intraeratal. 2007 lehmanniana Native Grassland Sterilized Field Inoculum Monoculture Specific Aboveground Intraeratal. 2007 lehmanniana Native Grassland Sterilized Field Inoculum Monoculture Specific Aboveground Intraeratal. 2007 lehmanniana Native Grassland Sterilized Field Inoculum Monoculture Specific Aboveground Intraeratal. 2007 lehmanniana Native Grassland Sterilized Field Inoculum Monoculture Specific Aboveground Intrae			NI-4:		I I1	C1	D		TC-14	XX/11:1	C	A 1	T-4-11::
2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Sterilized Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Sterilized Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Sterilized Field Whole soil Community Alone Total biomass Self- 2007 meridionalis Native grass Late Greenhouse Grassland Self- 2008 Van der Putten Cenchrus Van der Putten Eragrostis Perennial Freenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- 2009 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Native Self- 2008 Self- 2009 Native Self- 200			Native		Unknown	Greennouse	Dune grass		rieid	whole soil	Community	Aione	Total biomass
Troelstra et al. Carex Perennial 2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Sterilized Self- 2001 arenaria Native grass Unknown Greenhouse Dune grass Sterilized Field Whole soil Community Alone Total biomass Self- 2007 meridionalis Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Self- 2007 biflorus Non-native grass Early Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Self- 2007 biflorus Non-native grass Early Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Self- 2007 biflorus Non-native grass Early Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Intra- 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Native Self- 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture Specific Aboveground Native Self- 2008 lehmanniana Native Grassland Sterilized Field Inoculum Monoculture Specific Aboveground Native Self- 2009 lehmanniana Native Grassland Sterilized Field Inoculum Monoculture Specific Aboveground Native Self- 2009 lehmanniana Native Grassland Sterilized Field Inoculum Monoculture Self- 2009 lehmanniana Native Grassland Self- 2009 l			Matiria		I Indra ovem	Casaahayaa	Duma amaga		Eigld	Whalasail	Community	A 1 am a	Total hiamass
2001arenariaNativegrassUnknownGreenhouseDune grassSterilized Self-FieldWhole soilCommunityAloneTotal biomass2001arenariaNativegrassUnknownGreenhouseDune grassSterilized Self-FieldWhole soilCommunityAloneTotal biomassVan der PuttenAristidaPerennialFieldWhole soilCommunityAloneTotal biomassVan der PuttenCenchrusNativegrassLateGreenhouseGrasslandSterilized Self-FieldInoculumMonoculturespecificAbovegroundVan der PuttenEragrostisNon-nativegrassEarlyGreenhouseGrasslandSterilized Self-FieldInoculumMonoculturespecificAbovegroundVan der PuttenEragrostisPerennialFieldInoculumMonoculturespecificAbovegroundVan der StoelAmmophilaNativegrassLateGreenhouseGrasslandSterilized Self-FieldInoculumMonoculturespecificAboveground			Native		Ulikilowii	Greenhouse	Dulle grass		Field	WHOIE SOII	Community	Alone	Total bibliass
Troelstra et al. Carex Perennial Van der Putten Van der Putten Van der Putten Cenchrus Van der Putten Van der Steil Van der St			Native		Unknown	Greenhouse	Duna grace		Field	Whole soil	Community	Alone	Total biomass
2001arenariaNativegrassUnknownGreenhouseDune grassSterilized Self-FieldWhole soilCommunity HomewordAloneTotal biomass Intra-Van der Putten Van der Putten Van der Putten Van der PuttenNative Cenchrusgrass AnnualLate FieldGreenhouse FieldGrassland Self- Self-Sterilized Self-Field FieldInoculum InoculumMonoculture Monoculturespecific SpecificAboveground AbovegroundVan der Putten Van der Putten et al. 2007Ichmanniana Ichmanniana Van der StoelNative PerennialGreenhouse FreenhouseGrassland GrasslandSterilized Self-Field FieldInoculum Inoculum FieldMonoculture MonocultureSpecific SpecificAboveground AbovegroundVan der StoelAmmophilaPerennialLateGreenhouseGrassland GrasslandSterilized Self-FieldInoculum Inoculum Self-Monoculture Monoculturespecific Specific Intra-Aboveground			Native		Clikilowii	Greenhouse	Dune grass		riciu	WHOIC SOII	Community	Alone	Total Ololliass
Van der Putten det al. 2007 meridionalis det al. 2007 meridionalis Native grass Late Greenhouse Grassland Sterilized Self- van der Putten Cenchrus Annual Self- van der Putten Eragrostis Perennial Van der Putten Eragrostis Perennial Van der Steel Annual Self- van der Putten Eragrostis Perennial Self- van der Putten Eragrostis Perennial Self- van der Sterilized Field Inoculum Monoculture specific Aboveground Self- van der Putten Eragrostis Perennial Self- van der Sterilized Field Inoculum Monoculture specific Aboveground Self- van der Sterilized Field Inoculum Monoculture specific Aboveground Self- van der Stoel Ammophila Perennial Self- van der Stoel Ammophila Self- van der Stoel Ammophila Perennial Self- van der Stoel Ammophila Self- van der Stoel Ammophila Self- van der Stoel Ammophila Self- van der Stoel Self- van der Stoel Self- van der Stoel Intra- van der Stoel Ammophila Self- van der Stoel Intra- van der Stoel Self- van der Stoel Intra- van der Stoel Intra- van der Stoel Self- van der Stoel Intra- van der Stoel Intra			Native		Unknown	Greenhouse	Dune grace		Field	Whole soil	Community	Alone	Total biomass
et al. 2007 meridionalis Native grass Late Greenhouse Grassland Sterilized Self- Van der Putten Cenchrus Non-native grass Early Greenhouse Grassland Sterilized Self- Van der Putten Eragrostis Perennial Native grass Late Greenhouse Grassland Sterilized Self- Van der Putten Eragrostis Perennial Native grass Late Greenhouse Grassland Sterilized Self- Van der Stoel Ammophila Perennial Self- Van der Stoel Ammophila Perennial Self- Van der Stoel Ammophila Native Grassland Sterilized Field Inoculum Monoculture Specific Aboveground Sterilized Field Inoculum Monoculture Specific Aboveground Sterilized Self- Van der Stoel Ammophila Self- Van der Stoel Self- Van der St			rative		Clikilowii	Greenhouse	Dune grass		1 icia	Whole son	Community		Total Ololliass
Van der Putten Cenchrus Annual et al. 2007 biflorus Non-native grass Early Greenhouse Grassland Sterilized Self- Van der Putten Eragrostis Perennial Van der Stoel Ammophila Annual Self- Field Inoculum Monoculture specific Aboveground Intra- Self- Self- Field Inoculum Monoculture Specific Aboveground Intra- Self- Self- Self- Self- Self- Field Inoculum Monoculture Specific Aboveground Intra- Relative total			Native		Late	Greenhouse	Grassland		Field	Inoculum	Monoculture		Aboveground
et al. 2007 biflorus Non-native grass Early Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Van der Putten Eragrostis Perennial Self- et al. 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Van der Stoel Ammophila			rative	_	Lute	Greennouse	Grassiana		1 icia	moculain	Monoculture		Hooveground
Van der PuttenEragrostisPerennialSelf-Intra-et al. 2007lehmannianaNativegrassLateGreenhouseGrasslandSterilizedFieldInoculumMonoculturespecificAbovegroundVan der StoelAmmophilaPerennialSelf-Intra-Relative total			Non-native		Farly	Greenhouse	Grassland		Field	Inoculum	Monoculture		Aboveground
et al. 2007 lehmanniana Native grass Late Greenhouse Grassland Sterilized Field Inoculum Monoculture specific Aboveground Van der Stoel Ammophila Perennial Self- Intra- Relative total		0	Tion name	_	Lurry	Greennouse	Grassiana		1 icia	moculain	Wichocanare	1	ricovegreuna
Van der Stoel Ammophila Perennial Self- Intra- Relative total		0	Native		Late	Greenhouse	Grassland		Field	Inoculum	Monoculture		Aboveground
T			1		2	_10011110 0000	2140014114						
et al. 2002 arenaria Native grass Early Greenhouse Dune grass Sterilized Field Inoculum Monoculture specific biomass	et al. 2002	arenaria	Native	grass	Early	Greenhouse	Dune grass	Sterilized	Field	Inoculum	Monoculture	specific	biomass

Appendix 2. Data used in the meta-analysis. List of references, the source of the data, sample size, mean, and standard deviation for plants grown on "self" and "other" soil. There were 272 experiments.

Author	Source	Nc	Ne	Xc	X _e	SDc	SDe
Agrawal et al. 2005	Author	8	8	5.91	6.38	1.98	2.20
Agrawal et al. 2005	Author	8	8	5.39	6.00	1.62	1.52
Agrawal et al. 2005	Author	8	8	9.96	10.25	2.31	1.87
Agrawal et al. 2005	Author	8	8	4.65	5.51	1.11	1.36
Agrawal et al. 2005	Author	8	8	5.88	5.81	1.69	1.43
Agrawal et al. 2005	Author	8	8	5.50	6.14	0.74	0.37
Agrawal et al. 2005	Author	8	8	5.00	5.56	1.74	1.93
Agrawal et al. 2005	Author	8	8	6.06	6.85	1.76	1.91
Agrawal et al. 2005	Author	8	8	7.74	7.86	1.51	1.52
Agrawal et al. 2005	Author	8	8	5.94	6.79	1.50	1.51
Agrawal et al. 2005	Author	5	5	2.76	3.42	1.18	1.50
Agrawal et al. 2005	Author	5	5	4.68	5.24	0.95	1.07
Agrawal et al. 2005	Author	5	5	6.34	6.86	0.77	1.10
Agrawal et al. 2005	Author	5	5	5.60	5.96	1.98	2.00
Agrawal et al. 2005	Author	5	5	6.10	6.68	1.13	1.45
Agrawal et al. 2005	Author	8	8	6.31	6.63	2.76	2.88
Agrawal et al. 2005	Author	8	8	5.06	6.08	1.24	1.34
Agrawal et al. 2005	Author	8	8	6.50	6.88	1.83	1.96
Agrawal et al. 2005	Author	7	7	7.27	7.47	2.09	1.85
Agrawal et al. 2005	Author	8	8	5.91	6.16	1.56	1.51
Beckstead and Parker 2003	Figure 2	8	8	0.38	1.10	0.08	0.13
Belnap et al. 2005	Figure 2	10	10	0.02	0.03	0.01	0.04
Belnap et al. 2005	Figure 2	10	10	0.02	0.02	0.01	0.05
Bever 1994	Figure 3a	9	6	2.40	1.80	0.41	0.63
Bever 1994	Figure 3a	9	9	2.40	2.60	0.41	0.63
Bever 1994	Figure 3a	9	9	2.40	2.51	0.41	0.63
Bever 1994	Figure 3a	9	9	2.40	2.40	0.41	0.41
Bever 1994	Figure 3a	9	6	1.05	2.53	0.60	0.63
Bever 1994	Figure 3a	9	9	1.05	2.10	0.60	0.63

Bever 1994	Figure 3a	9	9	1.05	1.75	0.60	0.63
Bever 1994	Figure 3a	9	9	1.05	1.78	0.60	0.66
Bever 1994	Figure 3a	9	6	2.08	2.50	0.60	0.60
Bever 1994	Figure 3a	9	9	2.08	2.09	0.60	0.57
Bever 1994	Figure 3a	9	9	2.08	2.53	0.60	0.60
Bever 1994	Figure 3a	9	9	2.08	2.53	0.60	0.63
Bezemer et al. 2006a	Figure 4	5	5	4.30	4.10	0.46	0.46
Bezemer et al. 2006a	Figure 4	5	5	4.75	4.20	0.89	0.89
Bezemer et al. 2006b	Figure 1	5	5	2.20	2.50	0.56	0.22
Bezemer et al. 2006b	Figure 1	5	5	2.15	2.50	0.22	0.22
Bezemer et al. 2006b	Figure 1	5	5	3.40	3.40	0.78	0.45
Bezemer et al. 2006b	Figure 1	5	5	2.48	2.50	0.34	0.22
Bezemer et al. 2006b	Figure 1	5	5	3.40	0.50	1.34	0.67
Bezemer et al. 2006b	Figure 1	5	5	2.30	4.30	0.89	0.89
Bezemer et al. 2006b	Figure 1	5	5	2.15	2.65	0.22	0.22
Bezemer et al. 2006b	Figure 1	5	5	3.60	2.30	1.57	0.89
Bezemer et al. 2006b	Figure 1	5	5	4.60	4.40	0.67	0.34
Bezemer et al. 2006b	Figure 1	5	5	2.90	2.80	1.12	0.22
Bezemer et al. 2006b	Figure 1	5	5	10.30	9.70	4.25	1.34
Bezemer et al. 2006b	Figure 1	5	5	7.70	6.60	2.24	1.57
Bezemer et al. 2006b	Figure 1	5	5	8.00	5.40	2.24	1.01
Bodelier et al. 2006	Figure 4a	6	6	0.45	0.76	0.24	0.25
Bodelier et al. 2006	Figure 4a	6	6	0.17	1.20	0.28	0.24
Bodelier et al. 2006	Figure 4a	6	6	1.10	1.65	0.24	0.25
Bodelier et al. 2006	Figure 4a	6	6	0.60	1.90	0.25	0.25
Bonanomi and Mazzoleni 2005	Figure 2	10	10	0.08	0.16	0.05	0.06
Bonanomi and Mazzoleni 2005	Figure 3	10	10	0.04	0.06	0.05	0.05
Bonanomi and Mazzoleni 2005	Figure 3	10	10	0.01	0.02	0.05	0.05
Bonanomi and Mazzoleni 2005	Figure 2	10	10	0.08	0.11	0.05	0.05
Bonanomi and Mazzoleni 2005	Figure 2	10	10	0.21	0.26	0.05	0.05
Bonanomi and Mazzoleni 2005	Figure 3	10	10	0.07	0.10	0.05	0.05
Bonanomi and Mazzoleni 2005	Figure 3	10	10	0.16	0.16	0.05	0.05
Bonanomi and Mazzoleni 2005	Figure 2	10	10	0.21	0.23	0.05	0.06

Bonanomi and Mazzoleni 2005	Figure 2	10	10	0.13	0.10	0.06	0.05
Bonanomi and Mazzoleni 2005	Figure 3	10	10	0.04	0.05	0.05	0.05
Bonanomi and Mazzoleni 2005	Figure 2	10	10	0.13	0.13	0.05	0.05
Bonanomi et al. 2005b	Figure 5	10	10	0.31	0.64	0.06	0.16
Callaway et al. 2004a	Figure 5	2	6	0.21	0.21	0.06	0.03
Callaway et al. 2004b	Figure 1	6	6	0.83	1.07	0.06	0.20
Callaway et al. 2004b	Figure 1	4	4	0.44	0.63	0.09	0.16
Callaway et al. 2004b	Figure 2	10	10	0.80	0.56	0.32	0.19
Callaway et al. 2004b	Figure 2	10	10	0.08	0.15	0.06	0.13
Callaway et al. 2004b	Figure 1	4	6	0.83	1.09	0.06	0.15
Callaway et al. 2004b	Figure 1	4	4	0.44	1.21	0.09	0.16
Callaway et al. 2004b	Figure 2	10	10	0.80	0.58	0.32	0.25
Callaway et al. 2004b	Figure 2	10	10	0.08	0.30	0.06	0.09
Casper and Castelli 2007	Figure 1	20	20	0.07	0.17	0.04	0.05
Casper and Castelli 2007	Figure 1	20	20	0.04	0.15	0.01	0.08
Casper and Castelli 2007	Figure 1	20	20	0.13	0.23	0.11	0.11
Casper and Castelli 2007	Figure 1	20	20	0.10	0.12	0.13	0.13
Casper and Castelli 2007	Figure 1	14	12	0.11	0.32	0.15	0.17
Casper and Castelli 2007	Figure 1	14	12	0.12	0.13	0.11	0.07
De Deyn et al. 2004a	Author	8	8	1.18	13.40	0.67	3.13
De Deyn et al. 2004a	Author	8	8	4.60	6.68	1.23	3.42
De Deyn et al. 2004a	Author	8	8	1.33	0.04	1.44	0.04
De Deyn et al. 2004a	Author	8	8	0.37	0.27	0.47	0.26
De Deyn et al. 2004a	Author	8	8	0.42	1.19	0.27	0.63
De Deyn et al. 2004a	Author	8	8	0.59	0.99	0.43	0.54
De Deyn et al. 2004a	Author	8	8	0.33	3.00	0.33	0.85
De Deyn et al. 2004a	Author	8	8	0.86	1.80	0.92	0.68
De Deyn et al. 2004a	Author	8	8	0.11	1.31	0.18	0.72
De Deyn et al. 2004a	Author	8	8	0.13	0.10	0.14	0.07
De Deyn et al. 2004a	Author	8	8	0.04	0.22	0.05	0.44
De Deyn et al. 2004a	Author	8	8	0.04	0.15	0.04	0.10
De Deyn et al. 2004a	Author	8	8	0.06	0.01	0.07	0.01
Ehlers and Thompson 2004	Figure 3b	87	87	2.60	3.20	0.47	0.56

Gillespie and Allen 2006	Figure 2a	10	10	0.18	0.27	0.05	0.06
Gillespie and Allen 2006	Figure 2a	10	10	0.18	0.22	0.05	0.09
Gillespie and Allen 2006	Figure 2a	10	10	0.18	0.15	0.05	0.05
Gustafson and Casper 2004	Figure 1	12	12	0.18	0.14	0.06	0.03
Gustafson and Casper 2004	Figure 3	12	12	0.18	0.16	0.06	0.03
Gustafson and Casper 2004	Figure 5	12	12	0.11	0.12	0.07	0.07
Gustafson and Casper 2004	Figure 5	12	12	0.11	0.07	0.07	0.04
Gustafson and Casper 2004	Figure 2	12	12	0.57	0.91	0.17	0.35
Gustafson and Casper 2004	Figure 4	12	12	0.15	0.25	0.05	0.05
Holah and Alexander 1999	Figure 1	5	5	48.09	37.23	4.47	8.90
Holah and Alexander 1999	Figure 1	5	5	48.09	54.84	4.47	2.24
Holah and Alexander 1999	Figure 1	4	5	8.00	1.90	4.40	2.90
Holah and Alexander 1999	Figure 1	4	5	8.00	8.40	4.40	7.80
Kardol et al. 2006	Figure 1	5	5	2.20	4.20	0.22	0.34
Kardol et al. 2006	Figure 1	5	5	2.20	4.30	0.67	0.37
Kardol et al. 2006	Figure 1	5	5	4.20	4.20	0.67	0.25
Kardol et al. 2006	Figure 1	5	5	4.20	4.30	0.67	0.25
Kardol et al. 2006	Figure 1	5	5	0.53	0.27	0.04	0.01
Kardol et al. 2006	Figure 1	5	5	0.68	0.28	0.07	0.01
Kardol et al. 2006	Figure 1	5	5	0.34	0.27	0.04	0.01
Kardol et al. 2006	Figure 1	5	5	0.34	0.28	0.04	0.00
Kardol et al. 2006	Figure 1	5	5	4.40	5.60	0.45	0.13
Kardol et al. 2006	Figure 1	5	5	5.10	5.50	0.67	0.66
Kardol et al. 2006	Figure 1	5	5	5.30	5.60	0.67	0.16
Kardol et al. 2006	Figure 1	5	5	5.30	5.40	0.67	1.50
Kardol et al. 2007	Author	5	5	8.33	9.58	1.14	0.43
Kardol et al. 2007	Author	5	5	0.94	1.56	0.07	0.17
Kardol et al. 2007	Author	5	5	0.94	1.65	0.07	0.27
Kardol et al. 2007	Author	5	5	0.94	1.67	0.07	0.20
Kardol et al. 2007	Author	5	5	0.94	1.40	0.07	0.14
Kardol et al. 2007	Author	5	5	0.94	1.41	0.07	0.16
Kardol <i>et al.</i> 2007	Author	5	5	0.18	0.45	0.07	0.17
Kardol <i>et al.</i> 2007	Author	5	5	6.44	7.95	0.74	0.26

Kardol et al. 2007	Author	5	5	1.55	2.02	0.29	0.18
Kardol et al. 2007	Author	5	5	1.55	2.25	0.29	0.13
Kardol et al. 2007	Author	5	5	1.55	2.05	0.29	0.15
Kardol et al. 2007	Author	5	5	1.55	1.73	0.29	0.12
Kardol et al. 2007	Author	5	5	1.55	1.95	0.29	0.33
Kardol <i>et al</i> . 2007	Author	5	5	0.76	1.56	0.10	0.40
Kardol <i>et al</i> . 2007	Author	5	5	6.31	7.97	1.52	0.90
Kardol <i>et al</i> . 2007	Author	5	5	1.21	1.35	0.28	0.19
Kardol <i>et al</i> . 2007	Author	5	5	1.21	1.44	0.28	0.24
Kardol <i>et al</i> . 2007	Author	5	5	1.21	1.84	0.28	0.12
Kardol <i>et al</i> . 2007	Author	5	5	1.21	1.33	0.28	0.10
Kardol et al. 2007	Author	5	5	1.21	1.52	0.28	0.09
Kardol et al. 2007	Author	5	5	0.68	2.85	0.09	0.34
Kardol et al. 2007	Author	5	5	6.18	6.40	0.74	0.13
Kardol et al. 2007	Author	5	5	1.12	1.31	0.06	0.08
Kardol et al. 2007	Author	5	5	1.12	1.32	0.06	0.10
Kardol et al. 2007	Author	5	5	1.12	1.25	0.06	0.09
Kardol et al. 2007	Author	5	5	1.12	1.19	0.06	0.23
Kardol et al. 2007	Author	5	5	1.12	1.28	0.06	0.04
Kardol et al. 2007	Author	5	5	0.60	0.75	0.05	0.04
Kardol et al. 2007	Author	5	5	7.67	9.08	1.01	0.64
Kardol et al. 2007	Author	5	5	1.24	2.24	0.23	0.71
Kardol et al. 2007	Author	5	5	1.24	2.41	0.23	0.18
Kardol et al. 2007	Author	5	5	1.24	2.27	0.23	0.19
Kardol et al. 2007	Author	5	5	1.24	1.74	0.23	0.12
Kardol et al. 2007	Author	5	5	1.24	1.98	0.23	0.10
Kardol <i>et al</i> . 2007	Author	5	5	0.10	1.58	0.03	0.16
Kardol <i>et al</i> . 2007	Author	5	5	6.35	8.63	3.47	0.86
Kardol et al. 2007	Author	5	5	0.47	1.13	0.12	0.32
Kardol et al. 2007	Author	5	5	0.47	1.19	0.12	0.31
Kardol et al. 2007	Author	5	5	0.47	0.97	0.12	0.40
Kardol et al. 2007	Author	5	5	0.47	1.20	0.12	0.38
Kardol et al. 2007	Author	5	5	0.47	1.14	0.12	0.19

Kardol <i>et al</i> . 2007	Author	5	5	0.36	0.95	0.16	0.16
Klironomos 2002	Author	10	10	5.90	5.60	0.60	0.90
Klironomos 2002	Author	10	10	9.80	11.10	2.30	1.70
Klironomos 2002	Author	10	10	4.80	6.40	0.60	0.40
Klironomos 2002	Author	10	10	3.80	4.80	0.30	0.80
Klironomos 2002	Author	10	10	5.90	6.90	0.40	0.50
Klironomos 2002	Author	10	10	2.60	3.30	0.50	0.70
Klironomos 2002	Author	10	10	6.90	7.40	1.60	0.80
Klironomos 2002	Author	10	10	3.60	4.10	1.20	0.50
Klironomos 2002	Author	10	10	3.40	3.00	0.80	0.70
Klironomos 2002	Author	10	10	9.30	9.30	1.60	1.60
Klironomos 2002	Author	10	10	1.20	1.70	0.90	0.80
Klironomos 2002	Author	10	10	2.40	3.00	0.70	0.60
Klironomos 2002	Author	10	10	2.10	2.80	0.40	0.60
Klironomos 2002	Author	10	10	3.40	4.30	0.90	0.60
Klironomos 2002	Author	10	10	4.00	4.90	1.20	0.60
Klironomos 2002	Author	10	10	7.20	8.30	0.70	0.80
Klironomos 2002	Author	10	10	10.80	14.70	2.70	1.80
Klironomos 2002	Author	10	10	14.20	13.60	2.80	2.40
Klironomos 2002	Author	10	10	4.80	5.90	0.60	0.40
Klironomos 2002	Author	10	10	8.20	8.30	0.90	0.70
Klironomos 2002	Author	10	10	7.70	8.80	1.50	1.20
Klironomos 2002	Author	10	10	5.30	6.00	0.50	0.40
Klironomos 2002	Author	10	10	2.20	2.40	0.80	0.70
Klironomos 2002	Author	10	10	1.90	2.30	0.50	0.60
Klironomos 2002	Author	10	10	8.60	9.00	0.90	1.30
Klironomos 2002	Author	10	10	5.90	5.80	0.60	0.40
Klironomos 2002	Author	10	10	4.10	5.10	0.50	0.40
Klironomos 2002	Author	10	10	8.00	8.90	1.00	1.30
Klironomos 2002	Author	10	10	3.80	3.50	0.80	1.40
Klironomos 2002	Author	10	10	1.20	1.80	0.70	0.50
Klironomos 2002	Author	10	10	1.40	1.90	0.70	0.70
Klironomos 2002	Author	10	10	2.00	2.50	0.60	0.50

	4.0	4.0	• • •	• • •		0.40
						0.40
						0.60
Author	10	10		11.60	2.30	2.00
Author	10	10	9.80	11.20	1.40	1.20
Author	10	10	0.80	1.10	0.70	0.80
Author	10	10	6.50	7.90	0.80	0.70
Author	10	10	3.50	4.70	0.70	0.70
Author	10	10	11.60	12.40	3.50	1.90
Author	10	10	3.40	4.40	0.90	0.60
Author	10	10	3.90	5.30	0.70	0.70
Author	10	10	2.90	3.10	0.80	0.80
Author	10	10	8.90	10.10	2.60	1.80
Author	10	10	4.90	5.60	1.60	1.10
Author	10	10	3.30	3.30	0.90	0.40
Author	10	10	5.20	6.00	0.30	0.70
Author	10	10	8.40	6.70	1.50	1.40
Author	10	10	1.50	2.00	0.60	0.70
Author	10	10	8.20	7.20	0.30	0.40
Author	10	10	2.30	2.70	0.70	0.60
Author	10	10	3.00	4.20	0.60	0.40
Author	10	10	17.00	15.80	3.60	3.50
Author	10	10	9.90	10.30	0.90	1.80
Author	10	10	8.40	8.30	0.50	0.50
Author	10	10	8.30	8.20	0.80	0.90
Author	10	10	8.40	10.60	1.80	0.90
Author	10	10	3.60	4.50	0.50	0.50
Author	10	10	4.20	5.40	0.40	0.70
Author	10	10	4.40	6.30	0.70	0.80
Author	10	10	5.50	5.70	1.30	0.80
Figure 2	5	5	3.84	2.64	0.30	0.24
Figure 1	40	40	39.00	9.30	18.97	9.49
Figure 1	40	40	8.50	6.50	5.06	4.43
Author	240	180	8.78	1.00	16.61	0.00
	Author	Author 10	Author 10 10 Autho	Author 10 10 1.80 Author 10 10 11.80 Author 10 10 9.80 Author 10 10 0.80 Author 10 10 10 6.50 Author 10 10 10 3.50 Author 10 10 10 11.60 Author 10 10 10 3.40 Author 10 10 10 3.90 Author 10 10 10 8.90 Author 10 10 10 8.90 Author 10 10 10 3.30 Author 10 10 10 8.20 Author 10 10 10 8.40 Author 10 10 10 8.20 Author 10 10 8.20 Author 10 10 8.20 Author 10 10 8.20 Author 10 10 8.30 Author 10 10 8.40 Author 10 10 4.20 Author 10 10 4.20 Author 10 10 5.50 Figure 2 5 5 3.84 Figure 1 40 40 39.00 Figure 1 40 40 8.50	Author 10 10 3.80 3.90 Author 10 10 11.80 11.60 Author 10 10 9.80 11.20 Author 10 10 0.80 1.10 Author 10 10 6.50 7.90 Author 10 10 3.50 4.70 Author 10 10 11.60 12.40 Author 10 10 3.40 4.40 Author 10 10 3.90 5.30 Author 10 10 3.90 5.30 Author 10 10 8.90 10.10 Author 10 10 3.30 3.30 Author 10 10 8.40 6.70 Author 10 10 8.40 6.70 Author 10 10 8.20 7.20 Author 10 10 3.00 4.20 Author 10 10 3.00 4.20 Author 10 10 8.40 8.30 Author 10 10 4.20 5.40 Author 10 10 4.20 5.40 Author 10 10 4.40 6.30 Author 10 10 5.50 5.70 Figure 2 5 5 3.84 2.64 Figure 1 40 40 39.00 9.30 Figure 1 40 40 39.00 9.30	Author 10 10 3.80 3.90 0.60 Author 10 10 11.80 11.60 2.30 Author 10 10 9.80 11.20 1.40 Author 10 10 0.80 1.10 0.70 Author 10 10 6.50 7.90 0.80 Author 10 10 10 3.50 4.70 0.70 Author 10 10 11.60 12.40 3.50 Author 10 10 3.40 4.40 0.90 Author 10 10 3.90 5.30 0.70 Author 10 10 8.90 10.10 2.60 Author 10 10 8.90 10.10 2.60 Author 10 10 3.30 3.30 0.90 Author 10 10 3.840 6.70 1.50 Author 10 10 8.840 6.70 1.50 Author 10 10 8.840 6.70 1.50 Author 10 10 8.20 7.20 0.30 Author 10 10 8.40 8.30 0.50 Author 10 10 8.40 10.60 1.80 Author 10 10 8.40 6.30 0.70 Author 10 10 4.20 5.40 0.40 Author 10 10 4.40 6.30 0.70 Author 10 10 4.40 6.30 0.70 Author 10 10 4.40 6.30 0.70 Author 10 10 5.50 5.70 1.30 Figure 2 5 5 3.84 2.64 0.30 Figure 1 40 40 39.00 9.30 18.97 Figure 1 40 40 39.00 9.30 18.97

Kulmatiski, unpubl. data	Author	180	180	16.14	5.36	17.76	6.25
Kulmatiski, unpubl. data	Author	240	180	8.37	15.25	9.56	17.64
Kulmatiski, unpubl. data	Author	180	180	9.02	4.94	8.11	4.05
Kulmatiski, unpubl. data	Author	240	180	7.13	4.50	9.42	5.50
Kulmatiski, unpubl. data	Author	180	180	12.76	5.62	10.75	5.82
Meiman et al. 2006	Author	12	12	0.33	0.36	0.41	0.41
Morris et al. 2006	Table 3, Text	5	5	7.40	6.50	0.67	0.67
Niu et al 2007	Figure 4	4	4	6.00	5.56	0.50	0.70
Niu et al 2007	Figure 4	4	4	5.74	6.73	0.40	0.51
Niu et al 2007	Figure 4	4	4	5.90	4.40	0.30	0.27
Niu et al 2007	Figure 4	4	4	5.90	6.44	0.38	0.38
Niu et al 2007	Figure 4	4	4	10.00	11.89	0.94	0.56
Niu et al 2007	Figure 4	4	4	10.00	9.60	0.94	0.80
Niu et al 2007	Figure 4	4	4	6.79	5.10	0.40	0.70
Niu et al 2007	Figure 4	4	4	6.79	8.77	0.54	0.42
Packer and Clay 2000	Figure 2	125	125	0.11	0.11	0.03	0.05
Packer and Clay 2000	Figure 2	125	125	0.16	0.13	0.06	0.06
Packer and Clay 2000	Figure 2	125	125	0.16	0.15	0.05	0.04
Packer and Clay 2000	Figure 2	125	125	0.12	0.13	0.06	0.09
Peltzer 2001	Figure 2	10	10	1.02	1.02	1.01	1.01
Peltzer 2001	Figure 2	10	10	1.01	1.01	1.00	1.00
Puerta-Pinero et al. 2006	Table 2	20	20	0.38	0.58	0.40	0.18
Puerta-Pinero et al. 2006	Table 2	20	20	0.38	0.26	0.40	0.27
Puerta-Pinero et al. 2006	Table 2	20	20	0.38	0.57	0.40	0.27
Puerta-Pinero et al. 2006	Table 2	20	20	0.38	0.33	0.40	0.31
Puerta-Pinero et al. 2006	Table 2	20	20	0.38	0.36	0.40	0.27
Puerta-Pinero et al. 2006	Table 2	20	20	0.38	0.31	0.40	0.27
Puerta-Pinero et al. 2006	Table 2	20	20	0.38	0.70	0.40	0.27
Reinhart and Callaway 2004	Figure 2	12	12	28.81	29.72	16.07	19.23
Reinhart and Callaway 2004	Figure 2	12	12	16.90	17.60	11.71	11.22
Reinhart and Callaway 2004	Figure 2	12	12	28.81	39.81	16.07	38.76
Reinhart and Callaway 2004	Figure 2	12	12	16.90	21.83	11.71	7.79
Reinhart and Callaway 2004	Figure 2	9.5	9.5	5.85	11.40	6.16	10.79

Reinhart and Callaway 2004	Figure 2	8	8	6.00	10.50	5.66	8.49
Reinhart and Callaway 2004	Figure 2	9	9	3.12	5.00	4.50	4.68
Reinhart and Callaway 2004	Figure 2	9.5	9.5	5.85	14.80	6.16	13.87
Reinhart and Callaway 2004	Figure 2	8	8	6.00	13.00	5.66	12.73
Reinhart and Callaway 2004	Figure 2	9	9	3.12	7.12	4.50	7.89
Reinhart et al. 2003	Figure 2b	14.5	14.5	0.33	0.30	0.08	0.11
Reinhart et al. 2003	Figure 2b	11.5	11.5	0.31	0.21	0.12	0.11
Reinhart et al. 2003	Figure 2b	11.5	11.5	1.14	1.36	0.48	0.44
Reinhart et al. 2003	Figure 2b	11.5	11.5	0.80	0.80	0.27	0.34
Reinhart et al. 2003	Figure 2b	11.5	11.5	1.14	0.98	0.48	0.47
Reinhart et al. 2003	Figure 2b	11.5	11.5	0.80	0.45	0.27	0.27
Reinhart et al. 2003	Figure 2b	14.5	14.5	0.33	0.45	0.08	0.08
Reinhart et al. 2003	Figure 2b	11.5	11.5	0.32	0.20	0.12	0.08
Reinhart et al. 2005a	Figure 1	22	22	52.77	64.38	28.14	21.48
Reinhart et al. 2005a	Figure 1	22	22	52.77	69.24	28.14	20.50
Reinhart et al. 2005b	Figure 5	20	20	2.83	1.95	1.65	0.89
Reinhart et al. 2005b	Figure 5	20	20	4.25	3.80	3.80	2.24
Suding et al. 2004	Figure 2	10	10	0.45	0.31	0.22	0.19
Suding et al. 2004	Figure 4	6	6	0.70	0.23	0.15	0.07
Suding et al. 2004	Figure 2	10	10	0.58	0.75	0.19	0.19
Suding et al. 2004	Figure 4	6	6	0.61	0.13	0.29	0.06
Suguenza et al. 2006	Figure 1b	10	10	1.20	1.02	0.32	0.22
Troelstra et al. 2001	Author	15	15	2.08	2.58	0.39	0.44
Troelstra et al. 2001	Author	15	15	3.88	3.99	0.46	0.56
Troelstra et al. 2001	Author	10	10	2.09	2.48	0.42	0.40
Troelstra et al. 2001	Author	10	10	1.70	2.12	0.61	0.72
Van der Putten et al. 2007	Figure 1	5	5	4.66	1.98	3.35	3.35
Van der Putten et al. 2007	Figure 1	5	5	18.05	9.51	6.71	6.71
Van der Putten et al. 2007	Figure 1	5	5	15.91	19.94	3.58	8.94
Van der Stoel et al. 2002	Figure 2	5	5	39.50	100.00	28.17	0.00