1	Running head: Plant-soil feedback meta-analysis
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4	Plant-soil feedbacks: A meta-analytical review
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20 ABSTRACT

21

22 Recent studies suggest that plant-soil feedbacks (PSFs) may provide mechanisms for plant 23 diversity, succession, and invasion. To determine whether there is general support for these 24 hypotheses, we conducted a meta-analysis of PSF experiments, determining effect sizes among 25 plant types, ecosystems, and experimental approaches. Overall, PSFs had a medium negative 26 effect size, indicating that most plants create soils that decrease growth of conspecifics. PSFs 27 were very large and negative for annual and early-successional species, supporting the 28 hypothesis that PSFs maintain diversity by accelerating species replacement (e.g., succession). 29 Across all studies, non-native plants did not benefit from PSFs; however, in studies that 30 measured non-native and native PSFs in the same study system, non-natives did benefit from 31 PSFs. In a comparison of life-forms, grasses demonstrated more negative PSFs than forbs, 32 shrubs, and trees. A review of PSF methodologies showed that experiments using 33 sterilized/inoculated soils, greenhouse conditions, and manipulative experiments to cultivate 34 soils exaggerated PSFs compared to experiments that used whole field soils, field conditions, and 35 natural experiments to cultivate soils, respectively. Our findings provide broad support for the 36 role of PSFs in plant community assembly, but also underscore the need for expanded testing 37 under field conditions.

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41 INTRODUCTION

42

43	In the last five years, there has been a rapid increase in theoretical and experimental plant-soil
44	feedback (PSF) research. This research has suggested that PSFs are an under-explored factor
45	that can determine plant abundance, persistence, invasion, and succession (Bever 1994, 2003;
46	Callaway et al. 2004b; Ehrenfeld 2005; Kardol et al. 2007). Because of the growing
47	appreciation for the role of PSFs, it is now possible to use a meta-analytical approach to test
48	theoretical predications regarding the role of PSFs in plant community assembly across species
49	and ecosystem types. However, differences in methodologies among studies require that
50	previously untested biases associated with these methodologies also be examined.
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52	Which species, processes, and ecosystems are most likely to be affected by PSFs?
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reciprocal species replacements, and positive feedbacks decrease plant diversity as a result of
positive frequency dependence (Bever *et al.* 1997).

65 Alternatively, a second hypothesis predicts that PSFs are positive early in succession and 66 become more negative later in succession (Reynolds et al. 2003). In this hypothesis, symbioses 67 are assumed to be critical to plant growth in high stress (i.e., early-successional, high latitude, 68 and high altitude) growth conditions (Reynolds et al. 2003). As plant growth increases across 69 successional sequences, pathogen accumulation is expected to produce negative PSFs (Reynolds 70 et al. 2003). Few studies have explicitly addressed the role of PSFs in successional systems, but 71 many PSF experiments have been performed on early-, mid-, and late-successional plant species. 72 A review of published data, therefore, can be expected to identify patterns of PSFs across 73 successional sequences in a wide array of ecosystems.

74 PSFs have also gained attention as a mechanism that could explain the abundance and 75 persistence of non-native, invasive plants (Reinhart & Callaway 2006). More specifically, soils 76 in adoptive habitats are expected to be relatively enemy-free and symbiont-rich because root 77 herbivores and pathogens have not co-evolved to specialize on non-native species while common 78 symbionts are generalists (Callaway & Aschehoug 2000). If non-native plants can perpetuate or 79 accentuate these conditions, then a positive, or less negative, PSF will result (Klironomos 2002; 80 Reinhart & Callaway 2004; Kulmatiski et al. 2006). Thus, if PSFs are a common mechanism of 81 non-native plant invasion, then invasive plants would be expected to demonstrate positive, or 82 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.

86	Up to this point, there has been little discussion of the potential differences in PSFs among
87	different plant functional groups or ecosystems, although it might be expected that there are
88	differences. For example, some plant functional groups, such as annuals or grasses, may be
89	more susceptible to belowground enemies and hence more likely to experience negative PSFs
90	than other functional groups.
91	
92	Measuring PSFs
93	
94	PSF research is founded on two concepts: 1) plants cause species-specific changes to soils, and
95	2) plants demonstrate species-specific responses to these changes (Bever 1994; Ehrenfeld et al.
96	2005). Thus, a PSF experiment incorporates two phases. In Phase I, soils are cultivated by
97	known plant species. In Phase II, plants are grown on self-cultivated (self) and non-self-
98	cultivated (other) soils. The difference in plant growth between these two soil types is a measure
99	of PSF. Researchers have used many different methods to conduct PSF experiments. These
100	different methods were developed to address particular questions but often have limitations
101	(Kulmatiski & Kardol 2007). These methods, therefore, need to be examined to determine if
102	there are consistent methodological biases.
103	Soils in Phase I, for example, have been cultivated by naturally occurring plants (natural
104	experiment) or by experimentally-grown plants (manipulative experiment). The natural
105	experiment approach reduces the length of the experiment compared to the manipulative
106	approach, and may reflect more natural soil conditions, but is susceptible to uncontrolled
107	differences among sampling sites (Baack et al. 2006; Ellis & Weis 2006). Plants in Phase I have
108	been grown in either field-collected soils ('whole' soils) or in homogenized, sterilized soils that

109	have been inoculated with field soils ('inoculated' soils). Plants are grown on sterilized,
110	inoculated soils to isolate plant-microbe feedbacks from plant-nutrient feedbacks (Bever 1994).
111	This approach allows controlled tests of microbial feedbacks, but may not reflect plant-microbe
112	feedbacks in field soils, because field soils contain large, diverse microbial communities
113	(Troelstra et al. 2001; Ehrenfeld 2003; Sanchez-Moreno & Ferris 2007).
114	In Phase II, 'other' soils have been either sterilized soils or soils cultivated by other plant
115	species. The use of sterilized soils provides information about a plant's relationship to its own
116	soil, but does not provide information about how different plant species respond to each other's
117	soils. Plant growth of the target species in Phase II has been measured using a single individual,
118	multiple individuals, or individuals of the target species within plant communities. Similarly,
119	most research has measured species-level PSFs, but two recent studies have attempted to
120	measure whole plant community responses to differently cultivated soils (Kulmatiski et al. 2006;
121	Kardol et al. 2007). PSFs measured using individual plants or individual species may isolate
122	PSF effects on that species, but it is not known if PSFs would be smaller or larger in plant
123	communities.
124	This study used a meta-analytical approach to address the following questions: 1) Do
125	early-successional species realize more negative feedbacks than late-successional species? 2) Do
126	natives realize more negative feedbacks than non-natives? 3) Do PSFs differ among life forms

127 (i.e., grass, forb, shrub, or tree) or ecosystems? and 4) Do differences in experimental approaches

128 influence PSFs? More specifically, 5) Do natural and manipulative experiments produce

129 different PSFs? 6) Do inoculation and self-sterilized techniques over-estimate PSFs? 7) Does

130 competition in Phase II growth exaggerate PSFs?, and 8) Do single plant species and plant

131 communities respond similarly to changes in the soil?

132 METHODS

133

134	Our meta-analysis included studies that measured the effects of 'self' and 'other' soils on plant
135	growth of target species. Self soils were soils that were either experimentally cultivated by a
136	target species or field-collected in an area that was described as dominated or co-dominated by
137	the target species. Other soils were soils that have been sterilized or cultivated by non-target
138	plant species. This simple ruleset for data collection provided a robust basis for the meta-
139	analytical approach (Lortie & Callaway 2006).
140	All manuscripts were located by searching keywords in Web of Science for the terms
141	"plant, soil and feedback", "soil, feedback and experiment", or "plant, soil and transplant",
142	examining references within, and by obtaining unpublished data. We excluded manuscripts that
143	examined only the effects of components of the soil community (e.g., pathogens, fungi, or
144	mycorrhizae), (2) only examined N-fixing species, because these were expected to produce a
145	sampling bias toward positive PSFs, or (3) focused solely on agricultural systems.
146	We treated experiments where investigators subjected different species to the same
147	treatments, or the same species to different treatments as separate experiments (Gurevitch &
148	Hedges 1999; Gurevitch & Hedges 2001). Different measures on the same experiment were
149	excluded. Aboveground biomass was the most commonly used response variable. Where other
150	response variables were reported, the response variable that linked best to aboveground plant
151	growth was used.
152	Successional stages were determined using the following rules. Annuals, biennials, and
153	short-lived perennials were defined as early successional; species were defined as mid-
154	successional only if the authors defined them as such; species described as dominant in their

155 ecosystem were defined as late successional; and species not assigned to any of these classes

156 were defined as unknown. Other classifications, such as life form, ecosystem type, and native or

157 non-native, were derived directly from manuscripts. In a separate analysis conducted only on

158 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

160 (http://plants.usda.gov/index.html), which only lists US species. Appendices A and B list the

161 complete dataset.

162 To determine if plant growth differed between self and other soils, mixed model meta-163 analyses were performed (Gurevitch & Hedges 2001). For each experiment, we calculated an 164 effect size, Hedges' *d* (Hedges & Olkin 1985):

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

165

166 where $X_{\rm C}$ is the mean of growth on 'other' and $X_{\rm E}$ is the growth on 'self'. The pooled 167 standard deviation is given by:

$$SD_{pooled} = \sqrt{\frac{(n_{E} - 1)(SD_{E})^{2} + (n_{C} - 1)(SD_{C})^{2}}{n_{E} + n_{C} - 2}}$$

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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:

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

173 One can think of the effect size *d* as the difference between the species' growth on their 174 own and other soil, measured in units of standard deviations (analogous to a *t* statistic). A 175 positive value of *d* indicates that plants grow better on 'self' soils than on 'other' soils, whereas a

of <i>d</i> 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
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effect, 0.5 is incuratin, 0.6 is large, and 1.0 indicates a very large effect. Earge 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 $_{\rm B}$ * 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

198 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 ($Q_B = 16.28$, df 201 = 2, P < 0.001). Annuals had a very large, negative effect size ($d_{i+} = -1.22$) whereas biennials and perennials had medium, negative effect sizes ($d_{i+} = -0.61$, $d_{i+} = -0.53$, respectively)(Fig. 2A). 202 203 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 other systems. We found that effect sizes differed by successional stages ($Q_B = 15.92$, df = 3, P 214 215 < 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 another ($Q_B = 0.04$, df = 1, P > 0.05). However, when the analysis was only performed on the 220 221 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 ($d_{i+} = -0.58$, n = 74) ($Q_B = 5.06$, df = 1, P < 0.05). When the same dataset was restricted to natives and non-natives, which could be categorized as non-native, weedy, or noxious (137 experiments, 5 studies), we found that there was a difference between classes with natives having a large, negative effect size ($d_{i+} = -1.12$) compared to noxious weeds having only a medium, negative effect size ($d_{i+} = -0.48$)($Q_B = 9.01$, df = 3, P < 0.05)(Fig. 2B). Experimental approaches greatly influenced effect sizes. For example, a test conducted

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 230 the greenhouse ($d_{i+} = -0.68$) whereas effect sizes for experiments performed in the field did not 231 differ from zero ($Q_B = 10.60$, df = 1, P < 0.01)(Fig 3A).

We also determined that effect sizes differed depending on whether the cultivation of soil 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 conducted a test to determine if the media used in Phase I, whether sterilized and inoculated or 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 $(d_{i+} = -0.52) (Q_B = 4.45,$ df = 1, P < 0.05)(Fig 3B).

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, respectively) and were not significantly different ($Q_B = 0.35$, df = 1, P > 0.05). However, when 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+}

244	= -0.65), whereas the "self-other" method had an effect size that did not differ from zero (Q_B =
245	5.62, df = 1, $P < 0.05$)(Fig 3B).
246	We determined that plant neighborhood in Phase II influenced effect size ($Q_B = 21.23$, df
247	= 2, $P < 0.001$). Studies that measured Phase II plant growth using multiple individuals per
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
253	effect sizes were not different from zero ($n = 14$), even though studies measuring species-level
254	responses had medium, negative effect sizes (d_{i+} = -0.63, n = 276) (Q _B = 7.28, df = 1, $P < 0.01$).
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257	DISCUSSION
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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
262	(Clark et al. 2007), and seed feeders (Morris et al. 2007); similar to those observed in meta-
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 high provide resistance (Levine <i>et al.</i> 2004), below ground herbivores, nathogens

- analyses of biotic resistance (Levine *et al.* 2004), belowground herbivores, pathogens,
- 266 pathogenic fungi, and nematodes (Morris *et al.* 2007).

267	PSFs may be even more important than suggested by these comparisons because both
268	positive (25% of experiments) and negative PSFs were observed, while most effect sizes in other
269	meta-analyses were in one direction. For example, competitors rarely facilitated growth in the
270	meta-analysis of biotic resistance so nearly all effect sizes of biotic resistance were negative
271	(Levine et al. 2004). The absolute value of effect size provides an estimate of effect size that is
272	not affected by the sign of the value. The average absolute value of effect sizes in this meta-
273	analysis was 1.24, which is comparable to the effect of biotic resistance (Levine et al. 2004). In
274	summary, this review indicates that, relative to many other plant growth factors, PSFs are
275	important.
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277	Plant types
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279	Annuals and early-successional species realized very large negative PSFs and perennials and
279 280	Annuals and early-successional species realized very large negative PSFs and perennials and late-successional species realized significantly less negative PSFs. This contradicts the
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280 281 282 283 283	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 <i>et al.</i> 2003), and provides widespread support for the hypothesis that negative PSFs increase the rate of succession (Van der Putten 1997; Kardol <i>et al.</i> 2007). Because early-successional species, which typically demonstrate the greatest maximum growth
280 281 282 283 284 285	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 <i>et al.</i> 2003), and provides widespread support for the hypothesis that negative PSFs increase the rate of succession (Van der Putten 1997; Kardol <i>et al.</i> 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
280 281 282 283 284 285 286	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 <i>et al.</i> 2003), and provides widespread support for the hypothesis that negative PSFs increase the rate of succession (Van der Putten 1997; Kardol <i>et al.</i> 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

290	sensitivity to belowground enemies, we suggest that high growth rates, high root:shoot ratios,
291	greater root longevity, and a larger proportion of roots near the soil surfaces increase grass
292	exposure to belowground enemies (Gleeson & Tilman 1994; Schenk & Jackson 2002; Wilsey &
293	Polley 2006). Because woody plants did not have large negative PSFs (this study), and they are
294	not as affected by biotic resistance (Levine et al. 2004) or pathogens (Morris et al. 2007), woody
295	plants appear to be less sensitive to belowground enemies and competitors than herbaceous
296	plants.
297	
298	Non-native plants
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300	Identifying mechanisms of non-native plant success is a central theme in invasion ecology.
301	Several studies suggest that PSFs may explain how non-native, invasive plants maintain dense,
302	persistent populations (Klironomos 2002; Agrawal et al. 2005; Kulmatiski 2006; Reinhart &
303	Callaway 2006). This review, however, found that non-natives, in general, do not benefit from
304	PSFs relative to natives. It should be noted, however, that non-natives were comprised of a
305	larger proportion of early-successional species (90%) than natives (47%). Thus, because early-
306	successional species demonstrated some of the most negative PSFs, non-native PSFs were
307	actually less negative than expected based on their successional stage. Because species with less
308	negative PSF are thought to outcompete species with more negative PSFs (Bever et al. 1997;
309	Eppstein & Molofsky 2007), this suggests that non-natives are more likely to invader early-
310	successional native communities than in late-successional native communities.
311	To better control our test of PSFs among native and non-native species, we conducted an
312	analysis that included only studies with data for natives and non-natives in the same system

313	(Lortie & Callaway 2006). Most studies excluded from this conservative dataset examined
314	natives (88%). After removing these studies, the effect size for native plants was more negative.
315	This could not be explained by a difference in the proportion of annuals and perennials because
316	natives were represented by 20 and 24% annuals and 74 and 74% perennials in the conservative
317	and full datasets, respectively. For non-natives, effect size did not differ between the two
318	datasets. The fact that natives had more negative effect sizes in studies that included both native
319	and non-native species indicates that invasion success may be a function of the invaded
320	community and not the invasive plant.
321	When we further divided this analysis to distinguish PSFs realized by non-native, weedy,
322	and noxious plants from PSFs realized by native plants, we found that noxious non-natives, those
323	of the greatest concern, had the least negative effect sizes. Thus, to summarize, in general native
324	and non-native plant effect sizes do not differ, but in studies that examine both natives and non-
325	natives, native communities are more susceptible to invasion (i.e., have more negative effect
326	sizes). Within these communities, the worst invaders benefit the most from PSFs.
327	Results from this meta-analysis and other reviews of plant invasions indicate that
328	invasion success is correlated with early-successional plant traits (Rejmanek 1996; Reichard &
329	Hamilton 1997; Prinzing et al. 2002). This raises an interesting question: why would species
330	with the most negative PSFs, and therefore, the least ability to maintain dense, persistent
331	populations become the most successful invaders? We suggest that early-successional species
332	have the most to gain from enemy release because growth of these species is controlled by
333	enemies. In contrast, late-successional species are likely to dedicate large amounts of resources
334	to constitutive defenses. These defenses should decrease the benefit of release from enemies and
335	also preclude rapid growth responses.

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337	Implications of different experimental methods
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339	Controlled experiments produced different results than less-controlled, more natural
340	experiments. More specifically, experiments using sterilized soil, inoculated soil, and
341	greenhouse conditions produced larger effect sizes than experiments using 'other' soil, whole
342	field soil, and field conditions, respectively. Similarly, the manipulative-experiment method
343	produced larger effect sizes than the natural-experiment method. Highly controlled experiments
344	have similarly been found to produce larger effect sizes in studies of enemy and mutualist effects
345	on plants (Morris et al. 2007). These findings contradict the suggestion that PSFs will be more
346	important in microbially-rich soils (Reynolds et al. 2003). Rather, it appears that microbially-
347	rich soils provide functional redundancy and disease suppressiveness that minimizes the
348	importance of PSFs (Sanchez-Moreno & Ferris 2007).
349	
350	Plant community-level PSFs
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352	Plant communities were used in two types of feedback experiments. In the first type, species-
353	level responses of plants grown alone, in monocultures (intraspecific competition), or in mixed
354	communities (interspecific competition) were compared. PSFs of plants grown in monocultures
355	produced the largest (i.e., most negative) feedback effects. This suggests that intraspecific
356	competition exaggerates PSFs relative to PSFs measured on plants grown alone or with other
357	species (Kardol et al. 2007).

358	In the second type, PSFs were assessed using whole plant communities (Kulmatiski et al.
359	2006; Kardol et al. 2007). These studies measured the biomass response of all plant species
360	grown on self and other soils. Conclusions drawn from two studies should be taken with caution,
361	but community-level PSFs produced the only class of data for which the mean effect size was
362	positive (0.22), though not significantly different from zero. In contrast, species-level PSFs, as
363	already described, were medium and negative (-0.63).
364	PSF models of interacting species provide some insight into why community-level
365	responses may be less negative than species-level responses. Bever et al. (1997) demonstrated
366	that for two species to coexist plant growth on 'other' soil had to be greater than plant growth on
367	'self' soil, otherwise the species that benefits most from its own growth will competitively
368	exclude the other. From this, we might expect that co-existing species in a community grow
369	better than species in a monoculture. Our data supports the idea that community-level PSF are
370	less negative than individual-level PSFs.
371	
372	
373	CONCLUSIONS
374	
375	Plants, in general, realized negative PSFs. Negative PSFs are predicted to encourage species
376	replacements and therefore increase plant diversity and successional processes. Consistent with
377	these model predictions, we found that annual and early-successional species realized the most
378	negative PSFs. Among plant types, grasses and grasslands realized the most negative PSFs. We
379	suggest that this may reflect greater growth rates and exposure to belowground enemies, though

380 further research is needed to address these hypotheses. Non-native plants, in general, did not

benefit from PSFs, though they did demonstrate less negative PSFs than native plants in thesystems 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.

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568 Table 1. Studies included in the meta-analyses and the number of experiments (means, standard

569 deviations, and sample size for control and experimental groups) extracted from each paper.

570

Study	Reference	Experiments
1	Agrawal <i>et al.</i> 2005	20
2	Beckstead and Parker 2003	1
3	Belnap <i>et al.</i> 2005	2
4	Bever 1994	12
5	Bezemer <i>et al.</i> 2006a	2
6	Bezemer <i>et al.</i> 2006b	13
7	Bodelier <i>et al.</i> 2006	4
8	Bonanomi and Mazzoleni 2005a	11
9	Bonanomi <i>et al.</i> 2005b	1
10	Callaway <i>et al.</i> 2004a	1
11	Callaway <i>et al.</i> 2004b	8
12	Casper and Castelli 2007	6
12	De Deyn <i>et al.</i> 2004a	13
13	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 <i>et al.</i> 2006	12
19	Kardol <i>et al.</i> 2007	42
20	Klironomos 2002	61
20	Knevel <i>et al.</i> 2004	1
22	Kulmatiski <i>et al.</i> 2006	2
23	Kulmatiski unpublished data	$\frac{2}{6}$
24	Meiman <i>et al.</i> 2006	1
25	Morris <i>et al.</i> 2006	1
26	Niu et al 2007	8
20 27	Packer and Clay 2000	4
28	Peltzer 2001	2
20 29	Puerta-Pinero <i>et al.</i> 2006	2 7
30	Reinhart and Callaway 2004	10
31	Reinhart <i>et al.</i> 2003	8
32	Reinhart <i>et al.</i> 2005a	
33	Reinhart <i>et al.</i> 2005b	2 2
34	Suding <i>et al.</i> 2004	4
35	Suguenza <i>et al.</i> 2006	1
36	Troelstra <i>et al.</i> 2001	4
37	Van der Putten <i>et al.</i> 2007	3
38	Van der Stoel <i>et al.</i> 2007	1
50	Total =	
	10tai	270

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,
Author	Response Variable
	Native/Non-native, Perennial grass/Annual forb/Biennial forb/Perennial forb, Early/Middle/Late/Unknown,
Agrawal et al. 2005	Greenhouse, Grassland, Self-other, Manipulative, Whole soil, Monoculture, Alone, Aboveground
	Non-native, Perennial grass, Early, Greenhouse, Dune grass, Self-sterilized, Field, Whole soil, Monoculture,
Beckstead & Parker 2003	Intra-specific, Aboveground
	Native, Perennial grass, Unknown, Greenhouse, Desert, Self-other, Field, Whole soil, Monoculture, Intra-
Belnap et al. 2005	specific, Aboveground
	Native, Perennial grass, Late, Greenhouse, Grassland, Self-other/Self-sterilized, Manipulative, Inoculum,
Bever 1994	Monoculture, Intra-specific, Total biomass
	Native, Biennial forb, Early, Greenhouse, Grassland, Self-other, Manipulative, Inoculum, Community, Alone,
Bezemer et al. 2006a	Total biomass
	Native, Perennial grass, Biennial forb, Middle/Late/Unknown, Greenhouse, Grassland, Self-other,
Bezemer et al. 2006b	Manipulative, Whole soil, Monoculture, Alone, Total biomass
	Non-native, Perennial forb, Unknown, Greenhouse, Wetland, Self-sterilized, Field, Whole soil, Community,
Bodelier et al. 2006	Alone/Intraspecific, Total biomass
Bonanomi & Mazzoleni	Native, Perennial grass/Perennial forb/Perennial shrub, Late/Unknown, Greenhouse, Grassland, Self-other,
2005	Manipulative, Whole soil, Monoculture, Alone/Intraspecific/Interspecific, Total biomass
	Native, Perennial grass, Late, Greenhouse, Grassland, Self-Other, Field, Whole soil, Monoculture, Alone,
Bonanomi et al. 2005	Total biomass
	Non-native, Biennial forb, Early, Greenhouse, Grassland, Self-Other, Field, Inoculum, Community, Alone,
Callaway et al. 2004a	Aboveground
	Native/Non-native, Biennial forb, Early, Greenhouse, Grassland, Self-other/Self-sterilized,
Callaway et al. 2004b	Manipulative/Field, Inoculum, Community/Monoculture, Intra-specific, Aboveground
G	Native, Perennial grass, Middle/Late, Field, Grassland, Self-other, Field, Whole soil, Community,
Casper & Castelli 2007	Alone/Inter-specific, Aboveground
De Deyn et al. 2004	Native, Annual forb/Perennial grass/Perennial forb, Early/Middle/Late, Greenhouse, Grassland, Self-

	Sterilized, Field, Whole soil, Community, Inter-specific, Aboveground
Ehlers & Thompson 2004	Native, Perennial grass, Unknown, Field, Grassland, Self-other, Field, Whole soil, Community, Intra-specific, Aboveground
Emens & mompson 2001	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 <i>et al</i> . 2006	Community, Inter-specific, Aboveground
	Native, Annual grass/Annual forb/Perennial grass, Early, Greenhouse, Grassland, Self-other, Manipulative,
Kardol et al. 2007	Inoculum, Monoculture, Intra-specific/Interspecific, Aboveground/Total biomass
Klironomos 2002a	Native/Non-native, Perennial grass/Biennial forb/Perennial forb, Early/Middle/Unknown, Greenhouse, Grassland, Self-other, Manipulative, Whole soil, Monoculture, Alone, Total biomass
Kiironomos 2002a	Native, Perennial grass, Early, Greenhouse, Dune grass, Self-sterilized, Field, Inoculum, Monoculture, Alone,
Knevel et al. 2004	Total biomass
Kilevel et ul. 2004	Native/Non-native, Community, Middle/Late, Field, Shrub steppe, Self-other, Field, Whole soil, Community,
Kulmatiski et al. 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 et al. 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
Peltzer 2001	Native, Annual grass, Early, Field, Grassland, Self-other, Field, Whole soil, Community, Alone/Interspecifc, Growth
Pelizer 2001	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,
Termart & Canaway 2004	

Perennial tree, Middle/Unknown, Greenhouse, Forest, Self-other/Self-sterilized, Field, ity, Alone/Intra-specific, Aboveground
ity Alana/Intro manific Abayamayand
nty, Alone/Intra-specific, Aboveground
ee, Middle/Unknown, Greenhouse, Forest, Self-other/Self-sterilized, Field, Inoculum,
pecific, Seedling survival %
Perennial tree, Middle/Late, Field, Forest, Self-other, Field, Whole soil, Community,
reground
ass/Perennial forb, Late, Field, Alpine, Self-other, Field, Whole soil, Community, Intra-
ic, Relative abundance/Relative growth
rub, Late, Greenhouse, Shrub steppe, Self-sterilized, Field, Inoculum, Community, Alone,
ass, Unknown, Greenhouse, Dune grass, Self-sterilized, Field, Whole, Community,
SS
Annual grass/Perennial grass, Early/Late, Greenhouse, Grassland, Self-sterilized, Field,
ture, Intra-specific, Aboveground
ass, Early, Greenhouse, Dune grass, Self-sterilized, Field, Inoculum, Monoculture, Intra-
tal 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.

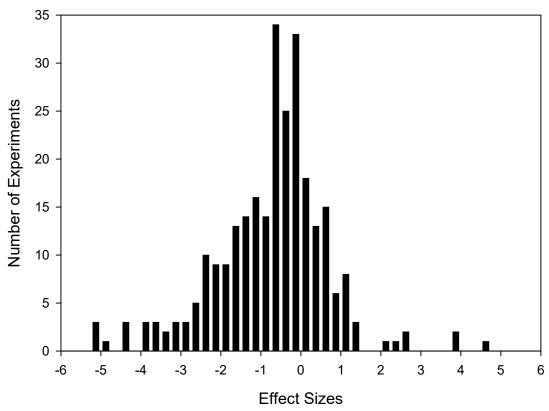


Figure 1. Number of plant-soil feedback experiments by effect size. Negative effect sizes suggest that plants grow better on 'other' than on 'self' cultivated soil. Three outliers beyond -6 are not shown (n = 290 experiments).

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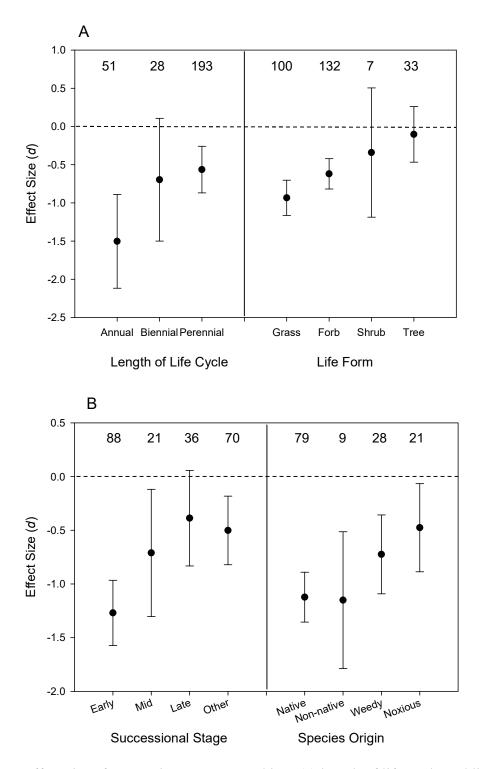


Figure 2. Effect sizes for experiments separated into (a) length of life cycle and life form classes, and (b) successional stage and species origin. Sample sizes are indicated at the top.

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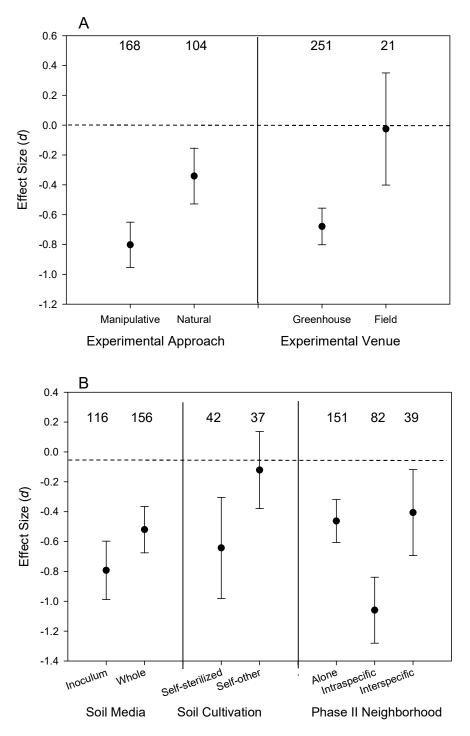


Figure 3. Effect sizes for experiments separated into (a) experimental approach, whether the soils in Phase I are cultivated through a manipulative or natural experiment, and experimental venue, and (b) soil media or volume used in Phase I, soil cultivation method, and target species neighborhood in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

			1						Inoculum	Phase I: Cultivated by Monoculutr		
	Target	Species	Growth		Experimental	TT 1 • 4 4		Phase 1	or Whole	e or	Phase II	Response
Author	Species	origin	form	stage	setting	Habitat	Approach	(months)	soil	Community	Growth	Variable
Agrawal <i>et al.</i> 2005	Artemisia biennis	Non-native	Biennial forb	Early	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Agrawal <i>et al.</i> 2005	Artemisia campestris	Native	Biennial forb	Early	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Agrawal <i>et al.</i> 2005	Bromus inermis	Non-native	Perennial grass	Unknown	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Agrawal <i>et al.</i> 2005	Bromus kalmii	Native	Perennial grass	Unknown	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Agrawal <i>et al.</i> 2005	Campanula rapunculoide	Non-native	Perennial forb	Labreaum	Greenhouse	Crossland	Self-Other	1.0	Whole soil	Monopulture	Alono	Abayaanaynd
Agrawal <i>et al.</i> 2005	s Campanula rotundifolia	Non-native	Perennial forb	Unknown Late	Greenhouse	Grassland Grassland	Self-Other	1.0	Whole soil	Monoculture Monoculture	Alone Alone	Aboveground Aboveground
Agrawal <i>et al.</i> 2005	Cerastium		Perennial forb				Self-Other			Monoculture		e
Agrawal et al.	arvense Cerastium	Native	Biennial	Unknown	Greenhouse	Grassland		1.0	Whole soil		Alone	Aboveground
2005 Agrawal <i>et al.</i>	fontanum Elymus	Non-native	forb Perennial	Early	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
2005 Agrawal <i>et al</i> .	repens Elymus	Non-native	grass Perennial	Unknown	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
2005 Agrawal <i>et al</i> .	trachycaulus Geum	Native	grass Perennial	Middle	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
2005 Agrawal <i>et al</i> .	aleppicum Geum	Native	forb Perennial	Unknown	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
2005 Agrawal <i>et al.</i>	urbanum Lepidium	Non-native	forb Annual	Unknown	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
2005 Agrawal <i>et al</i> .	campestre Lepidium	Non-native	forb Annual	Early	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
2005 Agrawal <i>et al.</i>	densiflorum Plantago	Native	forb Annual	Early	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
2005 Agrawal <i>et al</i> .	major Plantago	Non-native	forb Annual	Early	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
2005 Agrawal <i>et al.</i>	rugellii Potentilla	Native	forb Perennial	Early	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Agrawal <i>et al.</i> 2005 Agrawal <i>et al.</i>	arguta Potentilla	Native	forb Perennial	Unknown	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
2005	recta	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Agrawal et al.	Silene	Native	Annual	Early	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground

2005	antirrhina		forb									
Agrawal et al.	Silene		Perennial									
2005	vulgaris	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	1.0	Whole soil	Monoculture	Alone	Aboveground
Beckstead and	Ammophila		Perennial				Self-				Intra-	
Parker 2003	arenaria	Non-native	grass	Early	Greenhouse	Dune grass	Sterilized	Field	Whole soil	Monoculture	specific	Aboveground
Belnap et al.	Hilaria		Perennial		~ .	_	~				Intra-	
2005	jamesii	Native	grass	Unknown	Greenhouse	Desert	Self-Other	Field	Whole soil	Monoculture		Aboveground
Belnap <i>et al.</i>	Hilaria	NT /*	Perennial	T T 1	C 1		G 16 O4	E. 11	XX71 1 ·1		Intra-	41 1
2005	jamesii	Native	grass	Unknown	Greenhouse	Desert	Self-Other	Field	Whole soil	Monoculture	1	Aboveground
Bever 1994	Anthoxanthu m odoratum	Native	Perennial	Late	Greenhouse	Grassland	Self-Other	15.0	Inoculum	Monoculture	Intra-	Total biomass
Devel 1994	Anthoxanthu	Ivative	grass Perennial	Late	Greennouse	Orassialiu	Sen-Other	15.0	moculum	Monoculture	Intra-	Total biolilass
Bever 1994	m odoratum	Native	grass	Late	Greenhouse	Grassland	Self-Other	15.0	Inoculum	Monoculture		Total biomass
Bever 1774	Anthoxanthu	ivative	Perennial	Lute	Greennouse	Grassiand	Sen Other	15.0	moeulum	wonoeunture	Intra-	rotar oronnass
Bever 1994	m odoratum	Native	grass	Late	Greenhouse	Grassland	Self-Other	15.0	Inoculum	Monoculture		Total biomass
	Anthoxanthu		Perennial				Self-				Intra-	
Bever 1994	m odoratum	Native	grass	Late	Greenhouse	Grassland	Sterilized	15.0	Inoculum	Monoculture		Total biomass
	Danthonia		Perennial								Întra-	
Bever 1994	spicata	Native	grass	Late	Greenhouse	Grassland	Self-Other	15.0	Inoculum	Monoculture	specific	Total biomass
	Danthonia		Perennial								Intra-	
Bever 1994	spicata	Native	grass	Late	Greenhouse	Grassland	Self-Other	15.0	Inoculum	Monoculture	1	Total biomass
	Danthonia		Perennial	_							Intra-	
Bever 1994	spicata	Native	grass	Late	Greenhouse	Grassland	Self-Other	15.0	Inoculum	Monoculture		Total biomass
D 1004	Danthonia	N T	Perennial	T .	C 1	G 1 1	Self-	15.0	x 1		Intra-	TD + 11
Bever 1994	spicata	Native	grass	Late	Greenhouse	Grassland	Sterilized	15.0	Inoculum	Monoculture	specific	Total biomass
	Panicum		Donomial								Intro	
Bever 1994	sphaerocarp on	Native	Perennial grass	Late	Greenhouse	Grassland	Self-Other	15.0	Inoculum	Monoculture	Intra-	Total biomass
Dever 1774	Panicum	Native	grass	Late	Greenhouse	Orassiand	Self-Other	15.0	moculum	Wonoculture	specific	10tal 01011ass
	sphaerocarp		Perennial								Intra-	
Bever 1994	on	Native	grass	Late	Greenhouse	Grassland	Self-Other	15.0	Inoculum	Monoculture		Total biomass
	Panicum		8								-1	
	sphaerocarp		Perennial								Intra-	
Bever 1994	on	Native	grass	Late	Greenhouse	Grassland	Self-Other	15.0	Inoculum	Monoculture	specific	Total biomass
	Panicum											
	sphaerocarp		Perennial				Self-				Intra-	
Bever 1994	on	Native	grass	Late	Greenhouse	Grassland	Sterilized	15.0	Inoculum	Monoculture	specific	Total biomass
Bezemer <i>et al</i> .	Senecio		Biennial		~ .	~	~			~ .		
2006a	jacobaea	Native	forb	Early	Greenhouse	Grassland	Self-Other	72.0	Inoculum	Community	Alone	Total biomass
Bezemer <i>et al.</i>	Senecio	NT /*	Biennial	F 1	C 1	C 1 1	G 16 O/I	72.0	T 1	C :	Intra-	T (11)
2006a	jacobaea	Native	forb	Early	Greenhouse	Grassland	Self-Other	72.0	Inoculum	Community	specific	Total biomass
Bezemer <i>et al.</i> 2006b	Achillea millefolium	Native	Biennial forb	Middle	Greenhouse	Grassland	Self-Other	24.0	Whole soil	Monoculture	Alone	Total biomass
Bezemer <i>et al.</i>	Agrostis	Ivative	Perennial	windule	Greennouse	Orassianu	Sen-Other	24.0	whole som	Wonoculture	Alone	Total biolilass
2006b	capillaris	Native	grass	Middle	Greenhouse	Grassland	Self-Other	24.0	Whole soil	Monoculture	Alone	Total biomass
Bezemer <i>et al.</i>	Anthoxanthu	1 tuti ve	Perennial	maare	Greennouse	Glubbluild	Sen other	21.0	Where som	monoculture	ritone	rotur oronnuss
2006b	m odoratum	Native	grass	Late	Greenhouse	Grassland	Self-Other	24.0	Whole soil	Monoculture	Alone	Total biomass
Bezemer et al.			Perennial									
2006b	Briza media	Native	grass	Unknown	Greenhouse	Grassland	Self-Other	24.0	Whole soil	Monoculture	Alone	Total biomass
Bezemer et al.	Briza media	Native	Perennial	Unknown	Greenhouse	Grassland	Self-Other	24.0	Whole soil	Monoculture	Alone	Total biomass
Deletion of ut.	D. Internet	1.44170		0	Steelinouse	Grassiana	Sen onier					

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		Biennial									
2006b	radicata	Native	forb	Middle	Greenhouse	Grassland	Self-Other	24.0	Whole soil	Monoculture	Alone	Total biomass
Bezemer et al.	Plantago		Biennial									
2006b	lanceolata	Native	forb	Middle	Greenhouse	Grassland	Self-Other	24.0	Whole soil	Monoculture	Alone	Total biomass
Bezemer et al.	Plantago		Biennial									
2006b	lanceolata	Native	forb	Middle	Greenhouse	Grassland	Self-Other	24.0	Whole soil	Monoculture	Alone	Total biomass
Bezemer <i>et al.</i>	Prunella	NT /*	Biennial	X X 1	G 1	C 1 1	6 16 0 1	24.0	XX /1 1 ·1		. 1	TD + 11
2006b	vulgaris	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	24.0	Whole soil	Monoculture	Alone	Total biomass
Bezemer <i>et al.</i>	Sanguisorba	NT-4	Biennial	T.I	Countration	Constant	Calf Others	24.0	W/h = 1 = = = 1	M	A 1	T-4-11.
2006b Bodelier <i>et al.</i>	minor Dotamogaton	Native	forb Perennial	Unknown	Greenhouse	Grassland	Self-Other Self-	24.0	Whole soil	Monoculture	Alone	Total biomass
2006	Potamogeton pectinatus	Non-native	forb	Unknown	Greenhouse	Wetland	Sterilized	Field	Whole soil	Community	Alone	Total biomass
Bodelier <i>et al.</i>	Potamogeton	Non-native	Perennial	Ulikilowii	Orcennouse	wettallu	Self-	Ficiu	whole som	Community	Alone	10tal 010111ass
2006	pectinatus	Non-native	forb	Unknown	Greenhouse	Wetland	Sterilized	Field	Whole soil	Community	Alone	Total biomass
Bodelier <i>et al.</i>	Potamogeton	i toni native	Perennial	Chikhowh	Greennouse	wettand	Self-	1 Ieiu	whole som	Community	Intra-	10tal biolitass
2006	pectinatus	Non-native	forb	Unknown	Greenhouse	Wetland	Sterilized	Field	Whole soil	Community		Total biomass
Bodelier <i>et al.</i>	Potamogeton	i ton nuive	Perennial	Chikhowh	Greennouse	() ettaile	Self-	Tiela	Whole Joh	Community	Intra-	rotur oronnuss
2006	pectinatus	Non-native	forb	Unknown	Greenhouse	Wetland	Sterilized	Field	Whole soil	Community		Total biomass
Bonanomi and	r									5	1	
Mazzoleni	Holcus		Perennial									
2005	lanatus	Native	grass	Unknown	Greenhouse	Grassland	Self-Other	3.5	Whole soil	Monoculture	Alone	Total biomass
Bonanomi and			-									
Mazzoleni	Holcus		Perennial								Intra-	
2005	lanatus	Native	grass	Unknown	Greenhouse	Grassland	Self-Other	3.5	Whole soil	Monoculture	specific	Total biomass
Bonanomi and												
Mazzoleni	Holcus		Perennial								Inter-	
2005	lanatus	Native	grass	Unknown	Greenhouse	Grassland	Self-Other	3.5	Whole soil	Monoculture	specific	Total biomass
Bonanomi and	** 1		D · 1									
Mazzoleni	Holcus	NT /*	Perennial	T T 1		C 1 1	6.16.04	2.5	33.71 1 1	M L	A 1	T (11)
2005	lanatus	Native	grass	Unknown	Greenhouse	Grassland	Self-Other	3.5	Whole soil	Monoculture	Alone	Total biomass
Bonanomi and			Perennial									
Mazzoleni 2005	Inula viscosa	Native	shrub	Late	Greenhouse	Grassland	Self-Other	3.5	Whole soil	Monoculture	Alone	Total biomass
Bonanomi and	inuia viscosa	Ivalive	SILUO	Late	Oreennouse	Orassianu	Self-Other	5.5	whole som	Monoculture	Alone	Total biomass
Mazzoleni			Perennial								Intra-	
2005	Inula viscosa	Native	shrub	Late	Greenhouse	Grassland	Self-Other	3.5	Whole soil	Monoculture		Total biomass
Bonanomi and	mara viscosa	1 (dti ve	Sindo	Lute	Greennouse	Glubblund	Sen other	5.0	Whole Joh	monoculture	speeme	rotur oronnuss
Mazzoleni			Perennial								Inter-	
2005	Inula viscosa	Native	shrub	Late	Greenhouse	Grassland	Self-Other	3.5	Whole soil	Monoculture		Total biomass
Bonanomi and											1	
Mazzoleni			Perennial									
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
	1 11111/111	1 1011 10	1 cremman	Chkilowii	Greenhouse	Grassianu	Sen Onici	5.5	11010 3011	monoculture	1 110110	10101 010111035

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	Native	Perennial forb	Unknown	Greenhouse	Grassland	Self-Other	3.5	Whole soil	Monoculture	Alone	Total biomass
	Scirpus											
Bonanomi et	holoschoenu		Perennial		~ .	~	~					
<i>al.</i> 2005b	s	Native	grass	Late	Greenhouse	Grassland	Self-Other	Field	Whole soil	Monoculture	Alone	Total biomass
Callaway <i>et al.</i>	Centaurea	N	Biennial	Esular	C	Caracterit	Calf Others	E:-14	T.,	C	A 1	A 1
2004a Callaway <i>et al</i> .	maculosa Centaurea	Non-native	forb Biennial	Early	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone Intra-	Aboveground
2004b	maculosa	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community		Aboveground
Callaway <i>et al.</i>	Centaurea	Non-native	Biennial	Larry	Greenhouse	Orassianu	Sen-Other	Ficiu	moculum	Community	Intra-	Abovegiound
2004b	maculosa	Native	forb	Early	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community		Aboveground
Callaway <i>et al.</i>	Centaurea	i tuti ve	Biennial	Early	Greennouse	Grubblullu	Sen other	Tiela	moculum	community	Intra-	riboveground
2004b	maculosa	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	3.8	Inoculum	Monoculture		Aboveground
Callaway et al.	Centaurea		Biennial	5							Intra-	U
2004b	maculosa	Native	forb	Early	Greenhouse	Grassland	Self-Other	3.8	Inoculum	Monoculture	specific	Aboveground
Callaway et al.	Centaurea		Biennial				Self-				Intra-	
2004b	maculosa	Non-native	forb	Early	Greenhouse	Grassland	Sterilized	Field	Inoculum	Community	1	Aboveground
Callaway et al.	Centaurea		Biennial				Self-				Intra-	
2004b	maculosa	Native	forb	Early	Greenhouse	Grassland	Sterilized	Field	Inoculum	Community	1	Aboveground
Callaway <i>et al.</i>	Centaurea	NT	Biennial	F 1	C 1	C 1 1	Self-	2.0	x 1		Intra-	.1 1
2004b	maculosa	Non-native	forb	Early	Greenhouse	Grassland	Sterilized	3.8	Inoculum	Monoculture	1	Aboveground
Callaway <i>et al.</i> 2004b	Centaurea maculosa	Native	Biennial forb	Esular	Greenhouse	Caracterit	Self- Sterilized	3.8	T.,	M	Intra-	A 1
		Inative	Perennial	Early	Greenhouse	Grassland	Sternized	5.0	Inoculum	Monoculture	specific	Aboveground
Casper and Castelli 2007	Andropogon gerardii	Native	grass	Middle	Field	Grassland	self-other	Field	Whole soil	Community	Alone	Aboveground
Casper and	Andropogon	Native	Perennial	Wildule	Ticid	Orassianu	sen-other	Ficiu	whole som	Community	Inter-	Aboveground
Castelli 2007	gerardii	Native	grass	Middle	Field	Grassland	self-other	Field	Whole soil	Community		Aboveground
Casper and	Schizachvriu	1.000.00	Perennial		11010	orabbianta		11010	in noie boin	Community	speenne	rice vegreana
Castelli 2007	m scoparium	Native	grass	Late	Field	Grassland	self-other	Field	Whole soil	Community	Alone	Aboveground
Casper and	Schizachyriu		Perennial							2	Inter-	C
Castelli 2007	m scoparium	Native	grass	Late	Field	Grassland	self-other	Field	Whole soil	Community	specific	Aboveground
Casper and	Sorghastrum		Perennial									
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 <i>et al.</i>	Agrostis		Perennial		a 1	a 1 1	Self-	T . 11	**** 1 **	~ .	Inter-	Aboveground
2004a	capillaris	Native	grass	Middle	Greenhouse	Grassland	Sterilized	Field	Whole soil	Community	specific	U
De Deyn <i>et al.</i>	Anthoxanthu	Nativa	Perennial	Lata	Creambarra	Creaseland	Self- Sterilized	Eald	Whole soil	Community	Inter-	Aboveground
2004a De Deyn <i>et al</i> .	m odoratum Campanula	Native	grass Perennial	Late	Greenhouse	Grassland	Sternized Self-	Field	Whole soil	Community	specific Inter-	
2004a	rotundifolia	Native	forb	Late	Greenhouse	Grassland	Sterilized	Field	Whole soil	Community	specific	Aboveground
De Deyn <i>et al.</i>	Centaurea	Ivalive	Perennial	Laic	Greenhouse	Jiassianu	Sternized Self-	Ficiu	whole soll	Community	Inter-	
2004a	jacea	Native	forb	Late	Greenhouse	Grassland	Sterilized	Field	Whole soil	Community	specific	Aboveground
	5			Late	Greenhouse		Self-				1	Aboveground
De Deyn <i>et al</i> .	Festuca	Native	Perennial	Late	Greennouse	Grassland	5011-	Field	Whole soil	Community	Inter-	1 100 Controlling

2004a	ovina		grass				Sterilized				specific	
De Deyn et al.	Festuca		Perennial				Self-				Inter-	.1 1
2004a	rubra	Native	grass	Middle	Greenhouse	Grassland	Sterilized	Field	Whole soil	Community	specific	Aboveground
De Deyn et al.	Lolium		Perennial				Self-				Inter-	Aboveground
2004a	perenne	Native	grass	Early	Greenhouse	Grassland	Sterilized	Field	Whole soil	Community	specific	Aboveground
De Deyn <i>et al.</i>	Plantago	NT /*	Perennial	NC 111	C 1	<u> </u>	Self-	F: 11	XX 71 1 1	a :	Inter-	Aboveground
2004a	lanceolata	Native	forb	Middle	Greenhouse	Grassland	Sterilized	Field	Whole soil	Community	specific	U
De Deyn <i>et al.</i> 2004a	Poa trivialis	Native	Perennial grass	Early	Greenhouse	Grassland	Self- Sterilized	Field	Whole soil	Community	Inter- specific	Aboveground
De Deyn <i>et al.</i>	Prunella	Inative	Perennial	Larry	Oreennouse	Orassialiu	Self-	Field	whole som	Community	Inter-	
2004a	vulgaris	Native	forb	Middle	Greenhouse	Grassland	Sterilized	Field	Whole soil	Community	specific	Aboveground
De Deyn <i>et al.</i>	Rumex	1.001.00	Perennial	maare		orassiana	Self-	11010	in noie bon	Community	Inter-	
2004a	obtusifolius	Native	forb	Early	Greenhouse	Grassland	Sterilized	Field	Whole soil	Community	specific	Aboveground
De Deyn et al.	Stellaria		Annual	5			Self-			5	Inter-	A1 1
2004a	media	Native	forb	Early	Greenhouse	Grassland	Sterilized	Field	Whole soil	Community	specific	Aboveground
De Deyn et al.	Succisa		Annual				Self-				Inter-	Aboveground
2004a	pratensis	Native	forb	Early	Greenhouse	Grassland	Sterilized	Field	Whole soil	Community	specific	Aboveground
Ehlers and			~									
Thompson	Bromus	N	Perennial		F: 11	a	0.10.0.1			a	Intra-	Aboveground
2004	erectus	Native	grass	Unknown	Field	Grassland	Self-Other	Field	Whole soil	Community	specific	
Cilloonia and	Erodium		A.m. 1.01									
Gillespie and Allen 2006	macrophyllu m	Native	Annual forb	Early	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone	Aboveground
Alleli 2000	m Erodium	Inative	1010	Larry	Oreennouse	Grassialiu	Self-Other	Field	moculum	Community	Alone	Abovegiouna
Gillespie and	macrophyllu		Annual									
Allen 2006	m	Native	forb	Early	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone	Aboveground
	Erodium			5						5		0
Gillespie and	macrophyllu		Annual				Self-					
Allen 2006	m	Native	forb	Early	Greenhouse	Grassland	Sterilized	Field	Inoculum	Monoculture	Alone	Aboveground
Gustafson and	Andropogon		Perennial									
Casper 2004	gerardii	Native	grass	Middle	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone	Total biomass
Gustafson and	Andropogon	NT	Perennial	N C 1 11	G 1	G 1 1	0.16.0.1	F ² 11	T 1	a	. 1	T (11)
Casper 2004 Gustafson and	gerardii Sohiza ohuwiy	Native	grass Perennial	Middle	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone	Total biomass
Casper 2004	Schizachyriu m scoparium	Native	grass	Late	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone	Total biomass
Gustafson and	Schizachyriu	Ivative	Perennial	Late	Oreennouse	Grassialiu	Sen-Onici	Piciu	moculum	Community	Alone	10tal 010111ass
Casper 2004	m scoparium	Native	grass	Late	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone	Total biomass
Gustafson and	Sorghastrum	1.001.00	Perennial	2000	010011100000	orassiana		11010	motunin	community	1 110110	
Casper 2004	nutans	Native	grass	Late	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone	Total biomass
Gustafson and	Sorghastrum		Perennial							-		
Casper 2004	nutans	Native	grass	Late	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone	Total biomass
Holah and												
Alexander	Andropogon		Perennial									
1999	gerardii	Native	grass	Middle	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone	Height
Holah and	4 1		D 1				0.10					
Alexander 1999	Andropogon gerardii	Native	Perennial	Middle	Greenhouse	Grassland	Self- Sterilized	Field	Inoculum	Community	Alone	Haight
Holah and	gerarati Chamaecrist	inalive	grass	windule	Oreennouse	Orassianu	Sterilized	riela	moculum	Community	Alone	Height
Alexander	a fasciculata		Annual									Number of
1999	Michx.	Native	forb	Early	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Alone	leaves
- / / /		1.441.0	1010	Larry		Stubbland		1 1010		_ 0		100.00

Holah and	Chamaecrist											
Alexander 1999	a fasciculata Michx.	Native	Annual forb	Early	Greenhouse	Grassland	Self- Sterilized	Field	Inoculum	Community	Alone	Number of leaves
Kardol <i>et al.</i> 2006	Early successional community	Native	Commun ity	Early	Greenhouse	Grassland	Self-Other	5.0	Inoculum	Community	Inter- specific	Aboveground
Kardol <i>et al.</i>	Early successional	NT	Commun			~	0.10.0.1		· ·		Inter-	Aboveground
2006	community Early	Native	ity	Early	Greenhouse	Grassland	Self-Other	5.0	Inoculum	Community	specific	
Kardol <i>et al.</i> 2006	successional community Early	Native	Commun ity	Early	Greenhouse	Grassland	Self-Other	Field	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	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	Nativa	Commun	Lata	Greenhouse	Grassland	Self-Other	5.0	Incontract	Community	Inter-	Aboveground
2006 Kardol <i>et al</i> .	community Late successional	Native	ity Commun	Late	Greennouse	Grassland	Sell-Other	5.0	Inoculum	Community	specific Inter-	Aboveground
2006	community Late	Native	ity	Late	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	specific	
Kardol <i>et al.</i> 2006	successional community Mid	Native	Commun ity	Late	Greenhouse	Grassland	Self-Other	Field	Inoculum	Community	Inter- specific	Aboveground
Kardol <i>et al.</i> 2006	successional community Mid	Native	Commun ity	Middle	Greenhouse	Grassland	Self-Other	5.0	Inoculum	Community	Inter- specific	Aboveground
Kardol <i>et al.</i> 2006	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	Alopecurus geniculatus	Native	Perennial grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	Întra- specific	Total biomass
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		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	2							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		~ .	~	~	• •			Intra-	
2007	venti	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific Total biomass	
Kardol <i>et al.</i>	Apera spica-	NT /:	Annual	F 1	C 1	C 1 1	G 16 O/I	2.0	т 1	N L	Intra-	
2007	venti	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific Total biomass	
Kardol <i>et al.</i> 2007	Apera spica-	Nativa	Annual	Early	Greenhouse	Creasiland	Self-Other	2.0	Inoculum	Monoculture	Intra- specific Total biomass	
Kardol <i>et al</i> .	venti	Native	grass Annual	Early	Greenhouse	Grassland	Sen-Other	2.0	moculum	Monoculture	Inter-	
2007	Apera spica- venti	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific Aboveground	
2007	Capsella	ivative	Siuss	Larry	Greennouse	Grassiana	Sen Other	2.0	moeurum	wonoeunture	specific 100veground	
Kardol et al.	bursa-		Annual								Intra- Total biomass	
2007	pastoris	Native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	
	Capsella			5							1	
Kardol et al.	bursa-		Annual								Intra-	
2007	pastoris	Native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific Total biomass	
	Capsella			-							•	
Kardol et al.	bursa-		Annual								Intra-	
2007	pastoris	Native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific Total biomass	
	Capsella										_	
Kardol <i>et al.</i>	bursa-		Annual		~ .	~	~	• •			Intra-	
2007	pastoris	Native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific Total biomass	
IZ 11 / J	Capsella		A 1								T. (
Kardol <i>et al.</i> 2007	bursa- pastoris	Native	Annual forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	Intra- specific Total biomass	
2007	Capsella	INALIVE	1010	Larry	Oreennouse	Orassianu	Self-Offici	2.0	moculum	Wonoculture	specific Total biomass	
Kardol et al.	bursa-		Annual								Intra-	
2007	pastoris	Native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific Total biomass	
	Capsella										-1	
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		Annual	-							Intra- Aboveground	
2007	canadensis	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	
Kardol et al.	Conyza		Annual								Intra-	
2007	canadensis	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific Total biomass	
Kardol <i>et al.</i>	Conyza		Annual		~ .	~	~	• •			Intra-	
2007	canadensis	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific Total biomass	
Kardol <i>et al.</i>	Conyza		Annual	F 1	C 1		G 16 O/I	2.0	т 1	M L	Intra-	
2007 Kardol <i>et al</i> .	canadensis Comuza	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific Total biomass Intra-	
2007	Conyza canadensis	Non-native	Annual forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific Total biomass	
Kardol <i>et al</i> .	Conyza		Annual	Darry	Greenhouse	JIASSIAIIU	Sen-Oniel	2.0	moculum	wionocunule	Intra-	
2007	canadensis	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific Total biomass	
			1010	2011	51001110450	Jussiana		2.0	1100001010111		-r	

Kardol <i>et al.</i>	Convza		Annual								Inter-	
2007	canadensis	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture		Aboveground
Kardol et al.			Annual								Intra-	e
2007	Poa annua	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol et al.			Annual	-							Întra-	
2007	Poa annua	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol et al.			Annual								Intra-	
2007	Poa annua	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	1	Total biomass
Kardol et al.	_		Annual								Intra-	
2007	Poa annua	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	1	Total biomass
Kardol <i>et al.</i>	D	NT /*	Annual	F 1	C 1	C 1 1	6.16.04	2.0	T 1	M L	Intra-	T (11)
2007 Kandal at al	Poa annua	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific Intra-	Total biomass
Kardol <i>et al.</i> 2007	Poa annua	Native	Annual grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture		Total biomass
Kardol <i>et al.</i>	r ou unnuu	Inative	Annual	Larry	Oreennouse	Orassianu	Self-Other	2.0	moculum	Wonoculture	Inter-	10tal 010111ass
2007	Poa annua	Native	grass	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture		Aboveground
Kardol <i>et al</i> .	Viola	itative	Annual	Larry	Greennouse	Grassiana	Sen Other	2.0	moculum	Wonoeunure	Intra-	<u> </u>
2007	arvensis	Native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	specific	Total biomass
Kardol et al.	Viola		Annual	5							Intra-	
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	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 <i>et al</i> .	Viola		Annual		~ .	~	~	• •			Intra-	
2007	arvensis	Native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	1	Total biomass
Kardol <i>et al.</i>	Viola	NT /*	Annual	F 1	C 1	C 1 1	6 16 0/1	2.0	T 1	M L	Intra-	T (11)
2007 Kardol <i>et al.</i>	arvensis Viola	Native	forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	1	Total biomass
2007	Viola arvensis	Native	Annual forb	Early	Greenhouse	Grassland	Self-Other	2.0	Inoculum	Monoculture	Inter-	Aboveground
Klironomos	Achillea	Inative	Perennial	Larry	Oreennouse	Orassianu	Self-Other	2.0	moculum	Wonoculture	specific	Aboveground
2002	millefolium	Native	forb	Middle	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Agrostis	1 (uti ve	Perennial	Wildule	Greennouse	Grubbland	Sen other	5.0	Whole Joh	monoculture	ritone	rotur oronnuss
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	Apocynum		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	N T (*	Perennial	TT 1	G 1	C 1 1	6 16 0 1	5.0	XX /1 1 ·1	N 1.	. 1	m / 11
2002	officinalis	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos 2002	Aster novae-	Native	Perennial forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Z002 Klironomos	angliae Aster	Inative	Perennial	Unknown	Greenhouse	Grassiand	Self-Other	5.0	whole soli	wonoculture	Alone	Total biomass
2002	simplex	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Aster	1 auro	Perennial	Shkhowll	Sicennouse	Siussiand	Sen Ould	5.0		monoculture	7 Hone	10441 010111435
2002	vimineus	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Bromus		Perennial			_	-					-
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			Perennial									
2002	Carex flava	Native	grass	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos 2002	Carex garberi	Native	Perennial grass	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Carex	Native	Perennial	Clikilowii	Greenhouse	Grassianu	Self-Other	5.0	whole som	Wonoculture	Alone	1 otal 010111ass
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	N	Biennial	Ender	Count	Caracterit	Calf Othan	5.0	W/le - 1 1	M	A 1	T-4-11.
2002	vulgatum Chenopodiu	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	т		Biennial									
2002	ambrosioides	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
	Chrysanthem											
121	um		D 1									
Klironomos 2002	leucanthemu m	Non-native	Perennial forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	m Cichorium	Non-native	Biennial	Clikilowii	Greenhouse	Glassialla	Self-Offici	5.0	whole som	Wonoculture	Alone	Total biolinass
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 2002	Circium	Non-native	Biennial forb	Fouls	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Z002 Klironomos	vulgare Convolvulus	Non-native	Perennial	Early	Greennouse	Grassianu	Sen-Other	5.0	whole soli	Wonoculture	Alone	Total biomass
2002	arvensis	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Coronilla		Perennial									
2002	varia	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Dactylis	N	Perennial	T.T., 1	Count	Caracteria	Calf Others	5.0	W/le - 1 1	M	A 1	T-4-11.
2002 Klironomos	glomerata Daucus	Non-native	grass Biennial	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
2002	carota	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Echium		Biennial	5								
2002	vulgare	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
121	Erigeron		D' '1									
Klironomos 2002	philadelphic us	Native	Biennial forb	Early	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	us Erigeron	Native	Biennial	Larry	Greenhouse	Grassianu	Self-Other	5.0	whole som	Wonoculture	Alone	Total biolilass
2002	strigosus	Native	forb	Early	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Fragaria		Perennial									
2002	virginiana	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos 2002	Galium mollugo	Non-native	Perennial forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Galium	Non-native	Perennial	Ulikilowii	Oreennouse	Glassialiu	Self-Offici	5.0	whole som	Wonoculture	Alone	Total biolilass
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 2002	Hieracium	Non-native	Perennial forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
2002	aurantiacum	mon-native	1010	UIIKIIOWII	Oreennouse	Glassiallu	Sen-Other	5.0	whole soll	wonoculture	Atone	i otar oronnass

Vlinenemes	Higherium		Donomial									
Klironomos 2002	Hieracium pilosella	Non-native	Perennial forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Hieracium	i von-native	Perennial	Clikilowii	Greennouse	Grassiand	Sen-Other	5.0	whole som	Wonoculture	Alone	Total biolilass
2002	pratense	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Hypericum		Perennial									
2002	perforatum	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Juncus		Perennial									
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	NT	Biennial		a 1	<u> </u>	0.10.0.1	- 0				m . 11
2002	biennis	Native	forb	Early	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	<i>Oenothera</i>	NT /*	Perennial	TT 1	C 1	C 1 1	6 16 04	5.0	XX71 1 '1		A 1	T (11)
2002 Klironomos	perennis Panicum	Native	forb Perennial	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
2002	lanuginosum	Native	grass	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Phleum	Native	Perennial	UIKIIOWII	Greenhouse	Orassialiu	Self-Other	5.0	whole soli	Wonoculture	Alone	10tal 010111ass
2002	pratense	Non-native	grass	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Plantago	11011 1141110	Perennial	o maro ma		Orabbiand	Sen owner	210	in nore bon	111011000010010	1 110110	
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	NT /*	Perennial	T T 1	C 1	C 1 1	0.10.04	5.0	XX 1 1 1		. 1	T (11)
2002	vulgaris	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos 2002	Ranunculus acris	Non-native	Perennial forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Rudbeckia	Non-native	Biennial	UIKIIOWII	Greennouse	Olassiallu	Self-Offici	5.0	whole soli	Wonoculture	Alone	Total biolilass
2002	serotina	Native	forb	Early	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Satureja	Tutive	Perennial	Larry	Greennouse	Grassland	Sen Other	5.0	whole soli	Wonoeunure	7 Home	Total biolitass
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	NT /*	Perennial	T T 1	C 1	C 1 1	0.10.04	5.0	XX 1 1 1		. 1	T (11)
2002	nemoralis	Native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos 2002	Solidago rugosa	Native	Perennial forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Taraxacum	Ivalive	Perennial	UIKIIOWII	Greennouse	Olassiallu	Self-Offici	5.0	whole soli	Wonocunture	Alone	Total biolilass
2002	officinale	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Tragopogon	1.011 1141170	Biennial	Shanowii	Siconnouse	Stubbiund	Sen outer	2.0		monocunare	1 110110	1 cmi oronnubb
2002	pratensis	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
	*			2								

Klironomos	Trifolium		Biennial									
2002	pratense	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	Veronica	1.000 1000.00	Perennial	Luiij	010011100000	orabbiana		0.0	in more bon		1 110110	
2002	officinalis	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Klironomos	0,01011111115	i ton native	Perennial	e initio () in	01001110400	orabbiana		0.0	in more bon		1 110110	
2002	Vicia cracca	Non-native	forb	Unknown	Greenhouse	Grassland	Self-Other	5.0	Whole soil	Monoculture	Alone	Total biomass
Knevel et al.	Amnophila	i ton native	Perennial	Clikilowii	Greenhouse	Grassiana	Self-	5.0	whole som	Wonoculture	7 tione	1000101011035
2004	arenaria	Native	grass	Early	Greenhouse	Dune grass	Sterilized	Field	Inoculum	Monoculture	Alone	Total biomass
Kulmatiski <i>et</i>	Exotic	Ivative	communi	Larry	Greenhouse	Shrub	Sternized	Tielu	moculum	Wionoculture	Comm	10tal 010111ass
al. 2006	species mix	Non-native	ty	Middle	Field	steppe	Self-Other	Field	Whole soil	Community	unity	Plant cover
Kulmatiski <i>et</i>	Native	Non-native	communi	Wilduic	riciu	Shrub	Sen-Other	riciu	whole som	Community	Comm	
al. 2006	species mix	Native		Late	Field		Self-Other	Field	Whole soil	Community	unity	Plant cover
Kulmatiski,	Balsamorrhi	Inative	ty Perennial	Late	Field	steppe	Sell-Other	rield	whole soli	Community	Comm	Fiant Cover
		Native	forb	Late	Field	Grassland	Self-Other	Field	Whole soil	Community		A h arragemented
unpubl. Data	zae sagittata	Inative		Late	rield	Grassiand	Sen-Other	Fleid	whole som	Community	unity	Aboveground
Kulmatiski,	Bromus	NT C	Annual	F 1	F ' 11		0.10.04	E' 11	XX71 1 '1	c :	Comm	A1 1
unpubl. Data	tectorum	Non-native	grass	Early	Field	Grassland	Self-Other	Field	Whole soil	Community	unity	Aboveground
Kulmatiski,	T	NI-4	Perennial	MC111.	E: 14	Currentered	Calf Other	E: 14	W/h = 1 = = = :1	C	Comm	A 1
unpubl. Data	Lupinus spp.	Native	forb	Middle	Field	Grassland	Self-Other	Field	Whole soil	Community	unity	Aboveground
Kulmatiski,		NT C	Perennial	TT 1	F: 11		0.10.04	E' 11	XX71 1 '1	c :	Comm	A1 1
unpubl. Data	Poa bulbosa	Non-native	grass	Unknown	Field	Grassland	Self-Other	Field	Whole soil	Community	unity	Aboveground
Kulmatiski,	Pseudoroegn	NY	Perennial	T .	77.11	<u> </u>	0.10.0.1	T . 11	****	a .	Comm	
unpubl. Data	eria spicata	Native	grass	Late	Field	Grassland	Self-Other	Field	Whole soil	Community	unity	Aboveground
Kulmatiski,	Sissymbrium		Biennial			~	~			~ .	Comm	
unpubl. Data	loeselii	Non-native	forb	Early	Field	Grassland	Self-Other	Field	Whole soil	Community	unity	Aboveground
Meiman et al.	Centaurea		Biennial									
2006	maculosa	Non-native	forb	Early	Greenhouse	Grassland	Self-Other	Field	Whole soil	Community	Alone	Total biomass
Morris <i>et al.</i>	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	1	Total biomass
	Ageratina		Perennial				Self-				Intra-	
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		Total biomass
	Loilium		Perennial				Self-				Intra-	
Niu et al 2007	perenne	Native	grass	Early	Greenhouse	Forest	Sterilized	Field	Inoculum	Community	specific	Total biomass
	Lollium		Perennial								Intra-	
Niu et al 2007	perenne	Native	grass	Unknown	Greenhouse	Forest	Self-Other	Field	Inoculum	Community	specific	Total biomass
	Medicago		Perennial								Intra-	
Niu et al 2007	sativa	Non-native	forb	Unknown	Greenhouse	Forest	Self-Other	Field	Inoculum	Community	specific	Total biomass
	Medicago		Perennial				Self-				Intra-	
Niu et al 2007	sativa	Non-native	forb	Unknown	Greenhouse	Forest	Sterilized	Field	Inoculum	Community	specific	Total biomass
Packer and	Prunus		Perennial				Self-			-		
Clay 2009	serotina	Native	tree	Unknown	Greenhouse	Forest	Sterilized	Field	Inoculum	Community	Alone	Aboveground
Packer and	Prunus		Perennial				Self-			-		
Clay 2000	serotina	Native	tree	Unknown	Greenhouse	Forest	Sterilized	1.3	Inoculum	Community	Alone	Aboveground
Packer and	Prunus		Perennial				Self-			-		
Clay 2000	serotina	Native	tree	Unknown	Greenhouse	Forest	Sterilized	2.5	Inoculum	Community	Alone	Aboveground
										-		

Packer and Clay 2000	Prunus serotina	Native	Perennial tree	Unknown	Greenhouse	Forest	Self- Sterilized	3.8	Inoculum	Community	Alone	Aboveground
Peltzer 2001	Bouteloua gracilis Bouteloua	Native	Annual 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
<i>et al.</i> 2006 Puerta-Pinero	Quercus ilex	Native	tree Perennial	Unknown	Greenhouse	Forest	Self-Other	Field	Whole soil	Monoculture	Alone	Total biomass
<i>et al.</i> 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
<i>et al.</i> 2006 Puerta-Pinero	Quercus ilex	Native	tree Perennial	Unknown	Greenhouse	Forest	Self-Other	Field	Whole soil	Monoculture	Alone	Total biomass
<i>et al.</i> 2006 Puerta-Pinero	Quercus ilex	Native	tree Perennial	Unknown	Greenhouse	Forest	Self-Other	Field	Whole soil	Monoculture	Alone	Total biomass
<i>et al.</i> 2006 Puerta-Pinero	Quercus ilex	Native	tree Perennial	Unknown	Greenhouse	Forest	Self-Other Self-	Field	Whole soil	Monoculture	Alone	Total biomass
et al. 2006 Reinhart and	Quercus ilex Acer	Native	tree Perennial	Late	Greenhouse	Forest	Sterilized	Field	Whole soil	Monoculture	Alone	Total biomass
Callaway 2004 Reinhart and	negundo Acer	Non-native	tree Perennial	Unknown	Greenhouse	Forest	Self-Other Self-Other	Field Field	Inoculum	Community	Alone	Total biomass
Callaway 2004 Reinhart and Callaway 2004	negundo Acer negundo	Native Non-native	tree Perennial tree	Unknown Unknown	Greenhouse Greenhouse	Forest	Self- Sterilized	Field	Inoculum Inoculum	Community Community	Alone	Total biomass Total biomass
Reinhart and Callaway 2004	Acer negundo	Native	Perennial tree	Unknown	Greenhouse	Forest	Self- Sterilized	Field	Inoculum	Community	Alone	Total biomass
Reinhart and Callaway 2004	Acer platanoides	Non-native	Perennial tree	Unknown	Greenhouse	Forest	Self-Other	Field	Inoculum	Community	Alone	Total biomass
Reinhart and Callaway 2004	Acer platanoides	Non-native	Perennial tree	Unknown	Greenhouse	Forest	Self-Other	Field	Inoculum	Community	Alone	Total biomass
Reinhart and Callaway 2004	Acer platanoides	Native	Perennial tree	Unknown	Greenhouse	Forest	Self-Other	Field	Inoculum	Community	Alone	Total biomass
Reinhart and Callaway 2004	Acer platanoides	Non-native	Perennial tree	Unknown	Greenhouse	Forest	Self- Sterilized	Field	Inoculum	Community	Alone	Total biomass
Reinhart and Callaway 2004	Acer platanoides	Non-native	Perennial tree	Unknown	Greenhouse	Forest	Self- Sterilized	Field	Inoculum	Community	Alone	Total biomass
Reinhart and Callaway 2004	Acer platanoides	Native	Perennial tree	Unknown	Greenhouse	Forest	Self- Sterilized	Field	Inoculum	Community	Alone	Total biomass
Reinhart <i>et al.</i> 2003	Prunus serotina P	Native	Perennial tree	Middle	Greenhouse	Forest	Self-Other	Field	Inoculum	Community	Alone	Aboveground
Reinhart <i>et al.</i> 2003 Reinhart <i>et al.</i>	Prunus serotina Prunus	Native	Perennial tree Perennial	Middle	Greenhouse	Forest	Self-Other	Field	Inoculum	Community	Intra- specific	Aboveground
2003 Reinhart <i>et al.</i>	serotina Prunus	Non-native	tree Perennial	Unknown	Greenhouse	Forest	Self-Other	Field	Inoculum	Community	Alone Intra-	Aboveground
2003 Reinhart <i>et al.</i>	serotina Prunus	Non-native	tree Perennial	Unknown	Greenhouse	Forest	Self-Other Self-	Field	Inoculum	Community	specific	Aboveground
2003	serotina	Non-native	tree	Unknown	Greenhouse	Forest	Sterilized	Field	Inoculum	Community	Alone	Aboveground

Reinhart <i>et al.</i> 2003	Prunus serotina	Non-native	Perennial tree	Unknown	Greenhouse	Forest	Self- Sterilized	Field	Inoculum	Community	Intra- specific	Aboveground
Reinhart et al.	Prunus	1.011 11401.0	Perennial	o mino o m	Ci comine ase	101000	Self-	11010	motunin	community	speenne	rice (egreana
2003	serotina	Native	tree	Unknown	Greenhouse	Forest	Sterilized	Field	Inoculum	Community	Alone	Aboveground
Reinhart et al.	Prunus		Perennial				Self-			2	Intra-	e
2003	serotina	Native	tree	Unknown	Greenhouse	Forest	Sterilized	Field	Inoculum	Community	specific	Aboveground
Reinhart et al.	Prunus		Perennial								Intra-	Seedling
2005a	serotina	Native	tree	Middle	Greenhouse	Forest	Self-Other	Field	Inoculum	Community	specific	survival (%)
Reinhart et al.	Prunus		Perennial				Self-				Intra-	Seedling
2005a	serotina	Native	tree	Unknown	Greenhouse	Forest	Sterilized	Field	Inoculum	Community	specific	survival (%)
Reinhart et al.	Acer		Perennial								Inter-	
2005b	platanoides	Non-native	tree	Middle	Field	Forest	Self-Other	Field	Whole soil	Community	specific	Aboveground
Reinhart et al.	Populus		Perennial								Inter-	
2005b	trihocarpa	Native	tree	Late	Field	Forest	Self-Other	Field	Whole soil	Community	specific	0
Suding et al.	Acomastylis		Perennial								Intra-	Relative
2004	rossii	Native	forb	Late	Field	Alpine	Self-Other	Field	Whole soil	Community	specific	growth
Suding et al.	Acomastylis		Perennial								Inter-	Relative
2004	rossii	Native	forb	Late	Field	Alpine	Self-Other	Field	Whole soil	Community	specific	abundance
Suding et al.	Deschampsia		Perennial								Intra-	Relative
2004	caespitosa	Native	grass	Late	Field	Alpine	Self-Other	Field	Whole soil	Community	specific	growth
Suding et al.	Deschampsia		Perennial								Inter-	Relative
2004	caespitosa	Native	grass	Late	Field	Alpine	Self-Other	Field	Whole soil	Community	specific	abundance
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			_	Self-					
2001	arenaria	Native	grass	Unknown	Greenhouse	Dune grass	Sterilized	Field	Whole soil	Community	Alone	Total biomass
Troelstra et al.	Ammophila		Perennial		~ .	_	Self-			~ .		
2001	arenaria	Native	grass	Unknown	Greenhouse	Dune grass	Sterilized	Field	Whole soil	Community	Alone	Total biomass
Troelstra et al.	Carex	NT	Perennial	T T T	a 1	5	Self-	F: 11	XX 21 1 11	~ .		m 111
2001	arenaria	Native	grass	Unknown	Greenhouse	Dune grass	Sterilized	Field	Whole soil	Community	Alone	Total biomass
Troelstra et al.	Carex .	NT /	Perennial	T T 1	G 1	D	Self-	F: 11	XX /1 1 ·1	G	4.1	T + 11
2001	arenaria	Native	grass	Unknown	Greenhouse	Dune grass	Sterilized	Field	Whole soil	Community	Alone	Total biomass
Van der Putten	Aristida	NT /	Perennial	T .	G 1	G 1 1	Self-	F: 11	T 1		Intra-	.1 1
et al. 2007	meridionalis	Native	grass	Late	Greenhouse	Grassland	Sterilized	Field	Inoculum	Monoculture		Aboveground
Van der Putten et al. 2007	Cenchrus		Annual	Г 1	C 1	C 1 1	Self- Sterilized	Field	T 1	M L	Intra-	A1 1
Van der Putten	biflorus Europastia	Non-native	grass Perennial	Early	Greenhouse	Grassland	Sterifized Self-	Field	Inoculum	Monoculture	Intra-	Aboveground
et al. 2007	Eragrostis	NI-time		T	Constant	Carrala a 1	Sterilized	E: 14	T.,	M		A 1
Van der Stoel	lehmanniana	Native	grass	Late	Greenhouse	Grassland	Sterilized Self-	Field	Inoculum	Monoculture	specific Intra-	Aboveground Relative total
et al. 2002	Ammophila arenaria	Native	Perennial	Early	Greenhouse	Dune grass	Sterilized	Field	Inoculum	Monoculture	specific	biomass
<i>et ut.</i> 2002	urenuriu	Ivalive	grass	Larry	Orecimouse	Dune grass	Sternized	Field	mocurum	wonocunure	specific	010111855

Author	Source	Nc	Ne	Xc	Xe	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

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.

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 et al. 2007	Author	5	5	0.18	0.45	0.07	0.17
Kardol et al. 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 <i>et al</i> . 2007	Author	5	5	1.55	2.25	0.29	0.13
Kardol <i>et al</i> . 2007	Author	5	5	1.55	2.05	0.29	0.15
Kardol <i>et al</i> . 2007	Author	5	5	1.55	1.73	0.29	0.12
Kardol <i>et al</i> . 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 <i>et al</i> . 2007	Author	5	5	1.21	1.52	0.28	0.09
Kardol <i>et al</i> . 2007	Author	5	5	0.68	2.85	0.09	0.34
Kardol <i>et al</i> . 2007	Author	5	5	6.18	6.40	0.74	0.13
Kardol <i>et al</i> . 2007	Author	5	5	1.12	1.31	0.06	0.08
Kardol <i>et al</i> . 2007	Author	5	5	1.12	1.32	0.06	0.10
Kardol <i>et al</i> . 2007	Author	5	5	1.12	1.25	0.06	0.09
Kardol <i>et al</i> . 2007	Author	5	5	1.12	1.19	0.06	0.23
Kardol <i>et al</i> . 2007	Author	5	5	1.12	1.28	0.06	0.04
Kardol <i>et al</i> . 2007	Author	5	5	0.60	0.75	0.05	0.04
Kardol <i>et al</i> . 2007	Author	5	5	7.67	9.08	1.01	0.64
Kardol <i>et al</i> . 2007	Author	5	5	1.24	2.24	0.23	0.71
Kardol <i>et al</i> . 2007	Author	5	5	1.24	2.41	0.23	0.18
Kardol <i>et al</i> . 2007	Author	5	5	1.24	2.27	0.23	0.19
Kardol <i>et al</i> . 2007	Author	5	5	1.24	1.74	0.23	0.12
Kardol <i>et al</i> . 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 <i>et al</i> . 2007	Author	5	5	0.47	1.13	0.12	0.32
Kardol <i>et al</i> . 2007	Author	5	5	0.47	1.19	0.12	0.31
Kardol <i>et al</i> . 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 et al. 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

Klironomos 2002	Author	10	10	3.10	3.60	0.40	0.40
Klironomos 2002	Author	10	10	3.80	3.90	0.60	0.60
Klironomos 2002	Author	10	10	11.80	11.60	2.30	2.00
Klironomos 2002	Author	10	10	9.80	11.20	1.40	1.20
Klironomos 2002	Author	10	10	0.80	1.10	0.70	0.80
Klironomos 2002	Author	10	10	6.50	7.90	0.80	0.70
Klironomos 2002	Author	10	10	3.50	4.70	0.70	0.70
Klironomos 2002	Author	10	10	11.60	12.40	3.50	1.90
Klironomos 2002	Author	10	10	3.40	4.40	0.90	0.60
Klironomos 2002	Author	10	10	3.90	5.30	0.70	0.70
Klironomos 2002	Author	10	10	2.90	3.10	0.80	0.80
Klironomos 2002	Author	10	10	8.90	10.10	2.60	1.80
Klironomos 2002	Author	10	10	4.90	5.60	1.60	1.10
Klironomos 2002	Author	10	10	3.30	3.30	0.90	0.40
Klironomos 2002	Author	10	10	5.20	6.00	0.30	0.70
Klironomos 2002	Author	10	10	8.40	6.70	1.50	1.40
Klironomos 2002	Author	10	10	1.50	2.00	0.60	0.70
Klironomos 2002	Author	10	10	8.20	7.20	0.30	0.40
Klironomos 2002	Author	10	10	2.30	2.70	0.70	0.60
Klironomos 2002	Author	10	10	3.00	4.20	0.60	0.40
Klironomos 2002	Author	10	10	17.00	15.80	3.60	3.50
Klironomos 2002	Author	10	10	9.90	10.30	0.90	1.80
Klironomos 2002	Author	10	10	8.40	8.30	0.50	0.50
Klironomos 2002	Author	10	10	8.30	8.20	0.80	0.90
Klironomos 2002	Author	10	10	8.40	10.60	1.80	0.90
Klironomos 2002	Author	10	10	3.60	4.50	0.50	0.50
Klironomos 2002	Author	10	10	4.20	5.40	0.40	0.70
Klironomos 2002	Author	10	10	4.40	6.30	0.70	0.80
Klironomos 2002	Author	10	10	5.50	5.70	1.30	0.80
Knevel et al. 2004	Figure 2	5	5	3.84	2.64	0.30	0.24
Kulmatiski <i>et al</i> . 2006	Figure 1	40	40	39.00	9.30	18.97	9.49
Kulmatiski et al. 2006	Figure 1	40	40	8.50	6.50	5.06	4.43
Kulmatiski, unpubl. data	Author	240	180	8.78	1.00	16.61	0.00

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 <i>et al.</i> 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