Hans de Kroon

List of Publications by Citations

157 papers	11,227 citations	56 h-index	102 g-index
161 ext. papers	13,291 ext. citations	5.9 avg, IF	6.23 L-index

#	Paper	IF	Citations
157	More than 75 percent decline over 27 years in total flying insect biomass in protected areas. *PLoS ONE*, **2017**, 12, e0185809	3.7	1293
156	Declines in insectivorous birds are associated with high neonicotinoid concentrations. *Nature*, **2014**, 511, 341-3	50.4	534
155	Elasticity: The Relative Contribution of Demographic Parameters to Population Growth Rate. *Ecology*, **1986**, 67, 1427-1431	4.6	525
154	ELASTICITIES: A REVIEW OF METHODS AND MODEL LIMITATIONS. *Ecology*, **2000**, 81, 607-618	4.6	385
153	VEGETATION PATTERN FORMATION IN SEMI-ARID GRAZING SYSTEMS. *Ecology*, **2001**, 82, 50-61	4.6	333
152	A modular concept of phenotypic plasticity in plants. *New Phytologist*, **2005**, 166, 73-82	9.8	308
151	The influence of savanna trees on nutrient, water and light availability and the understorey vegetation. *Plant Ecology*, **2004**, 170, 93-105	1.7	211
150	The evolution of the worldwide leaf economics spectrum. *Trends in Ecology and Evolution*, **2011**, 26, 88-95	10.9	185
149	Biodiversity effects on ecosystem functioning in a 15-year grassland experiment: Patterns, mechanisms, and open questions. *Basic and Applied Ecology*, **2017**, 23, 1-73	3.2	184
148	The compadre Plant Matrix Database: an open online repository for plant demography. *Journal of Ecology*, **2015**, 103, 202-218	6	175
147	Unveiling below-ground species abundance in a biodiversity experiment: a test of vertical niche differentiation among grassland species. *Journal of Ecology*, **2010**, 98, 1117-1127	6	175
146	High Benefits of Clonal Integration in Two Stoloniferous Species, in Response to Heterogeneous Light Environments. *Journal of Ecology*, **1994**, 82, 511	6	169
145	Fast-slow continuum and reproductive strategies structure plant life-history variation worldwide. *Proceedings of the National Academy of Sciences of the United States of America*, **2016**, 113, 230-5	11.5	167
144	Root morphological plasticity and nutrient acquisition of perennial grass species from habitats of different nutrient availability. *Oecologia*, **1998**, 115, 351-358	2.9	155
143	Root responses to nutrients and soil biota: drivers of species coexistence and ecosystem productivity. *Journal of Ecology*, **2012**, 100, 6-15	6	149
142	SOIL NUTRIENT HETEROGENEITY ALTERS COMPETITION BETWEEN TWO PERENNIAL GRASS SPECIES. *Ecology*, **2001**, 82, 2534-2546	4.6	147
141	Canopy studies on ethylene-insensitive tobacco identify ethylene as a novel element in blue light and plant-plant signalling. *Plant Journal*, **2004**, 38, 310-9	6.9	145

140	A modular concept of plant foraging behaviour: the interplay between local responses and systemic control. *Plant, Cell and Environment*, **2009**, 32, 704-12	8.4	143
139	Effects of nutrients and shade on tree-grass interactions in an East African savanna. *Journal of Vegetation Science*, **2001**, 12, 579-588	3.1	135
138	Effects of rooting volume and nutrient availability as an alternative explanation for root self/non-self discrimination. *Journal of Ecology*, **2007**, 95, 241-251	6	134
137	Long-term study of root biomass in a biodiversity experiment reveals shifts in diversity effects over time. *Oikos*, **2014**, 123, 1528-1536	4	126
136	The Future of Complementarity: Disentangling Causes from Consequences. *Trends in Ecology and Evolution*, **2019**, 34, 167-180	10.9	115
135	Ecophysiological determinants of plant performance under flooding: a comparative study of seven plant families. *Journal of Ecology*, **2006**, 94, 1117-1129	6	113
134	Functional traits as predictors of vital rates across the life cycle of tropical trees. *Functional Ecology*, **2016**, 30, 168-180	5.6	110
133	Plasticity in Morphology and Biomass Allocation in Cynodon dactylon, a Grass Species Forming Stolons and Rhizomes. *Oikos*, **1994**, 70, 99	4	109
132	Ecology. How do roots interact?. *Science*, **2007**, 318, 1562-3	33.3	106
131	Projection matrices in population biology. *Trends in Ecology and Evolution*, **1988**, 3, 264-9	10.9	104
130	High levels of inter-ramet water translocation in two rhizomatous Carex species, as quantified by deuterium labelling. *Oecologia*, **1996**, 106, 73-84	2.9	101
129	Large herbivores may alter vegetation structure of semi-arid savannas through soil nutrient mediation. *Oecologia*, **2011**, 165, 1095-107	2.9	100
128	Interactive effects of nutrient heterogeneity and competition: implications for root foraging theory?. *Functional Ecology*, **2012**, 26, 66-73	5.6	99
127	Shade avoidance in Trifolium repens: costs and benefits of plasticity in petiole length and leaf size. *New Phytologist*, **2006**, 172, 655-66	9.8	99
126	International scientists formulate a roadmap for insect conservation and recovery. *Nature Ecology and Evolution*, **2020**, 4, 174-176	12.3	98
125	Contrasting root behaviour in two grass species: a test of functionality in dynamic heterogeneous conditions. *Plant and Soil*, **2011**, 344, 347-360	4.2	93
124	Improving the scale and precision of hypotheses to explain root foraging ability. *Annals of Botany*, **2008**, 101, 1295-301	4.1	93
123	Lost in diversity: the interactions between soil-borne fungi, biodiversity and plant productivity. *New Phytologist*, **2018**, 218, 542-553	9.8	90

122	Independent variations of plant and soil mixtures reveal soil feedback effects on plant community overyielding. *Journal of Ecology*, **2013**, 101, 287-297	6	87
121	Space versus time variation in the population dynamics of three co-occurring perennial herbs. *Journal of Ecology*, **2005**, 93, 681-692	6	87
120	Habitat Exploration through Morphological Plasticity in Two Chalk Grassland Perennials. *Oikos*, **1990**, 59, 39	4	85
119	Root morphological and physiological plasticity of perennial grass species and the exploitation of spatial and temporal heterogeneous nutrient patches. *Plant and Soil*, **1999**, 211, 179-189	4.2	84
118	Loop Analysis: Evaluating Life History Pathways in Population Projection Matrices. *Ecology*, **1994**, 75, 2410	4.6	84
117	Flooding disturbances increase resource availability and productivity but reduce stability in diverse plant communities. *Nature Communications*, **2015**, 6, 6092	17.4	82
116	Local adaptation of the clonal plant Ranunculus reptans to flooding along a small-scale gradient. *Journal of Ecology*, **2004**, 92, 696-706	6	82
115	Water and nutrients alter herbaceous competitive effects on tree seedlings in a semi-arid savanna. *Journal of Ecology*, **2009**, 97, 430-439	6	80
114	Root foraging theory put to the test. *Trends in Ecology and Evolution*, **2006**, 21, 113-6	10.9	79
113	Plant responses to soil heterogeneity and global environmental change. *Journal of Ecology*, **2012**, 100, 1303-1314	6	75
112	Long-term disadvantages of selective root placement: root proliferation and shoot biomass of two perennial grass species in a 2-year experiment. *Journal of Ecology*, **2001**, 89, 711-722	6	73
111	Size Hierarchies of Shoots and Clones in Clonal Herb Monocultures: Do Clonal and Non-Clonal Plants Compete Differently?. *Oikos*, **1992**, 63, 410	4	73
110	The interaction between water and nitrogen translocation in a rhizomatous sedge (Carex flacca). *Oecologia*, **1998**, 116, 38-49	2.9	72
109	Plant species diversity affects infiltration capacity in an experimental grassland through changes in soil properties. *Plant and Soil*, **2015**, 397, 1-16	4.2	67
108	Seasonal Dependent Effects of Flooding on Plant Species Survival and Zonation: a Comparative Study of 10 Terrestrial Grassland Species. *Hydrobiologia*, **2006**, 565, 59-69	2.4	63
107	Effects of biodiversity strengthen over time as ecosystem functioning declines at low and increases at high biodiversity. *Ecosphere*, **2016**, 7, e01619	3.1	60
106	Plant populations track rather than buffer climate fluctuations. *Ecology Letters*, **2010**, 13, 736-43	10	58
105	Testing sustainability by prospective and retrospective demographic analyses: evaluation for palm leaf harvest **2007**, 17, 118-28		58

104	A functional comparison of acclimation to shade and submergence in two terrestrial plant species. *New Phytologist*, **2005**, 167, 197-206	9.8	57
103	Linking root traits and competitive success in grassland species. *Plant and Soil*, **2016**, 407, 39-53	4.2	56
102	Organ Preformation in Mayapple as a Mechanism for Historical Effects on Demography. *Journal of Ecology*, **1997**, 85, 211	6	56
101	On plastic and non-plastic variation in clonal plant morphology and its ecological significance. *Folia Geobotanica Et Phytotaxonomica*, **1994**, 29, 123-138		56
100	Differences in flooding tolerance between species from two wetland habitats with contrasting hydrology: implications for vegetation development in future floodwater retention areas. *Annals of Botany*, **2009**, 103, 341-51	4.1	55
99	Plants are less negatively affected by flooding when growing in species-rich plant communities. *New Phytologist*, **2017**, 213, 645-656	9.8	51
98	Early root overproduction not triggered by nutrients decisive for competitive success belowground. *PLoS ONE*, **2013**, 8, e55805	3.7	51
97	Shoot dynamics of the giant grass Gynerium sagittatum in Peruvian Amazon floodplains, a clonal plant that does show self-thinning. *Oecologia*, **1995**, 101, 124-131	2.9	49
96	Seasonality of hydraulic redistribution by trees to grasses and changes in their water-source use that change tree–grass interactions. *Ecohydrology*, **2016**, 9, 218-228	2.5	48
95	Root plasticity maintains growth of temperate grassland species under pulsed water supply. *Plant and Soil*, **2013**, 369, 377-386	4.2	48
94	Region versus site variation in the population dynamics of three short-lived perennials. *Journal of Ecology*, **2010**, 98, 279-289	6	48
93	Matrix projection models meet variation in the real world. *Journal of Ecology*, **2010**, 98, 250-254	6	47
92	Below-ground complementarity effects in a grassland biodiversity experiment are related to deep-rooting species. *Journal of Ecology*, **2018**, 106, 265-277	6	46
91	The interplay between shifts in biomass allocation and costs of reproduction in four grassland perennials under simulated successional change. *Oecologia*, **2006**, 147, 369-78	2.9	46
90	Spatial heterogeneity of plant-soil feedback affects root interactions and interspecific competition. *New Phytologist*, **2015**, 207, 830-40	9.8	45
89	Demographic effects of extreme weather events on a short-lived calcareous grassland species: stochastic life table response experiments. *Journal of Ecology*, **2010**, 98, 255-267	6	45
88	Impacts of savanna trees on forage quality for a large African herbivore. *Oecologia*, **2008**, 155, 487-96	2.9	45
87	Only seed size matters for germination in different populations of the dimorphic Tragopogon pratensis subsp. pratensis (Asteraceae). *American Journal of Botany*, **2005**, 92, 432-7	2.7	44

86	Soil heterogeneity generated by plant–soil feedbacks has implications for species recruitment and coexistence. *Journal of Ecology*, **2013**, 101, 277-286	6	43
85	Abiotic constraints at the upper boundaries of two Rumex species on a freshwater flooding gradient. *Journal of Ecology*, **2005**, 93, 138-147	6	43
84	Density-dependent growth responses in two clonal herbs: regulation of shoot density. *Oecologia*, **1991**, 86, 298-304	2.9	43
83	Plant species richness and functional groups have different effects on soil water content in a decade-long grassland experiment. *Journal of Ecology*, **2019**, 107, 127-141	6	42
82	Endogenous abscisic acid as a key switch for natural variation in flooding-induced shoot elongation. *Plant Physiology*, **2010**, 154, 969-77	6.6	42
81	Below-ground resource partitioning alone cannot explain the biodiversity–ecosystem function relationship: A field test using multiple tracers. *Journal of Ecology*, **2018**, 106, 2002-2018	6	41
80	A multitrophic perspective on biodiversity-ecosystem functioning research. *Advances in Ecological Research*, **2019**, 61, 1-54	4.6	41
79	Plant diversity shapes microbe-rhizosphere effects on P mobilisation from organic matter in soil. *Ecology Letters*, **2015**, 18, 1356-65	10	41
78	Strict mast fruiting for a tropical dipterocarp tree: a demographic cost–benefit analysis of delayed reproduction and seed predation. *Journal of Ecology*, **2011**, 99, 1033-1044	6	41
77	Fitness consequences of natural variation in flooding-induced shoot elongation in Rumex palustris. *New Phytologist*, **2011**, 190, 409-20	9.8	41
76	Physiologically-Mediated Self/Non-Self Root Discrimination in Trifolium repens has Mixed Effects on Plant Performance. *Plant Signaling and Behavior*, **2006**, 1, 116-21	2.5	41
75	Plasticity as a plastic response: how submergence-induced leaf elongation in Rumex palustris depends on light and nutrient availability in its early life stage. *New Phytologist*, **2012**, 194, 572-582	9.8	39
74	Elasticity Analysis in Population Biology: Methods and Applications1. *Ecology*, **2000**, 81, 605-606	4.6	39
73	Reliability of Elasticity Analysis: Reply to Mills et al.. *Conservation Biology*, **2001**, 15, 278-280	6	39
72	Variation in petiole and internode length affects plant performance in Trifolium repens under opposing selection regimes. *Evolutionary Ecology*, **2008**, 22, 383-397	1.8	38
71	Effects of fine-scale disturbances on the demography and population dynamics of the clonal moss Hylocomium splendens. *Journal of Ecology*, **2001**, 89, 395-405	6	37
70	Density Dependent Simulation of the Population Dynamics of a Perennial Grassland Species, Hypochaeris radicata. *Oikos*, **1987**, 50, 3	4	36
69	Plant species richness negatively affects root decomposition in grasslands. *Journal of Ecology*, **2017**, 105, 209-218	6	35

68	Carnivora population dynamics are as slow and as fast as those of other mammals: implications for their conservation. *PLoS ONE*, **2013**, 8, e70354	3.7	34
67	Resource Allocation Patterns as a Function of Clonal Morphology: A General Model Applied to a Foraging Clonal Plant. *Journal of Ecology*, **1991**, 79, 519	6	34
66	Benefits of flooding-induced aquatic adventitious roots depend on the duration of submergence: linking plant performance to root functioning. *Annals of Botany*, **2017**, 120, 171-180	4.1	33
65	Tree species vary widely in their tolerance for liana infestation: A case study of differential host response to generalist parasites. *Journal of Ecology*, **2018**, 106, 781-794	6	32
64	Competition between Shoots in Stands of Clonal Plants. *Plant Species Biology*, **1993**, 8, 85-94	1.3	32
63	Root responses of grassland species to spatial heterogeneity of plant□oil feedback. *Functional Ecology*, **2015**, 29, 177-186	5.6	31
62	Intraspecific variation in the magnitude and pattern of flooding-induced shoot elongation in Rumex palustris. *Annals of Botany*, **2009**, 104, 1057-67	4.1	30
61	Flexible life history responses to flower and rosette bud removal in three perennial herbs. *Oikos*, **2004**, 105, 159-167	4	30
60	Plant traits alone are poor predictors of ecosystem properties and long-term ecosystem functioning. *Nature Ecology and Evolution*, **2020**, 4, 1602-1611	12.3	30
59	Corrections for rooting volume and plant size reveal negative effects of neighbour presence on root allocation in pea. *Functional Ecology*, **2015**, 29, 1383-1391	5.6	29
58	Reliability of Elasticity Analysis: Reply to Mills et al.. *Conservation Biology*, **2001**, 15, 278-280	6	29
57	Organ Preformation, Development, and Resource Allocation in Perennials **1997**, 113-141		28
56	Diversity effects on root length production and loss in an experimental grassland community. *Functional Ecology*, **2015**, 29, 1560-1568	5.6	27
55	Does disturbance favour weak competitors? Mechanisms of changing plant abundance after flooding. *Journal of Vegetation Science*, **2004**, 15, 305	3.1	27
54	Life cycle stage and water depth affect flooding-induced adventitious root formation in the terrestrial species Solanum dulcamara. *Annals of Botany*, **2015**, 116, 279-90	4.1	25
53	AN EXTENDED FLOWERING AND FRUITING SEASON HAS FEW DEMOGRAPHIC EFFECTS IN A MEDITERRANEAN PERENNIAL HERB. *Ecology*, **2002**, 83, 1991-2004	4.6	25
52	Insect biomass decline scaled to species diversity: General patterns derived from a hoverfly community. *Proceedings of the National Academy of Sciences of the United States of America*, **2021**, 118,	11.5	25
51	Partial Root Drying Effects on Biomass Production in Brassica napus and the Significance of Root Responses. *Plant and Soil*, **2005**, 276, 313-326	4.2	24

50	Scale of nutrient patchiness mediates resource partitioning between trees and grasses in a semi-arid savanna. *Journal of Ecology*, **2011**, 99, 1124-1133	6	23
49	Plant communities in relation to flooding and soil contamination in a lowland Rhine River floodplain. *Environmental Pollution*, **2011**, 159, 182-189	9.3	23
48	Signs of stabilisation and stable coexistence. *Ecology Letters*, **2019**, 22, 1957-1975	10	22
47	Plant-soil feedback is shut down when nutrients come to town. *Plant and Soil*, **2019**, 439, 541-551	4.2	21
46	Effects of cell number and cell size on petiole length variation in a stoloniferous herb. *American Journal of Botany*, **2008**, 95, 41-9	2.7	21
45	Demographic vulnerability of the clonal and endangered meadow thistle. *Plant Ecology*, **2008**, 198, 225-240	2.7	21
44	Limited evidence for spatial resource partitioning across temperate grassland biodiversity experiments. *Ecology*, **2020**, 101, e02905	4.6	20
43	EXPERIMENTAL RAMET AGGREGATION IN THE CLONAL PLANT AGROSTIS STOLONIFERA REDUCES ITS COMPETITIVE ABILITY. *Ecology*, **2005**, 86, 1358-1365	4.6	19
42	Biodiversity increases multitrophic energy use efficiency, flow and storage in grasslands. *Nature Ecology and Evolution*, **2020**, 4, 393-405	12.3	18
41	Combined effects of partial root drying and patchy fertilizer placement on nutrient acquisition and growth of oilseed rape. *Plant and Soil*, **2007**, 295, 207-216	4.2	17
40	Bottlenecks and spatiotemporal variation in the sexual reproduction pathway of perennial meadow plants. *Basic and Applied Ecology*, **2006**, 7, 71-81	3.2	17
39	Moss species benefits from breakdown of cyclic rodent dynamics in boreal forests. *Ecology*, **2007**, 88, 2320-9	4.6	17
38	Surviving in a Cosexual World: A Cost-Benefit Analysis of Dioecy in Tropical Trees. *American Naturalist*, **2017**, 189, 297-314	3.7	16
37	Genotypic selection shapes patterns of within-species diversity in experimental plant populations. *Journal of Ecology*, **2009**, 97, 1020-1027	6	16
36	ELASTICITIES: A REVIEW OF METHODS AND MODEL LIMITATIONS **2000**, 81, 607		16
35	Hydrologically contrasting environments induce genetic but not phenotypic differentiation in Solanum dulcamara. *Journal of Ecology*, **2016**, 104, 1649-1661	6	15
34	Differential responses of germination and seedling establishment in populations of Tragopogon pratensis (Asteraceae). *Plant Biology*, **2007**, 9, 109-15	3.7	15
33	A host–parasite model explains variation in liana infestation among co-occurring tree species. *Journal of Ecology*, **2018**, 106, 2435-2445	6	14

32	Pimpinella saxifraga is maintained in road verges by mosaic management. *Biological Conservation*, **2010**, 143, 899-907	6.2	13
31	Evidence that ethylene signalling is not involved in selective root placement by tobacco plants in response to nutrient-rich soil patches. *New Phytologist*, **2008**, 177, 457-465	9.8	13
30	Scaling up phenotypic plasticity with hierarchical population models. *Evolutionary Ecology*, **2010**, 24, 585-599	1.8	12
29	Depth-based differentiation in nitrogen uptake between graminoids and shrubs in an Arctic tundra plant community. *Journal of Vegetation Science*, **2018**, 29, 34-41	3.1	12
28	Root chemistry and soil fauna, but not soil abiotic conditions explain the effects of plant diversity on root decomposition. *Oecologia*, **2017**, 185, 499-511	2.9	11
27	SOIL NUTRIENT HETEROGENEITY ALTERS COMPETITION BETWEEN TWO PERENNIAL GRASS SPECIES **2001**, 82, 2534		11
26	Effects of extreme rainfall events are independent of plant species richness in an experimental grassland community. *Oecologia*, **2019**, 191, 177-190	2.9	10
25	Root foraging and yield components underlying limited effects of Partial Root-zone Drying on oilseed rape, a crop with an indeterminate growth habit. *Plant and Soil*, **2009**, 323, 163-176	4.2	10
24	On the use of the guild concept in plant ecology. *Folia Geobotanica Et Phytotaxonomica*, **1995**, 30, 519-528		9
23	Above- and belowground overyielding are related at the community and species level in a grassland biodiversity experiment. *Advances in Ecological Research*, **2019**, 61, 55-89	4.6	8
22	Promoting Conceptual Coherence Within Context-Based Biology Education. *Science Education*, **2015**, 99, 958-985	4.3	8
21	VEGETATION PATTERN FORMATION IN SEMI-ARID GRAZING SYSTEMS **2001**, 82, 50		8
20	Predicting species abundances in a grassland biodiversity experiment: Trade-offs between model complexity and generality. *Journal of Ecology*, **2020**, 108, 774-787	6	8
19	Environmental factors constraining adventitious root formation during flooding of Solanum dulcamara. *Functional Plant Biology*, **2017**, 44, 858-866	2.7	7
18	Local soil legacy effects in a multispecies grassland community are underlain by root foraging and soil nutrient availability. *Journal of Ecology*, **2020**, 108, 2243-2255	6	7
17	Overlap in nitrogen sources and redistribution of nitrogen between trees and grasses in a semi-arid savanna. *Oecologia*, **2014**, 174, 1107-16	2.9	7
16	The analysis of plant root responses to nutrient concentration, soil volume and neighbour presence: Different statistical approaches reflect different underlying basic questions. *Functional Ecology*, **2020**, 34, 2210-2217	5.6	6
15	Combining agro-ecological functions in grass-clover mixtures. *AIMS Agriculture and Food*, **2019**, 4, 547-567	1.2	5

14	The macrofauna distribution in brackish inland waters in relation to chlorinity and other factors. *Hydrobiologia*, **1985**, 127, 265-275	2.4	4
13	msGBS: A new high-throughput approach to quantify the relative species abundance in root samples of multispecies plant communities. *Molecular Ecology Resources*, **2021**, 21, 1021-1036	8.4	4
12	Species abundance fluctuations over 31 years are associated with plant–soil feedback in a species-rich mountain meadow. *Journal of Ecology*, **2021**, 109, 1511-1523	6	4
11	Conceptualizing and quantifying body condition using structural equation modelling: A user guide. *Journal of Animal Ecology*, **2021**, 90, 2478-2496	4.7	4
10	Scale-dependent bi-trophic interactions in a semi-arid savanna: how herbivores eliminate benefits of nutrient patchiness to plants. *Oecologia*, **2016**, 181, 1173-85	2.9	3
9	The demographic causes of population change vary across four decades in a long-lived shorebird.. *Ecology*, **2021**, e3615	4.6	3
8	Linking local species coexistence to ecosystem functioning: a conceptual framework from ecological first principles in grassland ecosystems. *Advances in Ecological Research*, **2019**, 61, 265-296	4.6	2
7	Love thy neighbour?–Spatial variation in density dependence of nest survival in relation to predator community. *Diversity and Distributions*,	5	2
6	Acquisition, Use, and Loss of Nutrients **2007**, 259-284		2
5	Hatching failure and accumulation of organic pollutants through the terrestrial food web of a declining songbird in Western Europe. *Science of the Total Environment*, **2019**, 650, 1547-1553	10.2	2
4	Chance, Variation and the Nature of Causality in Ecological Communities. *The Frontiers Collection*, **2016**, 197-214	0.3	1
3	Reply to Redlich et al.: Insect biomass and diversity do correlate, over time. *Proceedings of the National Academy of Sciences of the United States of America*, **2021**, 118,	11.5	1
2	Root morphological and physiological plasticity of perennial grass species and the exploitation of spatial and temporal heterogeneous nutrient patches **1999**, 211, 179		1
1	Carbon accumulation of cool season sports turfgrass species in distinctive soil layers. *Agronomy Journal*, **2020**, 112, 3435-3449	2.2	1