Table 1. Total number of insects collected in pitfall traps for all sampling dates in 1993. Sites 1-9 are sheltered sites, and sites 10-14 are unsheltered sites.

ANC92-012

	Site #													
Family name	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Total spiders	84	303	48	135	153	84	279	249	86	135	269	286	189	131
Thomisidae	2	4	3	5	9	2	5	5	2	4	2	4	5	5
Philodromidae	1	0	0	4	1	0	1	1	21	0	1	1	4	1
Lycosidae	20	212	11	93	119	33	247	208	51	76	219	241	131	80
Carabidae	45	69	69	54	66	51	53	66	1	74	66	149	94	68
Coccinellidae	0	0	0	1	0	0	3	0	1	0	17	1	5	3
Formicidae	299	307	205	438	106	176	307	416	87	218	344	818	185	82
Ichneumonidae	8	4	2	6	24	2	2	5	2	0	1	0	2	1
Braconidae	1	0	0	2	1	1	0	1	0	0	0	0	0	0
Corn rootworms	0	0	0	1	0	1	0	0	0	0	0	1	1	0
Aphids	3	0	4	0	0	2	13	0	0	0	3	76	168	87
Beanleaf beetles	2	2	0	1	0	2	1	6	1	4	0	2	3	9
Larvae	2	11	1	4	5	9	4	3	2	5	1	2	1	0
Grasshoppers	174	64	31	20	77	97	34	44	4	41	88	256	139	189

Table 2. Total number of insects collected in pitfall traps for all sampling dates in 1994. Sites 1-9 are sheltered sites, and sites 10-14 are unsheltered sites.

	Site #													
Family name	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Total spiders	268	186	86	54	335	37	249	284	172	447	121	416	363	193
Thomisidae	6	1	5	2	4	3	1	0	4	2	2	1	4	9
Philodromidae	0	1	0	0	0	0	2	0	0	1	0	2	1	0
Lycosidae	212	117	47	18	303	15	223	238	136	259	82	314	328	149
Carabidae	45	328	129	27	150	21	145	62	64	200	72	133	138	133
Coccinellidae	12	27	2	2	4	2	0	1	4	1	7	0	4	0
Formicidae	308	271	568	175	64	100	235	359	108	151	281	895	124	304
Ichneumonidae	0	1	1	3	1	1	7	1	2	0	2	2	2	0
Braconidae	0	0	0	1	1	0	0	0	0	0	1	0	0	0
Corn rootworms	0	0	0	0	2	1	2	0	1	2	3	0	0	0
Aphids	0	152	1	0	2	3	10	0	4	1	14	2	0	0
Beanleaf beetles	1	0	3	0	0	0	1	1	0	1	0	1	3	1
Larvae	7	15	10	7	5	6	4	3	4	10	3	7	9	10
Grasshoppers	37	57	10	14	128	63	58	67	1	45	95	46	24	63

Table 3. Total number of insects collected by sweeping the vegetation for all sampling dates in 1993. Sites 1-9 are sheltered sites, and sites 10-14 are unsheltered sites.

	Site #													
Family name	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Total spiders	107	72	270	64	135	89	67	103	111	84	63	39	129	28
Thomisidae	5	5	16	4	3	10	10	13	5	6	3	1	18	2
Philodromidae	21	14	70	9	15	21	19	26	31	16	3	5	8	3
Lycosidae	1	0	1	0	0	0	0	1	3	0	0	0	0	0
Coccinellidae	1	3	0	3	0	3	1	2	1	2	4	0	2	3
Formicidae	66	37	95	5	33	55	23	31	56	8	23	9	11	2
Ichneumonidae	22	16	15	23	10	14	7	8	5	3	2	2	3	2
Braconidae	27	18	8	9	6	12	12	8	2	3	2	2	2	0
Corn rootworms	0	1	0	0	0	1	0	6	0	12	0	3	5	13
Aphids	5	24	150	1	3	0	2	21	40	0	0	0	13	0
Beanleaf beetles	6	1	6	7	10	1	3	5	6	12	17	1	10	2
Larvae	14	15	20	12	26	6	16	2	2	9	5	1	3	4
Grasshoppers	89	34	54	16	65	42	10	48	31	67	323	207	65	59

Table 4. Total number of insects collected by sweeping the vegetation for all sampling dates in 1994. Sites 1-9 are sheltered sites, and sites 10-14 are unsheltered sites.

	Site #													
Family name	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Total spiders	61	55	122	54	84	84	54	82	162	81	55	58	79	36
Thomisidae	3	9	5	0	5	21	6	9	6	7	5	6	3	3
Philodromidae	4	8	69	11	22	15	23	20	62	24	5	16	8	12
Lycosidae	0	0	1	1	0	0	0	0	0	0	0	2	0	0
Coccinellidae	6	5	3	5	7	2	1	1	1	9	13	2	5	2
Formicidae	16	22	48	12	6	36	17	65	17	4	10	21	7	1
Ichneumonidae	3	2	2	1	1	6	13	1	4	3	0	2	0	0
Braconidae	0	5	0	2	5	5	2	2	0	1	1	0	0	1
Corn rootworms	5	8	6	3	24	5	41	10	7	24	53	12	9	5
Aphids	0	43	8	1	0	5	24	3	4	5	0	2	1	0
Beanleaf beetles	2	0	1	3	0	2	0	1	17	1	1	5	8	3
Larvae	8	4	5	9	8	22	1	4	14	14	4	5	9	23
Grasshoppers	60	40	62	49	89	133	186	125	49	92	108	50	62	52

Table 5. Total number of insects collected by shaking branches, all 1993 sampling dates included.

	Site #								
Family name	1	2	3	4	5	6	7	8	9
Total spiders	114	137	465	148	202	69	53	173	454
Formicidae	57	36	57	17	22	10	18	6	2
Defoliators	12	7	5	5	4	5	8	7	7

Table 6. Total number of insects collected by shaking branches, all 1994 sampling dates included.

	Site #								
Family name	1	2	3	4	5	6	7	8	9
Total spiders	58	62	184	17	101	83	51	124	315
Formicidae	20	0	5	0	9	4	5	5	1
Defoliators	17	4	3	1	3	6	15	4	0

Table 7. Percent of total number of insects caught in pitfall traps at each of the three sampling dates in 1993.

Family	Spring			Summer			Late summer		
	Deciduous Windbreak	Coniferous Windbreak	Herbaceous Fencerow	Deciduous Windbreak	Coniferous Windbreak	Herbaceous Fencerow	Deciduous Windbreak	Coniferous Windbreak	Herbaceous Fencerow
<u>Predators:</u>									
Spiders	28%	78%	34%	35%	11%	11%	46%	7%	37%
Carabidae	2%	0%	4%	19%	25%	16%	14%	12%	14%
Formicidae	68%	17%	61%	43%	60%	36%	38%	14%	16%
<u>Parasite:</u>									
Ichneumon.	2%	6%	0%	0%	0%	0%	0%	0%	0%
<u>Pests:</u>									
Aphids	0%	0%	0%	1%	0%	40%	1%	2%	0%
Grasshop.	0%	0%	0%	3%	1%	0%	0%	0%	0%

Table 8. Percent of total number of insects caught in pitfall traps at each of the three sampling dates in 1994.

Family	Spring			Summer			Late summer		
	Deciduous Windbreak	Coniferous Windbreak	Herbaceous Fencerow	Deciduous Windbreak	Coniferous Windbreak	Herbaceous Fencerow	Deciduous Windbreak	Coniferous Windbreak	Herbaceous Fencerow
<u>Predators:</u>									
Spiders	51%	63%	42%	12%	11%	14%	46%	42%	61%
Carabidae	8%	5%	15%	24%	48%	17%	17%	13%	16%
Formicidae	36%	26%	32%	40%	35%	62%	22%	40%	15%
<u>Parasite:</u>									
Ichneumon.	0%	0%	2%	0%	0%	0%	0%	0%	0%
<u>Pests:</u>									
Aphids	0%	0%	0%	0%	0%	0%	7%	1%	1%
Grasshop.	1%	0%	0%	21%	3%	6%	5%	1%	6%

Table 9. Percent of total number of insects collected by sweeping the vegetation, for all sampling dates in 1993.

Family	Spring			Summer			Late summer		
	Deciduous Windbreak	Coniferous Windbreak	Herbaceous Fencerow	Deciduous Windbreak	Coniferous Windbreak	Herbaceous Fencerow	Deciduous Windbreak	Coniferous Windbreak	Herbaceous Fencerow
Predators:									
Spiders	39%	89%	62%	27%	31%	18%	56%	33%	24%
Coccinellidae	2%	0%	0%	0%	0%	2%	0%	0%	0%
Formicidae	19%	9%	3%	18%	53%	5%	5%	4%	2%
Parasites:									
Ichneumonidae	13%	2%	3%	3%	1%	0%	3%	0%	0%
Braconidae	19%	0%	8%	1%	2%	0%	1%	1%	0%
Pests:									
Corn rootworms	0%	0%	0%	0%	0%	2%	2%	0%	5%
Aphids	0%	0%	0%	1%	0%	6%	10%	48%	0%
Grasshoppers	0%	0%	0%	7%	12%	67%	43%	9%	3%

Table 10. Percent of total number of insects collected by sweeping the vegetation, for all sampling dates in 1994.

Family	Spring			Summer			Late summer		
	Deciduous Windbreak	Coniferous Windbreak	Herbaceous Fencerow	Deciduous Windbreak	Coniferous Windbreak	Herbaceous Fencerow	Deciduous Windbreak	Coniferous Windbreak	Herbaceous Fencerow
<u>Predators:</u>									
Spiders	94%	95%	100%	19%	43%	26%	30%	42%	18%
Coccinellidae	0%	0%	0%	0%	1%	1%	4%	2%	8%
Formicidae	6%	0%	0%	8%	16%	10%	7%	3%	2%
<u>Parasites:</u>									
Ichneumonidae	0%	0%	0%	1%	1%	0%	3%	1%	1%
Braconidae	0%	0%	0%	1%	0%	0%	2%	0%	0%
<u>Pests:</u>									
Corn rootworms	0%	0%	0%	0%	0%	1%	13%	8%	27%
Aphids	0%	0%	0%	0%	1%	0%	13%	7%	1%
Grasshoppers	0%	0%	0%	68%	26%	39%	18%	2%	32%

Table 11. Mean species richness and abundance in deciduous windbreaks, coniferous windbreaks and herbaceous fencerows during 5 sampling periods, 1993 and 1994 combined.

	Spring	Summer	L. Summer	Fall[a]	Winter
Mean Bird Abundance[b]					
Deciduous Windbreak	5.6A[d]	4.4A	4.7A	3.2A	2.9A
Coniferous Windbreak	4.3A	3.2B	6.5A	14.7B	2.5A
Herbaceous Fencerow	0.8B	1.1C	0.3B	0.3C	0.3B
Mean Species Richness[c]					
Deciduous Windbreak	23.8A	20.1A	15.6A	11.8A	5.2A
Coniferous Windbreak	19.0B	15.5B	10.8B	14.5A	6.8A
Herbaceous Fencerow	6.2C	5.4C	2.4C	1.6B	0.2B

a Means calculated using only 1993 data

b Mean number of birds/100 m edge/census

c Mean number of species observed/site

d Means within a column followed by the same letter are not different at $P \leq 0.10$.

Table 12. Mean species richness and abundance in fields adjacent to field windbreaks or herbaceous fencerows during 5 sampling periods.

	Spring		Summer		L.Summer		Fall[a]	Winter	
	1993	1994	1993	1994	1993	1994	1993	1993	1994
Mean Bird Abundance[b]									
Field Windbreak	2.70	2.10	1.50	1.25	2.85	1.05	0.90	1.56	0.75
Herbaceous Fencerow	2.15	1.32	1.80	1.42	0.64	0.82	0.27	1.61	2.72
P-value	0.47	0.058	0.51	0.52	0.35	0.59	0.41	0.96	0.31
Mean Species Richness[c]									
Field Windbreak	3.03	2.27	2.07	1.97	2.57	1.86	1.40	1.09	0.22
Herbaceous Fencerow	2.63	1.89	2.46	2.16	1.92	1.34	0.20	1.00	1.05
P-value	0.57	0.28	0.46	0.63	0.54	0.29	0.58	0.55	0.79

a Not sampled during 1994

b Mean birds/ 100ha / Census

c Mean number of species/site/census

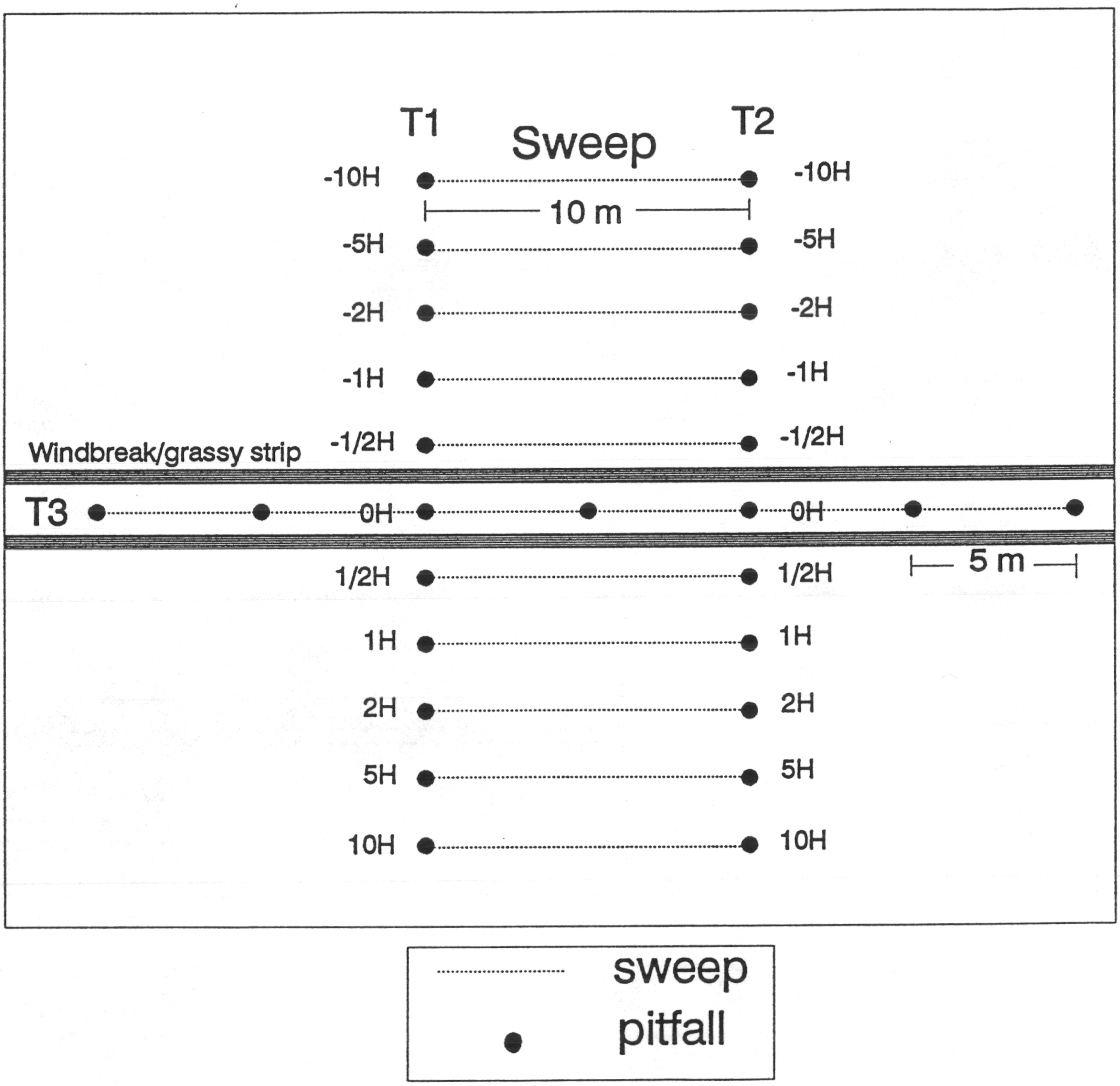
Figure captions:

Figure 1: Typical ACE site.

Figure 2. Total number of chrysomelid beetles captured on sticky traps in exposed and sheltered muskmelon plots during 1992. a) Average weekly precipitation at the University of Nebraska Agriculture Research and Development Center, Mead, Nebraska; b) Total all beetles caught; c) Southern corn rootworm; d) Striped cucumber beetle; e) Northern corn rootworm; f) Western corn rootworm.

Figure 3. Total number of chrysomelid beetles captured on sticky traps in exposed and sheltered muskmelon plots during 1993. a) Average weekly precipitation at the University of Nebraska Agriculture Research and Development Center, Mead, Nebraska; b) Total all beetles caught; c) Southern corn rootworm; d) Striped cucumber beetle; e) Northern corn rootworm; f) Western corn rootworm

Fig. 1.0: Typical site map



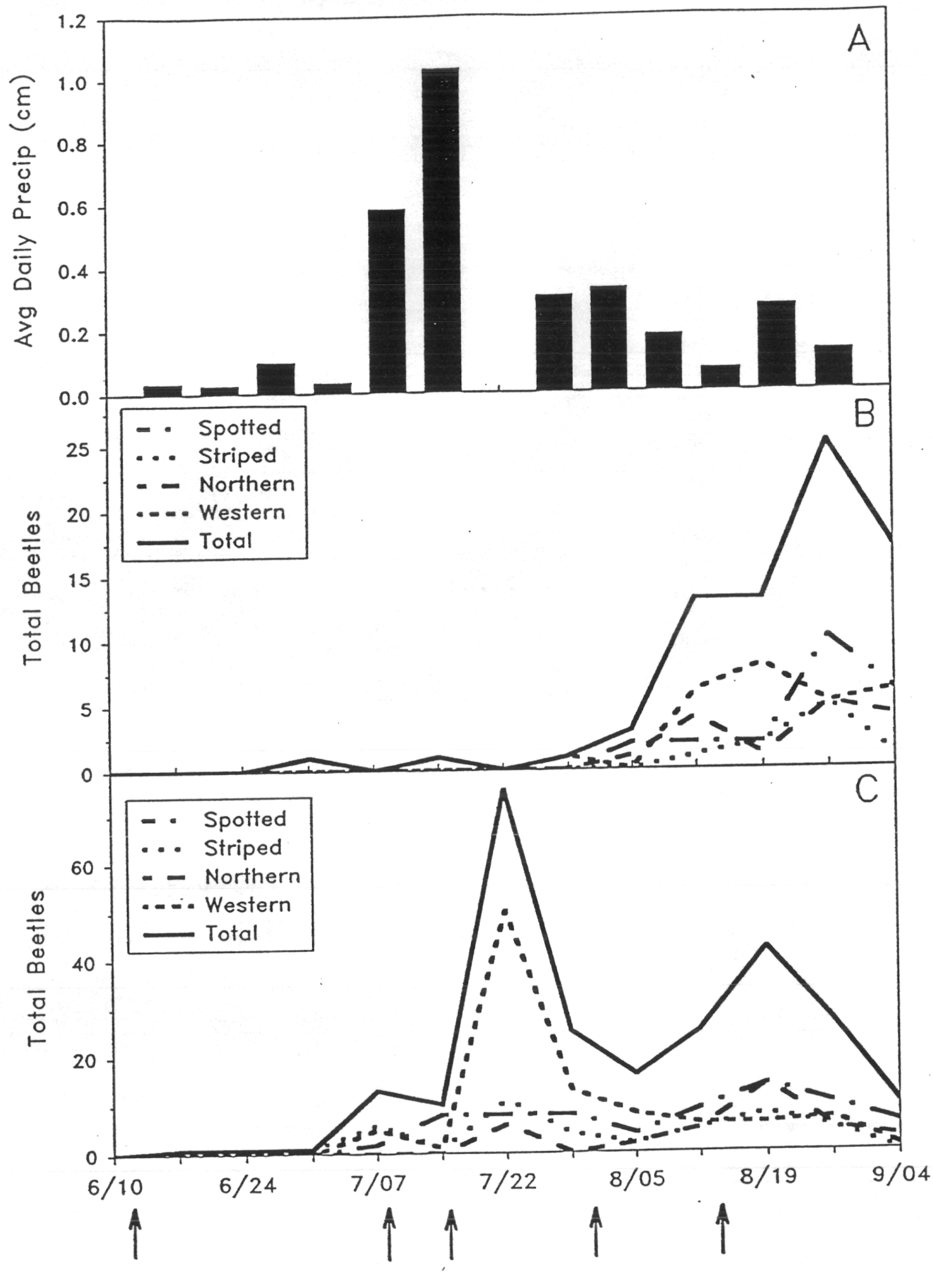


Figure 2. Total number of chrysomelid beetles captured on sticky traps in exposed and sheltered muskmelon plots during 1992. a) Average weekly precipitation at the University of Nebraska Agriculture Research and Development Center, Mead, Nebraska; b) Total all beetles caught; c) Southern corn rootworm; d) Striped cucumber beetle; e) Northern corn rootworm; f) Western corn rootworm.

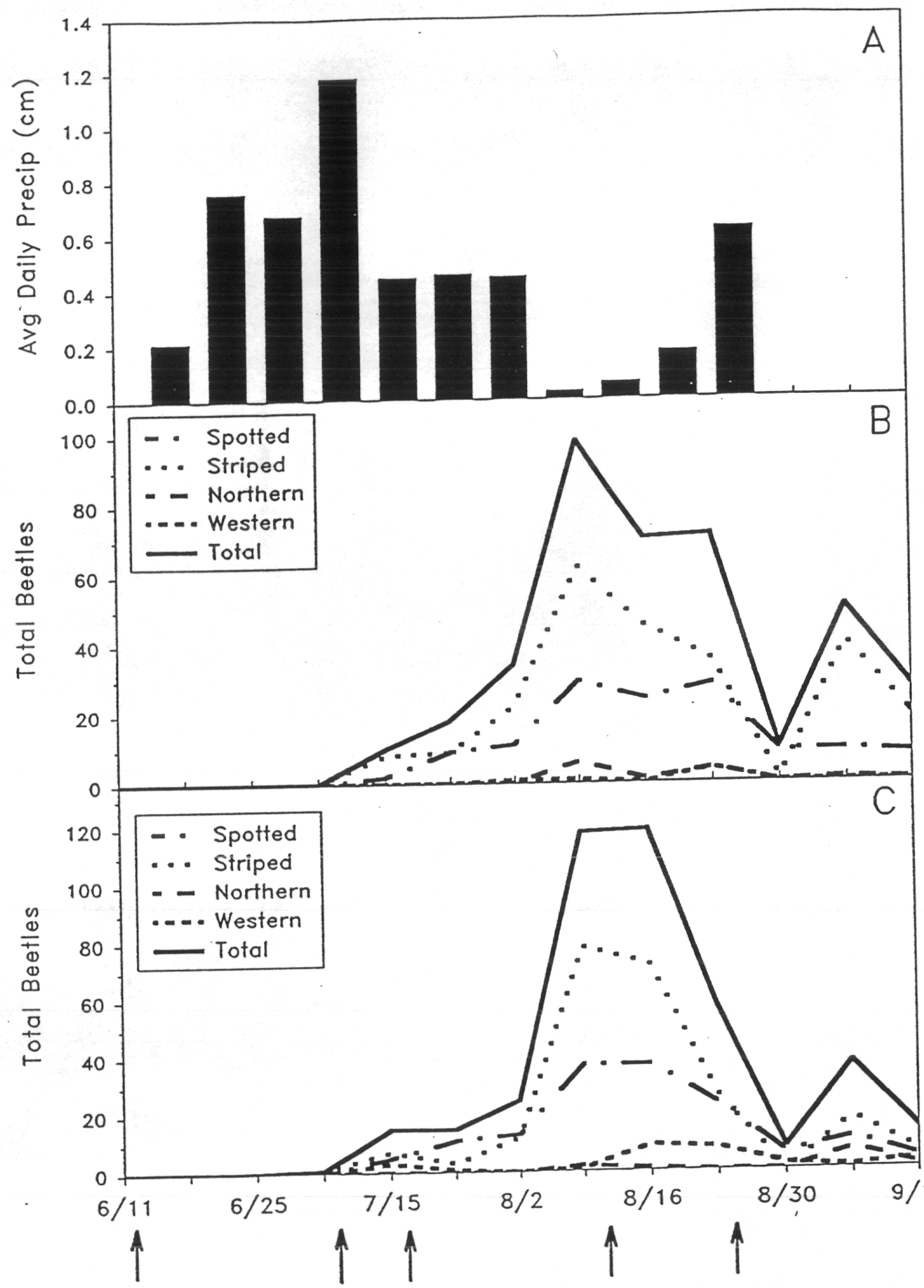


Figure 3. Total number of chrysomelid beetles captured on sticky traps in exposed and sheltered muskmelon plots during 1993. a) Average weekly precipitation at the University of Nebraska Agriculture Research and Development Center, Mead, Nebraska; b) Total all beetles caught; c) Southern corn rootworm; d) Striped cucumber beetle; e) Northern corn rootworm; f) Western corn rootworm.