

A STUDY OF SEED PRODUCTION

IN.

'GRASSLANDS RUANUI' PERENNIAL RYEGRASS (LOLIUM PERENNE L.)

'GRASSLANDS KAHU' TIMOTHY (PHLEUM PRATENSE L.)

AND PRAIRIE GRASS (BROMUS UNIOLOIDES H.B.K.)

(APPENDICES ONLY)

A Thesis Presented in Partial Fulfilment
of the Requirements for the Degree of
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by

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APPENDIX I

DATES OF GRAZING, NITROGEN APPLICATION AND GENERAL MANAGEMENT OF FIELD TRIAL

	<u>Prairie Grass</u>	<u>Perennial Ryegrass</u>	<u>Timothy</u>
Nitrogen	26.5.66	26.5.66	26.5.66
Inter-row cultivation	8.6.66	8.6.66	8.6.66
Nitrogen	14.6.66	14.6.66	14.6.66
Nitrogen	5.7.66	5.7.66	5.7.66
Grazing	2.8.66 (7.6)	3.8.66 (8.6)	3.8.66 (6.8)
Nitrogen	9.8.66	9.8.66	9.8.66
Inter-row cultivation	19.8.66	19.8.66	19.8.66
Weed Control 'Embutox'	20.8.66	20.8.66	20.8.66
Grazing	15.8.66 (7.2)	24.8.66 (9.6)	30.9.66 (11.4)
Nitrogen	5.9.66	5.9.66	5.9.66
Insecticide 'Disyston'	10.10.66	10.10.66	10.10.66
Grazing	26.2.67 (192.0)	26.2.67 (192.0)	-
Inter-row cultivation	6.3.67	6.3.67	-
Potassic superphosphate (all treatments)	6.3.67	6.3.67	-
Nitrogen	6.3.67	6.3.67	-
Nitrogen	16.4.67	16.4.67	16.4.67
Grazing	26.4.67 (48.2)	26.4.67 (48.2)	26.4.67 (48.2)
Potassic superphosphate (all treatments)	-	-	18.4.67
Nitrogen	8.5.67	8.5.67	8.5.67
Inter-row cultivation	8.5.67	8.5.67	8.5.67
Grazing	18.5.67 (100.0)	18.5.67 (100.0)	18.5.67 (100.0)
Grazing	21.6.67 (86.2)	21.6.67 (86.2)	21.6.67 (86.2)
Nitrogen	21.6.67	21.6.67	21.6.67
Grazing	25.7.67 (92.6)	25.7.67 (100.0)	25.7.67 (110.4)
Nitrogen	27.7.67	27.7.67	27.7.67
Inter-row cultivation	6.8.67	6.8.67	6.8.67
Nitrogen	15.8.67	15.8.67	15.8.67
Grazing	-	-	-
Inter-row cultivation	26.9.67	26.9.67	26.9.67
Grazing	-	-	5.10.67 (98.2)
Insecticide 'Disyston'	5.10.67	5.10.67	5.10.67
Nitrogen	-	-	6.10.67
Nitrogen	26.1.68	26.1.68	-
Grazing	23.2.68 (180.0)	23.2.68 (180.0)	-
Nitrogen	23.2.68	23.2.68	-
Nitrogen	9.4.68	9.4.68	9.4.68
Grazing	10.4.68 (121.6)	10.4.68 (121.6)	10.4.68 (121.6)

NOTE: Figures in brackets following grazing dates represent relative measurements of grazing intensity and duration (in sheep-grazing-hours).

MEAN TILLER DENSITIES PER ROW FOOT

RYEGRASS		Treatment			
		+G+N	+G-N	-G+N	-G-N
14.5.66		33.0	33.0	29.4	34.6
30.5.66		37.6	40.8	38.4	39.2
9.6.66		48.6a	53.0a	48.8a	49.0a
20.6.66		72.6a	80.4a	76.0a	74.8a
21.7.66		222.4a	194.2a	226.4a	190.6a
23.8.66	onset initiation	345.0a	307.7a	330.0a	291.3a
20.10.66	boot stage	622.0Bb	543.3Bc	754.0Aa	465.7Cd
27.10.66		505.0	464.3	647.7	461.2
10.11.66	ear emergence	448.5	387.8	624.7	346.2
30.11.66	peak anthesis	438.3Bb	330.8Cc	543.8Aa	358.0Cc
12.12.66	first harvest	354.5	328.0	528.0	361.7
30.12.66	fifth harvest	343.7a	328.2a	349.0a	333.0a
8.2.67		289.8	277.8	331.2	331.3
10.3.67		305.2b	281.8b	349.6a	346.0a
12.4.67		349.5	305.0	459.5	361.2
8.5.67		451.5B	359.5C	667.0A	378.0C
7.6.67		624.8B	429.8D	721.3A	561.0C
7.7.67		756.1	729.2	840.5	857.7
14.8.67		803.5	920.8	943.8	927.2
4.9.67		558.5Cc	706.7Bb	733.8Bb	949.0Aa
4.10.67		495.7	617.7	718.8	835.0
9.11.67	ear emergence	500.2	551.2	637.0	442.0
24.11.67	anthesis	423.7	508.2	358.2	446.5
8.1.68	harvest	175.5Bbc	352.3Aa	142.3Cc	235.7Bb
6.2.68		196.8Cc	447.5Aa	173.8Cb	234.0Bd
14.3.68		388.7	357.0	446.8	333.0
9.4.68		202.3	281.2	356.3	375.0
TIMOTHY		Treatment			
		+G+N	+G-N	-G+N	-G-N
14.5.66		16.0	14.2	18.0	17.2
30.5.66		24.0a	20.8a	20.0a	23.4a
9.6.66		30.0	25.6	26.4	28.6
20.6.66		25.4a	24.2a	21.4a	22.0a
21.7.66		68.2	58.8	62.4	62.6
23.8.66		83.8a	70.0a	66.2a	74.5a
4.10.66		102.6	73.8	117.4	87.6
20.10.66		127.7	71.0	149.5	94.3
27.10.66		137.2	75.3	135.5	107.0
10.11.66	floral initiation	162.0Ab	112.2Bc	205.5Aa	109.8Bc
30.11.66		216.8	164.0	244.0	139.2
12.12.66	boot stage	253.2	211.2	271.8	163.2
30.12.66	ear emergence	242.2Bb	189.2Cc	276.0Aa	168.3Cd
8.2.67	anthesis	249.2Bb	186.8Cc	270.2Aa	157.5Cd
10.3.67	fourth harvest	241.5	187.2	290.2	228.7
12.4.67		254.0	208.3	297.2	238.7
8.5.67		316.3	258.3	355.8	317.0
7.6.67		259.5Bc	232.3Cd	394.2Aa	284.5Bb
7.7.67		420.0	454.5	472.7	464.2
14.8.67		518.5	436.5	487.3	456.5
4.9.67		545.7	436.3	550.8	439.8
4.10.67		307.2D	355.0C	572.7A	426.8B
9.11.67		246.7	359.7	250.7	258.7
24.11.67	ear emergence	168.5D	424.0A	325.3B	266.7C
8.1.68	anthesis	138.8	251.3	143.5	226.2
6.2.68	harvest	182.8	213.5	181.5	166.7
14.3.68		176.8	159.5	163.8	144.7
9.4.68		175.2a	149.7a	148.2a	150.0a

over

APPENDIX 2 CONTINUED

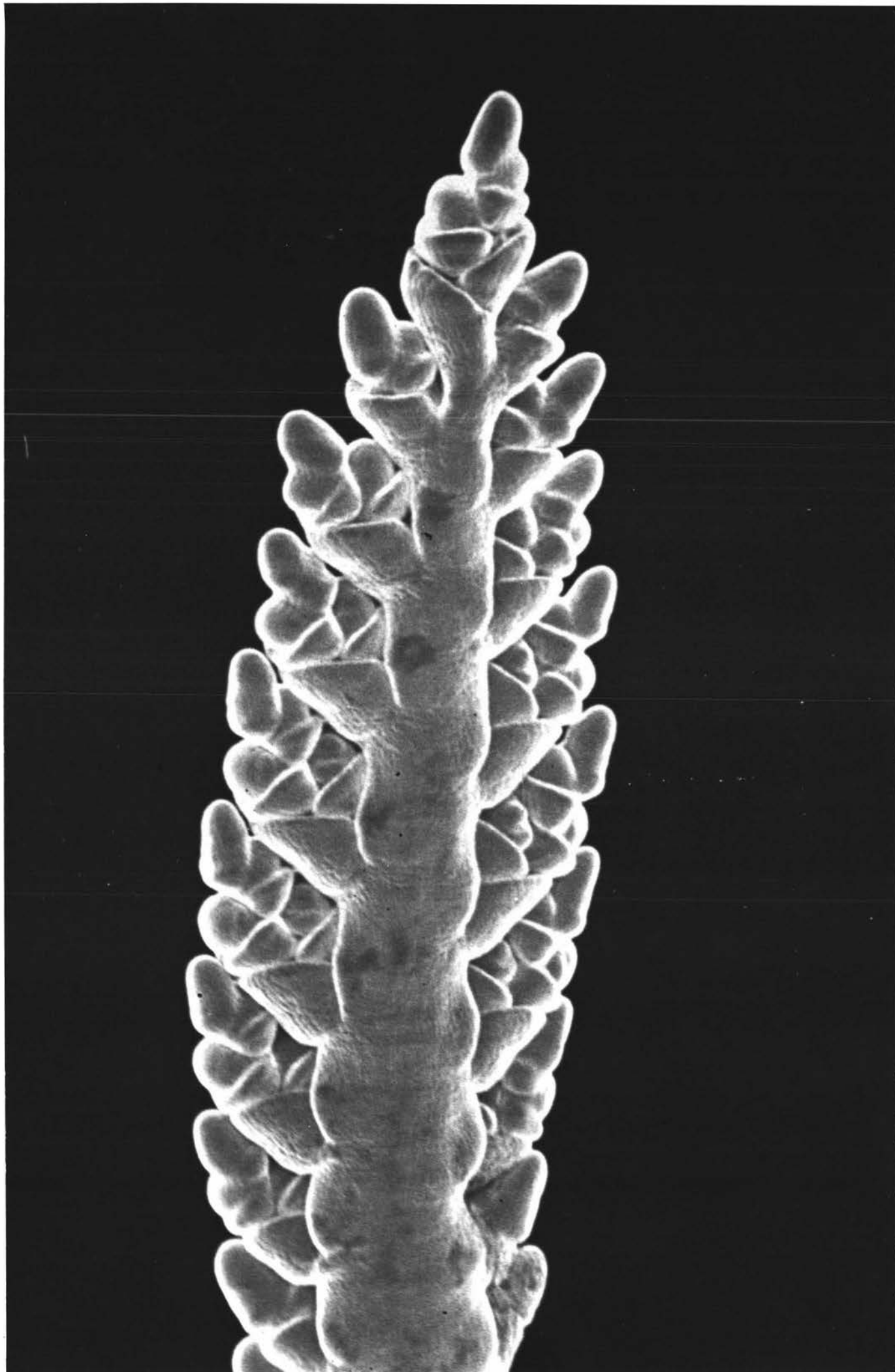
PRAIRIE GRASS		Treatment			
		+G+N	+G-N	-G+N	-G-N
14.5.66		42.4	31.8	41.8	40.3
30.5.66		46.8	39.6	42.4	38.8
9.6.66		48.8	39.4	46.6	41.2
20.6.66		52.2a	41.0a	52.0a	42.6a
21.7.66		66.2	62.5	74.4	56.0
23.8.66	onset initiation	79.3a	71.8a	83.8a	71.7a
15.9.66		88.5	82.0	96.0	80.0
4.10.66		152.2	92.6	130.5	118.6
10.10.66	boot stage	163.3a	119.5b	148.8a	124.2b
20.10.66		161.2	121.7	136.2	121.4
27.10.66	ear emergence	120.5	113.5	127.5	110.0
10.11.66	peak anthesis	118.0	112.7	129.7	109.7
30.11.66	first harvest	122.7	133.5	194.7	141.8
12.12.66	third harvest	124.3D	154.5C	315.5A	199.3B
30.12.66	sixth harvest	118.0Cc	129.8Cc	270.0Aa	186.8Bb
8.2.67		110.0	109.0	126.0	96.5
10.3.67		198.3Aa	161.3Bb	214.3Aa	163.7Bb
12.4.67		193.0	144.3	233.5	168.5
8.5.67		217.8Bb	143.3Ca	257.0Aa	173.5Cc
7.6.67		185.2	117.5	211.3	133.7
7.7.67		182.3	119.5	204.7	156.2
14.8.67		145.3	142.5	184.0	129.3
4.9.67		124.2Bb	147.0Bb	203.7Aa	114.5Bc
4.10.67		200.3Aa	189.8Aa	147.3Bb	93.5Cc
9.11.67	ear emergence	136.0	133.5	183.0	156.0
24.11.67	anthesis	-	-	212.2	246.2
9.12.67		146.5	167.7	176.2	154.3
8.1.68		311.8Aa	173.5Cd	248.5Bb	233.3Bc
6.2.68		213.3	209.3	174.7	228.0
14.3.68		174.2	82.5	142.8	188.2
9.4.68		76.7B	72.3B	143.3A	145.3A

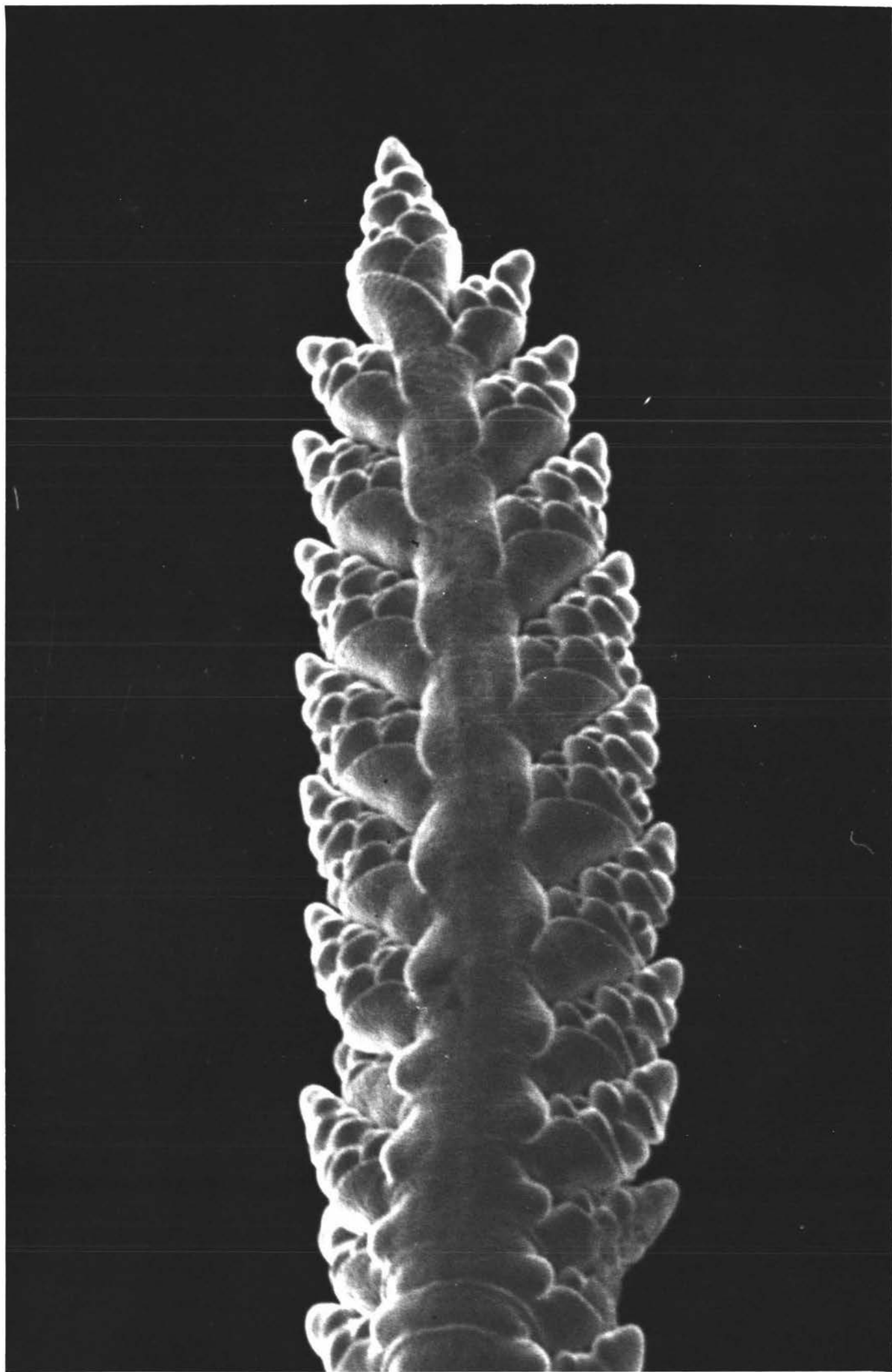
APPENDIX 3

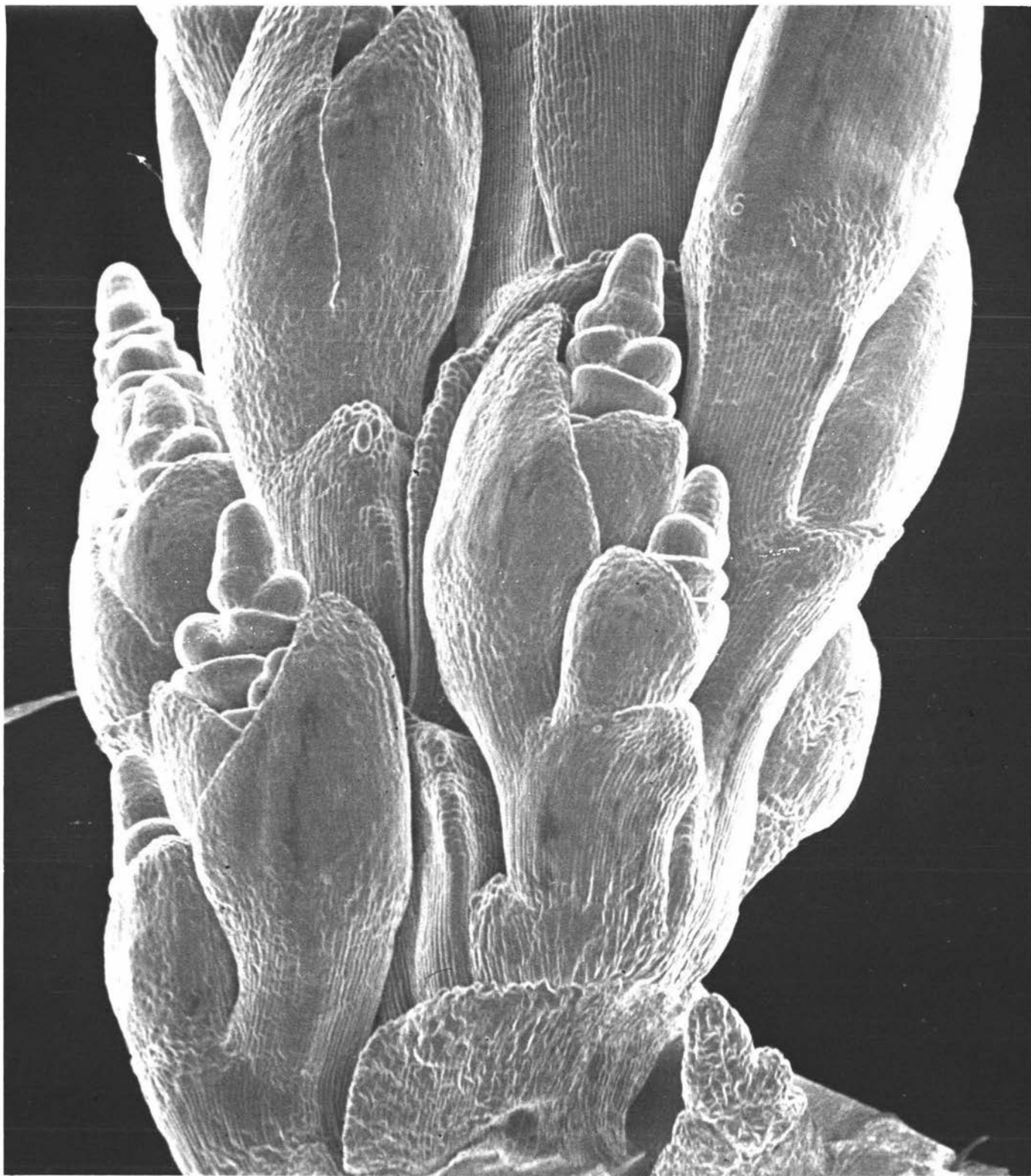
Electron microscope photographs of developing seedheads of perennial ryegrass and prairie grass (see acknowledgements).

KEY (in order)

1. Early stage of floret differentiation - perennial ryegrass (X115).
2. Later stage of floret differentiation - perennial ryegrass (X75).
3. Early stage of basal floret differentiation and panicle branch development - prairie grass (X132).







APPENDIX 4

PERCENTAGE OF REPRODUCTIVE TILLERS OBSERVED
FOLLOWING APICAL DISSECTION, 1966

[illegible]

APPENDIX 4 (Continued)

PERCENTAGE OF REPRODUCTIVE TILLERS OBSERVED
FOLLOWING APICAL DISSECTION, 1966

[illegible]

APPENDIX 4 (Continued)

PERCENTAGE OF REPRODUCTIVE TILLERS OBSERVED
FOLLOWING APICAL DISSECTION, 1966

PRAIRIE GRASS		Date of Observation												
Treatment	Month of Tiller Origin	1/8	5/8	11/8	15/8	22/8	31/8	6/9	13/9	21/9	27/9	6/10	14/10	20/10
+G+N	May	0	0	0	25	65	85	100	100	100	-	-	-	-
	June	0	0	0	30	40	60	75	85	100	100	100	-	-
	July	0	0	0	0	30	40	55	65	70	75	75	-	-
	August	0	0	0	0	0	0	0	10	30	70	70	75	-
	September	0	0	0	0	0	0	0	0	0	0	10	10	15
+G-N	May	0	0	25	60	70	85	85	100	100	100	-	-	-
	June	0	0	0	10	45	60	70	75	65	90	100	100	-
	July	0	0	0	0	10	25	40	55	60	70	85	85	-
	August	0	0	0	0	0	0	0	10	40	40	50	50	65
	September	0	0	0	0	0	0	0	0	0	0	10	0	5
-G+N	May	0	0	5	30	65	95	100	100	-	-	-	-	-
	June	0	0	0	20	50	70	75	100	100	-	-	-	-
	July	0	0	0	5	20	35	50	75	70	80	75	-	-
	August	0	0	0	0	0	0	5	25	45	50	55	60	60
	September	0	0	0	0	0	0	0	0	0	0	0	10	10
-G-N	May	0	0	0	20	55	80	85	100	100	95	-	-	-
	June	0	0	0	10	35	55	65	70	80	100	95	-	-
	July	0	0	0	0	10	20	30	50	60	70	65	-	-
	August	0	0	0	0	0	0	0	0	30	35	35	40	45
	September	0	0	0	0	0	0	0	0	0	0	10	10	10

APPENDIX 5

MEAN MEASUREMENT OF APEX LENGTH AND DISTANCE OF INTERNODAL ELONGATION (mm) (1966)

Month of Tiller Origin	Stage of Develop- ment	Apex Length (mm)				Distance internodal elongation (mm)			
		+G+N	+G-N	-G+N	-G-N	+G+N	+G-N	-G+N	-G-N
PERENNIAL RYEGRASS									
May	a	0.9	1.0	0.8	0.6	8.1	5.0	3.2	10
	b	1.0	1.0	1.0	1.0	33	22	24	22
	c	1.0	2.0	2.0	1.3	47	29	36	21
	d	3.0	2.0	2.0	2.0	54	40	48	38
	e	3.0	3.0	2.9	3.3	99	50	87	58
	f	7.5	6.3	3.8	4.5	102	90	107	86
	g	71	45	111	51	216	154	261	170
	h	231	195	260	160	415	283	423	239
	i	278	237	267	250	585	522	609	544
June	a	0.8	0.8	0.8	0.7	6.2	10	6.2	15
	b	1.0	1.0	1.0	1.0	29	25	45	27
	c	1.0	1.2	2.1	1.0	49	28	33	30
	d	2.0	3.0	2.2	2.0	56	33	139	36
	e	3.0	4.0	3.0	3.0	80	82	95	41
	f	6.5	7.0	4.6	5.0	96	106	118	98
	g	66	44	65	64	211	165	231	162
	h	132	189	224	151	383	203	434	255
	i	224	217	260	231	576	506	646	517
July	a	0.8	0.9	0.9	0.6	7.2	7.1	3.1	16.3
	b	1.0	1.0	1.0	1.0	36	19	42	30
	c	1.1	1.6	1.5	1.7	47	31	79	28
	d	2.0	3.0	2.0	2.5	71	69	132	56
	e	3.0	4.0	3.0	3.1	109	83	136	59
	f	7.0	5.5	7.0	6.5	157	90	145	98
	g	34	36	33	58	199	149	207	180
	h	176	191	197	189	303	251	364	285
	i	193	206	263	226	537	473	586	527
August	a	0.9	1.0	1.0	0.5	6.1	2.0	6.0	16
	b	1.0	1.0	2.0	1.0	42	19	34	27
	c	2.0	1.0	2.0	1.7	41	49	78	30
	d	2.0	2.0	3.0	3.0	94	47	126	33
	e	3.0	3.0	3.0	2.8	104	59	117	64
	f	5.0	10	6.0	6.0	130	86	125	75
	g	26	27	34	27	212	110	201	130
	h	65	150	167	175	252	162	370	269
	i	176	211	249	212	462	426	513	453
September	a	0.9	0.7	0.9	0.7	7.1	8.8	4.0	12
	b	1.0	1.0	0.9	2.0	33	24	36	26
	c	1.0	0.9	1.5	2.0	48	25	38	31
	d	2.5	2.0	2.0	3.0	60	40	56	34
	e	8.0	3.0	3.0	3.0	122	73	99	78
	f	11	7.0	6.0	5.0	162	87	115	77
	g	39	12	92	24	228	92	301	150
	h	77	87	161	170	261	159	321	247
	i	152	141	237	200	456	384	483	431

over

APPENDIX 5 (Cont'd)

MEAN MEASUREMENT OF APEX LENGTH AND DISTANCE OF
INTERNODAL ELONGATION (mm) (1966)

Month of Origin TIMOTHY	Stage	Apex length (mm)				Distance internodal elongation			
		+G+N	+G-N	-G+N	-G-N	+G+N	+G-N	-G+N	-G-N
May	a	1.0	1.0	0.8	1.1	17	12	7.2	11
	b	0.7	0.8	2.0	1.3	55	13	29	26
	c	1.3	1.5	2.0	2.0	42	26	49	41
	d	2.2	3.2	2.7	3.2	72	55	56	59
	e	4.5	5.8	3.4	5.2	194	132	162	147
	f	4.7	7.3	3.9	6.8	208	178	202	186
	g	102	66	108	93	671	247	564	463
	h	137	113	141	133	693	341	766	718
	i	146	124	153	158	797	638	863	814
June	a	1.0	0.9	0.9	0.8	15	11	22	16
	b	1.2	2.2	1.2	1.0	17	12	33	31
	c	1.4	1.8	1.2	1.3	43	31	41	59
	d	2.5	1.7	2.6	1.9	94	39	65	58
	e	4.3	3.0	3.4	3.5	174	98	181	170
	f	10	5.0	12	6.0	247	137	387	261
	g	87	23	106	26	462	280	493	416
	h	101	81	130	124	674	362	690	663
	i	136	121	142	167	718	602	774	724
July	a	0.8	0.5	0.9	0.7	11	6.5	13	13
	b	1.0	0.9	1.0	1.0	22	21	21	21
	c	1.0	0.8	1.0	1.0	37	19	7	56
	d	2.2	3.0	2.8	2.2	61	71	57	79
	e	5.0	4.7	2.7	3.0	183	96	152	104
	f	8.0	8.0	11	7.0	337	226	364	247
	g	26	9.0	31	24	436	245	470	384
	h	61	53	73	67	636	382	526	614
	i	108	92.	130	107	693	517	738	672
August	a	0.5	0.7	0.8	0.6	12	7.8	24	13
	b	1.0	0.5	1.1	1.0	42	11	19	15
	c	1.7	1.3	1.5	1.2	39	30	71	34
	d	3.0	1.8	1.7	2.0	89	46	92	49
	e	3.3	2.0	2.0	3.0	161	109	160	123
	f	7.0	5.0	7.0	6.0	302	197	324	193
	g	21	13	38	19	406	261	431	319
	h	56	38	81	69	610	297	587	561
	i	86	79	124	103	642	386	677	633
September	a	0.8	0.4	0.8	1.0	5.7	4.7	21	9.0
	b	1.0	1.0	1.0	1.0	6.8	5.2	16	18
	c	1.3	1.2	1.3	1.2	31	11	56	37
	d	2.9	3.6	2.6	2.0	73	31	64	48
	e	4.4	4.1	4.8	3.8	109	110	123	93
	f	10	4.0	13	5.0	258	185	381	193
	g	24	16	29	13	361	201	388	278
	h	57	40	60	56	402	236	472	417
	i	81	63	77	76	537	407	636	574

over

APPENDIX 5 (Cont'd)

MEAN MEASUREMENT OF APEX LENGTH AND DISTANCE OF
INTERNODAL ELONGATION (mm) (1966)

Month of Origin	Stage	Apex length (mm)				Distance internodal elongation			
		+G+N	+G-N	-G+N	-G-N	+G+N	+G-N	-G+N	-G-N
PRAIRIE GRASS									
May	a	0.7	0.7	0.9	0.5	3.3	2.3	2.6	2.5
	b	0.9	1.0	1.1	0.8	3.1	4.0	3.4	4.2
	c	1.0	3.0	2.2	1.0	4.0	2.0	4.3	4.5
	d	3.0	3.1	2.6	1.0	6.0	2.9	6.9	5.0
	e	6.0	4.6	2.5	3.0	15	3.4	16	6.0
	f	9.0	8.0	6.3	5.0	58	47	82	31
	g	76	49	74	65	105	79	194	176
	h	204	155	235	228	198	145	395	325
	i	302	271	297	340	392	255	477	381
June	a	0.7	0.7	0.7	0.7	1.3	1.3	2.3	2.3
	b	0.9	1.0	1.0	1.0	4.1	4.0	3.0	2.0
	c	1.0	2.0	1.0	1.0	5.0	2.0	5.0	3.2
	d	1.8	1.8	2.0	1.0	6.7	2.2	7.0	6.5
	e	2.0	8.0	2.0	4.0	13	7.0	18	15
	f	6.5	7.0	3.0	5.6	39	17	37	82
	g	45	39	63	63	78	103	268	176
	h	195	153	188	222	204	187	433	250
	i	212	182	265	331	356	332	518	393
July	a	0.8	0.3	0.6	0.8	2.2	1.7	1.4	1.2
	b	1.0	1.0	1.0	1.0	3.0	3.0	3.0	3.0
	c	1.0	2.0	1.0	2.0	4.0	2.0	4.0	5.0
	d	2.0	3.3	1.0	2.0	5.0	4.7	9.0	12.0
	e	2.0	5.5	1.0	2.5	9.0	15	33	20
	f	4.0	7.0	4.0	8.3	18	29	48	57
	g	29	28	60	46	73	85	264	126
	h	151	141	113	114	142	192	470	237
	i	217	177	207	208	274	296	455	405
August	a	0.7	0.4	0.6	0.7	2.3	0.5	1.5	1.3
	b	0.9	1.0	0.6	0.8	3.1	3.0	4.4	2.9
	c	1.0	0.8	0.9	1.0	5.0	3.1	4.4	7.0
	d	2.0	1.7	1.0	1.6	5.0	4.3	16	8.4
	e	2.0	6.0	1.2	5.0	15	11	29	13
	f	4.0	7.0	3.0	5.5	13	14	37	73
	g	20	20	33	11	29	67	198	128
	h	87	147	223	174	90	189	316	267
	i	200	183	231	262	219	276	386	435
September	a	0.6	0.5	0.5	0.7	2.4	2.0	1.5	1.6
	b	0.8	1.0	1.0	1.0	2.2	2.3	3.0	3.0
	c	1.0	1.0	1.0	1.7	3.5	3.0	4.0	4.3
	d	1.0	1.5	2.0	2.0	5.0	4.5	26	5.0
	e	3.0	2.0	2.1	4.0	5.0	14	28	8.0
	f	2.0	5.6	5.0	5.3	14	36	28	77
	g	19	22	30	13	27	67	157	85
	h	42	123	206	127	106	189	217	229
	i	126	162	237	251	211	298	371	461

APPENDIX 6 PERCENTAGE DISTRIBUTION OF HEADS
PRODUCED IN EACH EMERGENCE GROUP
ACCORDING TO MONTH OF TILLER
ORIGIN (1966)

Emergence Group		Month of tiller origin							
		May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
PERENNIAL RYEGRASS									
+G+N	E1	61.7	37.3	18.9	0.8	0.0	0.0	0.0	0.0
	E2	33.8	56.2	26.6	13.3	0.0	0.0	0.0	0.0
	E3	4.5	4.7	48.3	40.6	50.0	0.0	0.0	0.0
	E4	0.0	1.8	6.2	45.3	50.0	0.0	0.0	0.0
+G-N	E1	60.1	23.7	3.8	1.7	0.0	0.0	0.0	0.0
	E2	33.3	59.3	31.7	7.6	0.0	0.0	0.0	0.0
	E3	6.6	10.8	46.2	37.4	0.0	0.0	0.0	0.0
	E4	0.0	6.2	18.3	53.3	100.0	100.0	0.0	0.0
-G+N	E1	57.6	33.3	11.8	0.0	0.0	0.0	0.0	0.0
	E2	39.1	60.1	31.4	17.9	0.0	0.0	0.0	0.0
	E3	3.3	3.6	47.2	42.4	0.0	0.0	0.0	0.0
	E4	0.0	3.0	9.6	39.7	100.0	100.0	0.0	0.0
-G-N	E1	63.6	19.1	7.4	0.0	0.0	0.0	0.0	0.0
	E2	28.4	58.4	40.9	6.8	0.0	0.0	0.0	0.0
	E3	8.0	22.1	28.0	30.7	0.0	0.0	0.0	0.0
	E4	0.0	0.4	23.7	62.5	100.0	0.0	0.0	0.0
		E1 16-11 to 4-12-66				E2 5-12 to 21-12-66			
		E3 22-12 to 4-1-67				E4 5-1 to 20-1-67			
TIMOTHY									
+G+N	E1	36.0	31.7	20.6	0.0	0.0	0.0	0.0	0.0
	E2	46.6	38.4	18.8	8.4	3.2	0.0	0.0	0.0
	E3	17.4	23.7	46.3	39.3	51.6	53.7	60.0	0.0
	E4	0.0	6.2	14.3	52.3	48.4	46.3	40.0	0.0
+G-N	E1	41.3	28.4	11.0	0.0	0.0	0.0	0.0	0.0
	E2	50.2	41.0	26.3	11.8	0.0	0.0	0.0	0.0
	E3	8.5	22.4	51.2	41.6	37.5	27.1	0.0	0.0
	E4	0.0	8.2	11.5	46.6	62.5	72.9	100.0	0.0
-G+N	E1	30.4	20.3	21.7	0.0	0.0	0.0	0.0	0.0
	E2	41.0	47.6	26.4	17.6	3.4	5.0	0.0	0.0
	E3	28.0	19.7	35.2	47.2	42.9	40.0	0.0	0.0
	E4	0.6	12.4	16.7	35.2	57.1	55.0	100.0	0.0
-G-N	E1	51.7	25.1	3.6	0.0	0.0	0.0	0.0	0.0
	E2	36.9	43.7	31.4	16.4	0.0	10.0	0.0	0.0
	E3	11.4	27.2	57.2	43.7	47.4	30.0	10.0	0.0
	E4	0.0	4.0	7.8	39.9	52.6	60.0	90.0	0.0
		E1 21-12 to 4-1-67				E2 5-1 to 20-1-67			
		E3 21-1 to 5-2-67				E4 6-2 to 20-2-67			

over

PERCENTAGE DISTRIBUTION OF HEADS
PRODUCED IN EACH EMERGENCE GROUP
ACCORDING TO MONTH OF TILLER
ORIGIN (1966)

Emergence Group		Month of tiller origin							
PRAIRIE GRASS		May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
+G+N	E1	78.3	67.3	26.4	0.0	0.0	0.0	0.0	0.0
	E2	20.1	23.1	51.7	20.6	0.0	0.0	0.0	0.0
	E3	1.6	9.6	11.9	30.1	25.0	0.0	0.0	0.0
	E4	0.0	0.0	10.0	49.3	75.0	0.0	0.0	0.0
+G-N	E1	57.6	29.2	7.4	0.0	0.0	0.0	0.0	0.0
	E2	36.8	49.7	37.4	8.3	0.0	0.0	0.0	0.0
	E3	5.6	20.1	35.9	29.1	0.0	0.0	0.0	0.0
	E4	0.0	1.0	19.3	62.6	100.0	0.0	0.0	0.0
-G+N	E1	71.4	61.3	20.6	0.0	0.0	0.0	0.0	0.0
	E2	24.6	26.2	49.7	17.2	0.0	0.0	0.0	0.0
	E3	4.0	12.5	29.7	36.4	10.0	0.0	0.0	0.0
	E4	0.0	0.0	0.0	46.4	90.0	0.0	0.0	0.0
-G-N	E1	72.4	31.6	8.5	0.0	0.0	0.0	0.0	0.0
	E2	26.8	53.7	34.6	11.6	0.0	0.0	0.0	0.0
	E3	1.8	14.7	40.2	30.7	0.0	0.0	0.0	0.0
	E4	0.0	0.0	16.7	57.7	100.0	0.0	0.0	0.0

E1 1511 to 112-66 E2 2-12 to 1612-66
 E3 17-12 to 3112-66 E4 1-1 to 14-1-67

APPENDIX 6

PERCENTAGE DISTRIBUTION OF HEADS PRODUCED IN EACH
EMERGENCE GROUP ACCORDING TO MONTH OF TILLER
ORIGIN (1967)

PERENNIAL RYEGRASS		Month of Tiller Origin										
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
+G+N	E1	48.7	44.4	63.2	16.8	14.2	3.7	0.0	0.0	0.0	0.0	0.0
	E2	34.3	36.7	26.7	24.3	28.9	12.5	12.8	0.0	0.0	0.0	0.0
	E3	17.0	18.9	5.9	38.9	44.2	51.6	20.6	25.0	0.0	0.0	0.0
	E4	0.0	0.0	4.2	20.0	12.7	32.2	66.6	75.0	0.0	0.0	0.0
+G-N	E1	57.3	32.5	36.7	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	E2	40.0	56.0	41.5	50.6	30.0	0.0	20.0	0.0	0.0	0.0	0.0
	E3	2.7	11.5	11.4	18.2	20.0	25.0	30.0	0.0	0.0	0.0	0.0
	E4	0.0	0.0	10.4	25.0	50.0	75.0	70.0	0.0	0.0	0.0	0.0
-G+N	E1	50.5	52.0	58.4	22.2	10.7	2.0	0.0	0.0	0.0	0.0	0.0
	E2	38.1	45.0	31.6	40.7	32.4	16.5	4.8	0.0	0.0	0.0	0.0
	E3	11.4	3.0	8.2	22.1	45.4	55.8	25.2	0.0	0.0	0.0	0.0
	E4	0.0	0.0	1.8	6.0	11.5	25.7	70.0	100.0	0.0	0.0	0.0
-G-N	E1	52.7	38.6	23.4	10.6	5.0	0.0	0.0	0.0	0.0	0.0	0.0
	E2	31.6	57.4	40.8	38.5	20.0	33.4	10.0	20.0	0.0	0.0	0.0
	E3	15.7	4.0	27.1	28.5	18.3	33.3	0.0	20.0	0.0	0.0	0.0
	E4	0.0	0.0	8.7	22.4	56.7	33.3	90.0	60.0	0.0	0.0	0.0

OVER

APPENDIX 6 (Continued)

PERCENTAGE DISTRIBUTION OF HEADS PRODUCED IN EACH
EMERGENCE GROUP ACCORDING TO MONTH OF TILLER
ORIGIN (1967)

TIMOTHY		Month of Tiller Origin										
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
+G+N	E1	30.2	21.2	16.7	7.4	8.2	1.6	3.7	0.0	0.0	0.0	0.0
	E2	52.6	58.3	60.7	51.9	53.6	50.2	17.6	11.4	13.8	20.0	0.0
	E3	17.2	20.5	18.0	24.5	25.4	27.0	78.4	42.3	26.2	20.0	30.0
	E4	0.0	0.0	4.6	16.2	12.8	21.2	16.3	46.3	60.0	60.0	70.0
+G-N	E1	36.7	30.6	21.2	16.3	5.6	0.0	0.0	0.0	0.0	0.0	0.0
	E2	51.3	35.6	40.6	26.6	42.9	33.7	21.6	15.0	7.8	0.0	0.0
	E3	12.0	26.3	26.9	37.4	33.3	39.2	30.1	41.0	16.3	10.0	0.0
	E4	0.0	7.5	11.3	19.7	18.2	27.1	28.3	44.0	75.9	90.0	100.0
-G+N	E1	26.2	27.3	20.2	11.7	19.3	14.0	6.7	2.5	0.0	10.0	0.0
	E2	47.8	61.4	51.3	51.6	46.9	26.1	16.3	14.8	15.0	30.0	10.0
	E3	26.0	11.3	28.5	29.7	22.2	28.6	46.4	41.0	28.5	20.0	40.0
	E4	0.0	0.0	0.0	7.0	11.6	31.3	30.6	41.7	56.5	40.0	50.0
-G-N	E1	20.7	26.2	17.2	19.5	10.6	8.6	3.4	0.0	0.0	0.0	0.0
	E2	48.3	52.0	46.3	38.1	40.4	29.4	30.6	10.2	10.5	10.0	0.0
	E3	29.5	20.8	31.5	30.9	32.8	32.0	39.7	44.4	29.5	20.0	33.3
	E4	1.5	1.0	5.0	11.5	16.2	30.0	26.3	45.4	60.0	70.0	66.7

OVER

APPENDIX 6 (Continued)

PERCENTAGE DISTRIBUTION OF HEADS PRODUCED IN EACH
EMERGENCE GROUP ACCORDING TO MONTH OF TILLER
ORIGIN (1967)

PRAIRIE GRASS		Month of Tiller Origin										
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
+G+N	E1	61.6	36.2	29.1	7.6	30.8	4.7	0.0	0.0	0.0	0.0	0.0
	E2	36.2	59.2	33.7	62.9	23.1	12.8	11.6	0.0	0.0	0.0	0.0
	E3	2.2	4.6	36.2	18.4	38.5	63.6	32.0	25.0	0.0	0.0	0.0
	E4	0.0	0.0	1.0	11.1	7.6	18.9	56.4	75.0	0.0	0.0	0.0
+G-N	E1	64.2	14.6	11.4	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	E2	34.2	68.7	38.8	40.7	14.3	1.6	0.0	0.0	0.0	0.0	0.0
	E3	1.6	16.7	41.4	36.6	61.5	70.9	20.0	0.0	0.0	0.0	0.0
	E4	0.0	0.0	8.2	21.4	24.2	27.5	80.0	100.0	0.0	0.0	0.0
-G+N	E1	59.8	53.6	36.7	6.7	16.4	3.6	0.0	0.0	0.0	0.0	0.0
	E2	28.2	31.1	34.2	53.0	38.4	28.3	20.0	0.0	0.0	0.0	0.0
	E3	12.9	15.3	29.1	35.3	43.9	64.8	10.0	33.3	0.0	0.0	0.0
	E4	0.0	0.0	0.0	5.5	1.3	8.3	70.0	66.7	0.0	0.0	0.0
-G-N	E1	40.0	20.6	32.8	22.1	22.2	0.0	0.0	0.0	0.0	0.0	0.0
	E2	57.1	71.4	46.2	32.2	38.9	10.0	10.0	0.0	0.0	0.0	0.0
	E3	2.9	8.0	14.9	36.3	16.7	10.0	40.0	0.0	0.0	0.0	0.0
	E4	0.0	0.0	6.1	9.4	22.2	80.0	50.0	100.0	0.0	0.0	0.0

APPENDIX 7

DATA ON SELECTED COMPONENTS OF SEEDHEADS IN EMERGENCE GROUPS 1966

<u>Emergence Group</u>	<u>Treatment</u>	<u>Mean Head Length (cm)</u>	<u>Mean Spikelet Number/Head</u>	<u>Mean Floret Number/Head</u>	<u>Mean Total Culm Length (cm)</u>
<u>PERENNIAL RYEGRASS</u>					
E1	+G+N	23.50	19.6	134.6	87.4
16.11.66	+G-N	23.25	23.0	128.4	90.2
to	-G+N	26.15	22.0	158.4	91.7
4.12.66	-G-N	21.67	20.8	129.8	88.6
E2	+G+N	18.48	20.1	112.8	84.7
5.12.66	+G-N	19.74	17.8	94.8	83.1
to	-G+N	20.27	20.5	131.6	77.4
21.12.66	-G-N	19.27	19.3	104.4	89.2
E3	+G+N	16.88	18.3	111.0	88.6
22.12.66	+G-N	16.97	20.3	74.8	80.3
to	-G+N	16.39	19.8	102.8	89.4
4.1.67	-G-N	17.64	20.1	76.4	92.6
E4	+G+N	11.45	16.5	97.3	72.4
5.1.67	+G-N	11.16	16.2	56.6	66.7
to	-G+N	12.19	17.4	87.1	77.3
20.1.67	-G-N	12.73	18.6	71.6	73.3
<u>PRAIRIE GRASS</u>					
E1	+G+N	63.82	43.5	143.4	96.2
15.11.66	+G-N	48.84	26.7	79.6	93.7
to	-G+N	64.69	55.1	185.6	183.6
1.12.66	-G-N	64.22	48.3	173.6	167.3
E2	+G+N	47.91	25.8	68.0	101.7
2.12.66	+G-N	46.10	26.2	71.4	98.6
to	-G+N	48.20	32.6	110.8	161.3
16.12.66	-G-N	37.60	16.3	55.6	146.1
E3	+G+N	21.38	18.5	62.8	90.2
17.12.66	+G-N	24.36	18.9	41.5	86.4
to	-G+N	25.33	20.5	71.6	113.9
31.12.66	-G-N	24.25	15.4	55.6	106.2
E4	+G+N	19.26	12.6	47.4	81.2
1.1.67	+G-N	19.14	11.9	36.7	74.9
to	-G+N	21.60	13.7	59.9	78.6
14.1.67	-G-N	21.52	12.8	41.1	83.7

APPENDIX 7 (Continued)

DATA ON SELECTED COMPONENTS OF SEEDHEADS
IN EMERGENCE GROUPS 1966

<u>TIMOTHY</u>	<u>Treatment</u>	<u>Head Length</u>	<u>Mean Seed Number/Head</u>	<u>Culm Length</u>
E1	+G+N	14.34	378.7	112.6
21.12.66	+G-N	13.01	303.2	110.4
to	-G+N	15.20	416.1	123.7
4.1.67	-G-N	15.75	406.0	119.6
E2	+G+N	14.75	316.4	103.0
5.1.67	+G-N	14.38	291.3	106.2
to	-G+N	13.85	408.9	114.3
20.1.67	-G-N	17.25	412.4	116.6
E3	+G+N	9.31	301.5	93.7
21.1.67	+G-N	8.15	253.6	98.4
to	-G+N	12.08	366.6	111.2
5.2.67	-G-N	10.53	321.8	109.5
E4	+G+N	7.66	237.2	88.9
6.2.67	+G-N	7.76	206.8	90.7
to	-G+N	7.40	302.0	108.4
20.2.67	-G-N	7.48	242.1	98.6

APPENDIX 7

DATA ON SELECTED COMPONENTS OF SEEDHEADS IN EMERGENCE GROUPS 1967

	<u>Date of</u> <u>Marking</u>	<u>Mean Head</u> <u>Length(cm)</u>	<u>Mean Spikelet</u> <u>Number/Head</u>	<u>Mean Floret</u> <u>Number/Head</u>	<u>Total Mean</u> <u>Culm Length</u> (cm)
<u>PERENNIAL RYEGRASS</u>					
E1	+G+N 29.11.67	25.72	22.3	162.5	99.6
	+G-N 4.12.67	20.67	14.9	134.3	88.1
	-G+N 22.11.67	25.59	24.0	162.2	96.8
	-G-N 19.11.67	23.23	23.8	162.1	89.3
E2	+G+N 13.12.67	20.91	20.1	111.5	82.1
	+G-N 20.12.67	18.57	20.8	115.5	73.8
	-G+N 6.12.67	20.50	22.9	117.9	86.5
	-G-N 6.12.67	21.77	23.8	123.1	95.1
E3	+G+N 26.12.67	18.68	18.9	102.2	96.7
	+G-N 1.1.68	14.39	18.9	60.5	54.8
	-G+N 20.12.67	18.19	19.8	95.5	92.1
	-G-N 20.12.67	17.87	22.9	87.9	79.5
E4	+G+N 12.1.68	18.15	18.4	104.6	71.1
	+G-N 15.1.68	16.56	18.7	76.6	67.5
	-G+N 2.1.68	15.01	17.9	81.9	87.5
	-G-N 2.1.68	17.49	18.1	69.0	83.3
<u>PRAIRIE GRASS</u>					
E1	+G+N 26.11.67	25.63	19.6	114.6	99.1
	+G-N 26.11.67	22.27	17.3	101.9	94.1
	-G+N 19.11.67	36.65	43.9	281.4	157.9
	-G-N 15.11.67	26.40	24.7	108.1	116.6
E2	+G+N 10.12.67	26.20	19.1	99.3	97.0
	+G-N 10.12.67	22.56	15.9	93.6	100.6
	-G+N 3.12.67	32.59	33.1	164.3	142.3
	-G-N 29.11.67	29.30	25.6	125.0	128.5
E3	+G+N 21.12.67	24.91	19.9	93.6	77.0
	+G-N 21.12.67	24.16	11.1	60.2	77.3
	-G+N 17.12.67	26.56	22.3	89.9	114.6
	-G-N 13.12.67	24.04	17.1	74.9	117.4
E4	+G+N 29.12.67	22.29	21.9	77.7	77.9
	+G-N 29.12.67	15.85	9.7	45.4	47.2
	-G+N 29.12.67	26.36	26.0	114.7	76.2
	-G-N 26.12.67	22.97	16.3	73.5	88.7

APPENDIX 7 (Continued)

DATA ON SELECTED COMPONENTS OF SEEDHEADS
IN EMERGENCE GROUPS 1967

<u>TIMOTHY</u>	<u>Date of</u> <u>Marking</u>	<u>Head</u> <u>Length</u>	<u>Mean Seed Number</u> <u>Per Head</u>	<u>Culm</u> <u>Length</u>
E1 +G+N	23.1.68	10.60	352.0	95.7
+G-N	21.1.68	9.43	314.6	98.2
-G+N	11.1.68	11.08	319.6	100.9
-G-N	16.1.68	12.62	311.1	100.0
E2 +G+N	6.2.68	8.20	390.2	95.2
+G-N	4.2.68	8.14	216.9	91.5
-G+N	25.1.68	7.55	294.1	107.1
-G-N	30.1.68	10.25	317.3	110.8
E3 +G+N	20.2.68	8.33	294.1	89.6
+G-N	18.2.68	9.74	280.5	91.3
-G+N	8.2.68	13.16	303.2	102.0
-G-N	13.2.68	8.19	273.1	97.1
E4 +G+N	2.3.68	7.27	195.9	88.3
+G-N	2.3.68	4.47	256.7	85.0
-G+N	21.2.68	10.83	250.4	87.3
-G-N	26.2.68	8.89	233.4	93.8

APPENDIX 8

RESULTS OF ANALYSIS OF VARIANCE BETWEEN
MEANS OF TREATMENT AND EMERGENCE GROUPS
(1966)

	<u>Head Length</u>	<u>Spikelet Number</u>	<u>Floret Number</u>	<u>Total Culm Length</u>
<u>PERENNIAL RYEGRASS</u>				
<u>Treatment</u>				
+G+N	17.58 a	18.62 a	113.9 ABa	83.3 a
+G-N	17.78 a	19.32 a	88.6 Cb	80.1 a
-G+N	18.75 a	19.92 a	120.0 Aa	84.0 a
-G-N	17.85 a	19.90 a	95.6 BCb	85.9 a
<u>Emergence Group</u>				
E1	23.64 Aa	21.37 Aa	137.8 Aa	89.5 Aa
E2	19.44 Bb	19.42 ABb	110.9 Bb	83.6 Aa
E3	16.97 Bc	19.63 ABab	91.2 Cc	87.7 Aa
E4	11.88 Cd	17.16 Bc	78.2 Dd	72.4 Bb
<u>PRAIRIE GRASS</u>				
<u>Treatment</u>				
+G+N	38.09 a	25.1 a	80.4 Aab	92.3 Ab
+G-N	34.61 a	20.9 a	57.3 Ab	88.4 Ab
-G+N	39.96 a	30.5 a	107.0 Aa	134.4 Aa
-G-N	36.90 a	23.2 a	81.5 Aab	125.8 Aa
<u>Emergence Group</u>				
E1	60.39 Aa	43.4 Aa	145.6 Aa	135.2 Aa
E2	44.95 Bb	25.2 Bb	76.4 Bb	126.9 Aab
E3	23.83 Cc	18.3 Bbc	57.9 Bb	99.2 Abc
E4	20.38 Cc	12.7 Bc	46.3 Bb	79.6 Ac
<u>TIMOTHY</u>				
		<u>SEED NUMBER PER HEAD</u>		
<u>Treatment</u>				
+G+N	11.52 a	308.4 BCb		99.6 Bc
+G-N	10.82 a	263.7 Cc		101.4 Bb
-G+N	12.13 a	373.4 Aa		114.4 Aa
-G-N	12.75 a	345.6 ABa		111.1 Aa
<u>Emergence Group</u>				
E1	14.58 Aa	376.0 Aa		116.6 Aa
E2	15.06 Aa	357.2 ABa		119.0 Bb
E3	10.02 Bb	310.9 Bb		103.2 Cc
E4	7.58 Bc	247.0 Cc		96.6 Dd

APPENDIX 8 (Continued)

RESULTS OF ANALYSIS OF VARIANCE BETWEEN MEANS
OF TREATMENT AND EMERGENCE GROUPS (1967)

	Head Length	Spikelet Number	Floret Number	Total Culm Length
<u>PERENNIAL RYEGRASS</u>				
<u>Treatment</u>				
+G+N	20.86 Aa	19.91 a	120.2 a	87.4 a
+G-N	17.55 Bb	18.34 a	96.7 a	71.0 a
-G+N	19.82 ABa	21.14 a	114.4 a	90.7 a
-G-N	20.09 ABa	22.15 a	110.5 a	86.8 a
<u>Emergence Group</u>				
E1	23.80 Aa	21.24 a	155.2 Aa	93.4 a
E2	20.44 Bb	21.89 a	117.0 Bb	84.4 a
E3	17.28 Cc	20.13 a	86.5 Cc	80.8 a
E4	16.80 Cc	18.28 a	83.0 Cc	77.4 a
<u>PRAIRIE GRASS</u>				
<u>Treatment</u>				
+G+N	24.76 ABbc	20.10 Bbc	96.3 ABb	87.8 BCb
+G-N	21.21 Bc	13.50 Bc	75.2 Bb	79.8 Cb
-G+N	30.54 Aa	31.32 Aa	162.6 Aa	122.8 Aa
-G-N	25.68 ABb	20.92 Bb	95.4 ABb	112.8 ABa
<u>Emergence Group</u>				
E1	27.74 Aa	26.36 a	151.5 a	116.9 Aab
E2	27.66 Aa	23.45 a	120.6 ab	117.1 Aa
E3	24.92 ABab	17.59 a	79.6 b	96.6 ABbc
E4	21.87 Bb	18.45 a	77.8 b	72.5 Bc
<u>TIMOTHY</u>				
		<u>SEED NUMBER PER HEAD</u>		
+G+N	8.60 a	308.0 a		92.18 b
+G-N	8.70 a	267.2 a		91.49 b
-G+N	10.66 a	291.8 a		99.29 a
-G-N	9.99 a	283.7 a		100.45 a
<u>Emergence Group</u>				
E1	10.93 a	324.3 a		98.69 Aa
E2	8.54 a	304.6 a		101.12 Aa
E3	9.86 a	289.7 a		95.01 ABa
E4	8.62 a	234.1 a		88.59 Bb

APPENDIX 9

DISTRIBUTION OF TIMOTHY HEADS IN
ARBITRARY HEAD LENGTH CATEGORIES

1966

Emergence Group and Treatment	Head length categories (cm)						Over 25.0
	Less than 5.0	5.1-8.0	8.1-10.0	10.1-15.0	15.1-20.0	20.1-25.0	
E1 +G+N	0	2	3	26	15	4	0
	0	4	8	25	13	1	0
	0	1	2	22	22	2	0
	0	1	4	18	19	8	0
E2 +G+N	0	1	2	23	22	2	0
	0	4	7	15	22	2	0
	0	1	2	20	23	4	0
	0	0	1	18	24	6	1
E3 +G+N	0	3	9	26	11	1	0
	1	7	11	19	10	2	0
	0	4	12	15	18	1	0
	0	6	8	18	16	2	0
E4 +G+N	2	8	11	19	10	0	0
	3	3	12	23	9	0	0
	2	6	10	21	12	0	0
	2	7	13	20	8	0	0

OVER

APPENDIX 9 (Continued)

DISTRIBUTION OF TIMOTHY HEADS IN
ARBITRARY HEAD LENGTH CATEGORIES

1967

Emergence Group and Treatment		Head length categories (cm)					Over 25.0
		Less than 5.0	5.1-8.0	8.1-10.0	10.1-15.0	15.1-20.0	
E1	+G+N	0	4	18	23	5	0
	+G-N	0	14	16	19	1	0
	-G+N	2	7	11	28	2	0
	-G-N	0	0	12	31	7	0
E2	+G+N	3	28	11	8	0	0
	+G-N	7	23	11	9	0	0
	-G+N	4	22	23	1	0	0
	-G-N	0	12	17	16	5	0
E3	+G+N	9	21	11	4	5	0
	+G-N	2	16	11	13	8	0
	-G+N	1	5	10	23	11	0
	-G-N	6	11	16	17	0	0
E4	+G+N	10	19	17	4	0	0
	+G-N	11	19	12	8	0	0
	-G+N	5	4	16	19	6	0
	-G-N	1	20	16	12	1	0

APPENDIX 10

PERCENTAGE OF SEEDHEADS WITH ANTHERS EXsertED AT EACH OBSERVATION DATE

PERENNIAL RYEGRASS								
Date	1966				1967			
	+G+N	+G-N	-G+N	-G-N	+G+N	+G-N	-G+N	-G-N
9.11	0	5	0	0	0	0	0	0
10.11	0	0	0	0	0	0	0	0
11.11	2	6	1	8	0	0	5	2
12.11	4	6	2	11				
13.11	12	20	16	24	0	0	16	8
14.11	18	27	22	40	0	0	30	11
16.11	39	36	26	34	0	0	28	17
18.11	29	39	37	42	6	0	39	23
21.11	0	0	0	0	7	0	46	34
22.11	39	51	38	56	19	0	42	30
23.11	64	72	47	67	23	0	53	43
24.11	20	26	17	24	30	0	58	47
25.11	0	3	0	0	41	4	59	50
26.11	42	60	39	67	45	16	67	52
27.11	37	48	45	27	52	20	61	61
28.11	58	66	50	62	67	30	68	70
29.11	66	72	57	78*	63	32	70	76*
30.11	74	78*	68	72	71	51	72	68
1.12	82*	74	78*	70	76	53	79*	63
2.12	80	54	66	64	57	33	46	30
3.12	76	56	64	66	82	48	57	52
4.12	62	56	60	68	86*	57	51	36
5.12	58	44	58	60	73	60	38	30
7.12	40	30	46	43	66	72	31	27
9.12	36	28	40	33	52	80	11	9
10.12	38	26	36	28	37	82	6	0
12.12					30	84*	0	0
13.12	20	16	28	22	24	63	0	0
14.12	2	14	18	20	20	47	0	0
15.12					6	36	0	0
17.12	4	2	8	6	3	11	0	0
18.12	4	0	8	2	0	2	0	0
19.12	0	0	0	0	0	2	0	0
20.12	0	0	0	0	0	2	0	0
21.12	0	0	0	0	0	0	0	0
Days Onset to Peak	21	22	21	19	17	18	21	19
Days Duration	41	43	41	41	31	27	32	31

over

APPENDIX 10 CONTINUED

PERCENTAGE OF SEEDHEADS WITH ANTHERS EXERTED AT EACH OBSERVATION DATE

TIMOTHY								
Date	1966				1967			
	+G+N	+G-N	-G+N	-G-N	+G+N	+G-N	-G+N	-G-N
26.12					0	0	0	0
28.12					0	0	2	0
30.12					0	0	2	2
31.12	0	0	0	0				
1.1	0	0	1	0	0	0	2	4
3.1	0	0	1	4				
4.1					0	1	6	6
5.1	2	0	3	6				
6.1					5	3	11	11
9.1	8	4	18	14	11	7	18	14
11.1	16	11	32	21	18	12	32	21
14.1	32	29	47	41	30	23	47	41
16.1					33	29	46	47
17.1	49	36	56	53	42	38	50	58
18.1					52	47	57	73
20.1	52	49	62	60	50	59	76	86
21.1					56	63	81	92*
22.1	57	51	69	73	52	70	72	84
23.1					56	77	92*	80
25.1	61	64	74	77	60	84*	84	78
26.1					84	76	88	66
27.1	64	72	65	67	86	73	73	67
28.1	62	68	60	61	90*	72	63	65
29.1	60	56	59	57	83	62	65	60
30.1	41	40	37	32	77	44	62	54
31.1	47	42	56	51	52	46	43	42
1.2	83	72	73	68	45	42	38	36
2.2	77	74	70	67	47	32	36	38
3.2	0	0	0	0	47	39	41	31
4.2	81	83	86	80	41	36	33	37
5.2	86	86	91*	88*	39	38	36	34
6.2	87*	88*	88	87	36	33	30	33
7.2	83	82	84	82	30	28	24	29
8.2	79	69	72	76	19	27	23	27
9.2	72	64	57	60	17	21	16	18
10.2	55	46	50	49	18	9	12	12
11.2	50	44	46	42				
12.2	48	34	42	36				
13.2	40	28	36	24	11	4	11	17
15.2	31	28	30	20	6	3	6	16
16.2	28	20	26	18				
17.2	26	20	25	16	3	0	0	7
18.2	20	16	22	14				
20.2					0	0	0	0
25.2					0	0	0	0

over

<u>TIMOTHY (Cont'd)</u>								
<u>1966</u>					<u>1967</u>			
<u>Date</u>	<u>+G+N</u>	<u>+G-N</u>	<u>-G+N</u>	<u>-G-N</u>	<u>+G+N</u>	<u>+G-N</u>	<u>-G+N</u>	<u>-G-N</u>
8.3	5	3	7	2				
15.3	1	2	2	1				
16.3	0	0	0	1				
17.3	0	0	0	0				
18.3	0	0	0	0				
Days Onset to Peak	33	29	36	34	22	19	27	23
Days Duration	70	66	74	73	46	40	50	50

over

APPENDIX 10 CONTINUED.

PERCENTAGE OF SEEDHEADS WITH ANTHERS EXSERTED
AT EACH OBSERVATION DATE

<u>PRAIRIE GRASS</u>								
<u>1966</u>					<u>1967</u>			
<u>Date</u>	<u>+G+N</u>	<u>+G-N</u>	<u>-G+N</u>	<u>-G-N</u>	<u>+G+N</u>	<u>+G-N</u>	<u>-G+N</u>	<u>-G-N</u>
28.10					0	0	0	0
30.10					0	0	1	3
1.11					0	0	3	4
2.11	0	2	0	3	0	0	7	9
3.11	0	5	0	5	0	0	20	14
4.11	2	4	0	6				
5.11					0	0	24	26
6.11	7	12	6	11				
7.11					0	0	26	31
8.11	29	16	10	26				
9.11	29	30	9	27	0	0	27	32
10.11	0	0	0	0	3	6	33	38
11.11	22	37	27	30	11	9	38	57
12.11					16	15	51	61
13.11	23	35	30	32	22	26	59	74
14.11	25	24	23	27	28	27	66	70
15.11					31	34	68	73
16.11	29	39	38	42	36	38	74	80
17.11					37	41	76	87
18.11	35	41	26	37	43	47	82	89*
20.11	54	62	21	57	43	49	87*	83
21.11	39	56	24	61	52	53	81	78
22.11	16	40	15	59	50	46	76	72
23.11	11	34	11	32	62	60	69	63
24.11	38	69*	14	68	73	63	67	61
25.11	17	29	39	41	80	68	62	61
26.11	63*	59	69*	73*	82*	73*	47	62
27.11	36	52	54	25	77	70	40	43
28.11	34	44	46	22	60	67	22	30
29.11	26	41	31	17	62	60	16	11
30.11	24	20	28	16				
2.12	17	12	15	10				
3.12					45	53	7	3
4.12	8	11	14	9				
6.12	12	8	10	14	28	18	3	2
8.12	8	12	14	10				
9.12					17	10	3	2
10.12	5	2	8	10	11	8	1	0
12.12	8	6	2	4	3	2	0	0
13.12	1	0	1	0	3	1	0	0
14.12	0	0	0	0	0	1	0	0
16.12	0	0	0	0	0	0	0	0
Days Onset to Peak	23	23	21	23	17	17	22	20
Days Duration	41	42	40	42	36	38	42	40

APPENDIX 11ANTHESIS AND SEED DEVELOPMENT DATA IN DIFFERENT
REGIONS OF TIMOTHY HEADS

<u>Head</u>	<u>Region</u>	<u>Total</u>	<u>Total Florets</u>	<u>Total</u>	<u>Percentage</u>
		<u>Florets</u>	<u>Flowering</u>	<u>Seeds</u>	<u>Seeds</u>
		<u>per</u>	<u>per Region</u>	<u>Formed</u>	<u>Formed</u>
		<u>Region</u>			
1	1	450	159	95	21.1
	2	408	240	106	26.0
	3	476	327	147	30.9
	4	508	224	80	15.7
2	1	436	172	91	20.9
	2	508	249	117	23.0
	3	410	200	87	21.2
	4	547	265	88	16.1
3	1	340	156	70	20.6
	2	457	261	96	21.0
	3	383	143	38	9.9
	4	316	83	29	9.2
4	1	628	225	69	11.0
	2	765	291	148	19.3
	3	551	283	134	24.3
	4	707	153	79	11.2
5	1	396	207	48	12.1
	2	382	259	85	22.2
	3	356	217	94	26.4
	4	470	224	74	15.7

APPENDIX 12

TECHNIQUE FOR DETERMINATION OF SEED CHLOROPHYLL AND ANTHOCYANIN CONTENT

CHLOROPHYLL CONTENT

Extraction was achieved by macerating florets in an 80 : 20 ml acetone/water mixture. After three changes of solvent extraction was usually complete and the combined macerate was Buchner-filtered and made to a volume of 100 ml with 80% acetone. The optical density of the resultant solution was determined on a Unicam SP500 spectrophotometer at wavelengths of 645 $m\mu$ and 663 $m\mu$. From the data obtained, the relative concentrations of chlorophylls a and b in the filtered solution was calculated using equations previously derived by Arnon (1949) from the coefficients of absorption for chlorophylls in aqueous acetone. The chlorophyll a : b ratio was calculated directly from these concentrations and converted to total chlorophyll % of dry matter by consideration of sample size and dry matter content.

ANTHOCYANIN CONTENT

As in the case of chlorophyll determination, the assessment of anthocyanin content in seeds of the test species was carried out using the procedure suggested by Stoddart (1964c).

Extraction was undertaken at controlled pH by macerating seed in 1% hydrochloric acid. After three changes of solvent the combined extract was filtered and made to a volume of 100 ml with 1% hydrochloric acid. Following the suggestion by Stoddart (1964c) and in the absence of further information on the exact chemical identification of the anthocyanin pigments present in each test species, the anthocyanins in the seeds of all three grasses were assumed to be identical. Pigment concentration was expressed solely in terms of optical density at 510 $m\mu$ as determined on a Unicam SP500 spectrophotometer.

APPENDIX 13

VARIATION IN SEED MOISTURE CONTENT DURING SEED DEVELOPMENT 1966-7

Perennial Ryegrass					Timothy					Prairie Grass				
Date	+G+N	+G-N	-G+N	-G-N	Date	+G+N	+G-N	-G+N	-G-N	Date	+G+N	+G-N	-G+N	-G-N
4.11.66	74.0	73.8	71.6	69.9	25.1	71.0	71.9	70.6	70.5	4.11.66	71.9	70.8	63.0	69.5
9.11.	73.0	75.0	71.4	70.0	27.1.	68.1	66.7	70.2	69.4	8.11.	71.8	70.3	70.1	71.7
14.11.	71.7	70.0	67.7	69.3	30.1	64.5	67.5	70.2	67.8	12.11.	72.6	71.0	70.0	69.8
22.11.	68.8	66.1	67.5	67.8	1.2.	71.6	73.6	75.5	71.5	18.11.	72.8	71.4	70.0	69.7
1.12.(H1)•	66.6	68.9	70.5	65.7	3.2.	70.0	71.5	73.8	69.1	21.11. •	66.3	64.7	66.1	65.2
8.12.(H2)	66.8	66.7	66.9	66.7	5.2. •	66.0	66.8	68.0	64.6	27.11.(H1)	63.6	60.8	64.7	62.0
15.12.(H3)	67.1	65.7	65.3	63.7	8.2.	64.3	64.8	62.1	60.0	1.12.	64.0	62.6	64.0	61.4
18.12.	60.3	66.3	62.1	64.0	11.2.	62.0	60.0	60.3	58.6	5.12.(H2)	60.1	59.7	59.4	56.5
21.12.(H4)	55.7	56.8	51.5	55.0	13.2.	58.8	56.8	54.2	56.7	9.12.	58.1	60.8	57.6	59.3
28.12.(H5)	46.6	48.5	47.8	46.1	15.2.(H1)	55.5	57.1	54.7	53.3	13.12.(H3)	58.7	62.7	57.0	58.9
2.1.67	34.1	34.1	36.9	35.7	18.2.	54.5	55.8	52.1	50.8	19.12.(H4)	54.7	52.8	54.4	53.8
4.1. (H6)	32.0	33.1	33.2	31.6	21.2.(H2)	51.3	52.0	52.9	51.6	23.12.	49.1	50.3	52.0	46.7
7.1.	20.1	22.4	18.7	20.3	25.2.	48.0	51.7	50.0	48.9	27.12.(H5)	43.0	43.3	43.1	42.3
10.1.	11.9	11.9	11.9	13.5	28.2. (H3)	47.7	46.2	47.0	45.8	29.12.	49.6	51.8	52.6	44.6
					4.3.	40.1	43.6	43.8	40.3	2.1.67	45.9	49.5	50.9	39.9
					8.3. (H4)	36.7	43.1	41.9	38.9	3.1. (H6)	40.3	41.6	39.9	40.3
					11.3.	32.1	36.0	37.7	30.0	7.1.	29.9	27.8	31.6	23.9
					15.3. (H5)	32.5	30.6	37.8	26.0					
					19.3.	30.0	29.0	31.8	24.2					
					22.3. (H6)	26.3	28.6	27.3	19.1					
					30.3.	16.7	19.2	17.3	13.8					

• = mean date of peak anthesis.

APPENDIX 14

CHANGES IN INDIVIDUAL WEIGHT COMPONENTS
DURING SEED DEVELOPMENT (1966-7)

<u>PERENNIAL RYEGRASS</u>												
	FRESH WEIGHT (mg)				DRY WEIGHT (mg)				MOISTURE (mg)			
	+G+N	+G-N	-G+N	-G-N	+G+N	+G-N	-G+N	-G-N	+G+N	+G-N	-G+N	-G-N
22.11.66	1.54	1.39	1.45	1.46	0.48	0.46	0.47	0.47	1.06	0.93	1.01	0.99
28.11.	1.30	1.42	1.42	1.41	0.42	0.46	0.44	0.47	0.88	0.96	0.98	0.94
1.12. (H1)	1.93	1.84	1.98	2.00	0.58	0.59	0.67	0.58	1.35	1.25	1.31	1.42
8.12. (H2)	2.97	2.73	3.04	2.91	0.89	0.82	0.92	0.87	2.08	1.91	2.12	2.04
15.12. (H3)	3.86	3.69	3.93	3.79	1.77	1.68	1.73	1.84	2.09	2.01	2.20	1.95
19.12.	5.24	5.85	5.62	5.81	2.08	1.97	2.13	2.00	3.16	3.88	3.49	3.72
21.12. (H4)	5.33	5.14	5.38	5.16	2.56 a	2.37 b	2.54 a	2.32 b	2.77	2.77	2.84	2.84
24.12.	6.50	5.91	5.73	5.93	2.62	2.38	2.58	2.39	3.88	3.53	3.15	3.54
28.12. (H5)	6.95	6.43	6.09	6.56	2.60	2.41	2.57	2.42	4.35	4.02	3.52	4.14
2.1.67	4.55	4.65	4.90	4.40	2.59	2.40	2.60	2.39	1.96	2.25	2.30	2.01
4.1. (H6)	3.77	3.66	3.91	3.58	2.57	2.45	2.61	2.45	1.20	1.21	1.30	1.13
10.1. (H7)	2.89	2.69	3.13	2.76	2.55	2.37	2.76	2.39	0.34	0.32	0.37	0.37
14.1.	2.92	2.69	2.96	2.71	2.61	2.42	2.65	2.43	0.31	0.27	0.31	0.28

APPENDIX 14

CHANGES IN INDIVIDUAL WEIGHT COMPONENTS
DURING SEED DEVELOPMENT (1966-7)

TIMOTHY												
	FRESH WEIGHT (mg)				DRY WEIGHT (mg)				MOISTURE (mg)			
	+G+N	+G-N	-G+N	-G-N	+G+N	+G-N	-G+N	-G-N	+G+N	+G-N	-G+N	-G-N
9.1.67	0.420	0.358	0.369	0.293	0.148	0.134	0.109	0.111	0.272	0.224	0.260	0.182
11.1.	0.431	0.411	0.473	0.418	0.147	0.150	0.150	0.159	0.284	0.261	0.323	0.259
17.1	0.395	0.378	0.398	0.418	0.140	0.146	0.149	0.147	0.255	0.232	0.249	0.271
25.1	0.481	0.493	0.520	0.463	0.139	0.139	0.153	0.137	0.342	0.354	0.367	0.326
7.2	0.468	0.435	0.472	0.423	0.167	0.153	0.179	0.169	0.301	0.282	0.293	0.254
13.2	0.477	0.417	0.497	0.492	0.196	0.180	0.227	0.213	0.281	0.237	0.270	0.279
15.2. (H1)	0.472	0.492	0.473	0.648	0.210	0.211	0.244	0.303	0.262	0.281	0.229	0.345
18.2.	0.587	0.620	0.589	0.642	0.267	0.274	0.282	0.316	0.320	0.346	0.307	0.326
21.2. (H2)	0.602	0.665	0.691	0.696	0.293	0.319	0.325	0.337	0.309	0.346	0.366	0.359
28.2. (H3)	0.612	0.629	0.620	0.637	0.320	0.338	0.329	0.345	0.292	0.291	0.291	0.292
2.3.	0.602	0.617	0.617	0.629	0.341	0.340	0.337	0.348	0.261	0.277	0.280	0.281
8.3. (H4)	0.547	0.594	0.596	0.576	0.348	0.338	0.346	0.352	0.199	0.256	0.250	0.224
11.3.	0.517	0.534	0.551	0.501	0.351	0.342	0.347	0.351	0.166	0.192	0.204	0.151
16.3. (H5)	0.526	0.516	0.546	0.499	0.356a	0.358a	0.358a	0.369a	0.170	0.158	0.188	0.130
19.3.	0.509	0.496	0.516	0.481	0.359	0.352	0.358	0.367	0.150	0.144	0.158	0.114
22.3. (H6)	0.478	0.484	0.483	0.448	0.353	0.346	0.354	0.362	0.125	0.138	0.129	0.086
30.3	0.420	0.432	0.421	0.421	0.350	0.349	0.350	0.363	0.070	0.083	0.071	0.058

APPENDIX 14

CHANGES IN INDIVIDUAL WEIGHT COMPONENTS
DURING SEED DEVELOPMENT (1966-7)

PRAIRIE GRASS	FRESH WEIGHT (mg)				DRY WEIGHT (mg)				MOISTURE (mg)			
	+G+N	+G-N	-G+N	-G-N	+G+N	+G-N	-G+N	-G-N	+G+N	+G-N	-G+N	-G-N
22.11.66	14.49	14.92	14.92	14.85	4.88	5.27	5.06	5.17	9.61	9.65	9.86	9.68
28.11. (H1)	17.79	17.19	20.00	17.71	6.84	6.74	7.06	6.73	10.95	10.45	12.94	10.98
5.12. (H2)	18.20	18.31	20.44	17.95	7.26	7.38	8.30	7.81	10.94	10.93	13.38	10.14
9.12.	24.08	23.72	26.34	29.58	10.09	9.30	11.17	12.04	13.99	14.42	15.17	17.54
13.12. (H3)	29.85	27.03	33.33	31.99	12.33	10.08	14.33	13.15	17.52	16.95	19.00	18.84
16.12	31.17	28.81	33.36	32.84	13.72	12.10	15.17	14.61	17.45	16.71	18.19	18.23
19.12. (H4)	32.57	30.03	33.77	33.79	14.75	14.17	15.40	15.61	17.82	15.86	18.37	18.18
22.12.	31.16	30.16	33.29	30.99	15.86	14.98	15.98	16.52	15.30	15.18	17.31	14.47
27.12. (H5)	30.21	28.61	31.40	29.94	17.22 a	16.22 b	17.87 a	17.28 a	12.99	12.39	13.53	12.66
29.12.	33.16	32.77	36.90	31.86	16.71	15.80	17.49	17.65	16.45	16.97	19.41	14.21
3.1.67 (H6)	28.41	26.80	29.56	29.42	16.96	15.65	17.77	17.56	11.45	11.15	11.79	11.86
6.1.	23.89	21.83	25.46	23.16	16.75	15.76	17.42	17.63	7.14	6.07	8.04	5.53
12.1.	21.39	19.82	22.81	20.02	16.76	15.72	17.47	17.50	4.63	4.10	5.34	2.52

APPENDIX 15Mean Weight of 1000 Seeds Developed From Heads
in Different Emergence Groups (1966)

	Treatment			
	+G+N	+G-N	-G+N	-G-N
PERENNIAL RYEGRASS (g)				
E1	1.85	1.84	1.74	1.17
E2	1.63	1.61	1.47	1.59
E3	1.56	0.86	1.36	1.16
E4	1.59	0.68	1.15	0.96
TIMOTHY (mg)				
E1	373	395	307	347
E2	367	341	368	366
E3	319	300	348	332
E4	192	272	321	320
PRAIRIE GRASS (g)				
E1	14.17	14.81	14.48	14.57
E2	16.10	16.75	15.71	16.47
E3	12.68	13.29	14.26	14.38
E4	10.05	10.75	7.22	11.28

APPENDIX 16

PERCENTAGE OF HEADS IN DIFFERENT COLOUR CATEGORIES AT SUCCESSIVE HARVEST DATES (1966-7)

Head colour categories

G = Green

B = Entirely brown

G-Y = Green-yellow

S = % heads showing natural shedding

+G+N					+G-N				-G+N				-G-N			
G	G-Y	B	S		G	G-Y	B	S	G	G-Y	B	S	G	G-Y	B	S
<u>PERENNIAL RYEGRASS</u>																
H1	91.9	7.3	0.8	0.0	90.6	8.5	0.9	0.0	93.1	3.8	3.1	0.0	96.7	3.1	0.2	0.0
H2	70.2	18.3	11.5	0.0	72.4	14.8	12.8	0.3	80.8	9.4	9.8	0.0	76.4	7.0	16.6	0.3
H3	55.4	20.8	23.8	0.3	46.2	19.4	34.4	1.1	58.2	17.1	24.7	2.6	54.3	15.1	30.6	4.8
H4	44.1	22.6	33.3	4.1	34.7	26.8	38.5	8.0	41.7	26.3	32.0	13.0	36.9	24.3	38.8	7.1
H5	15.8	19.3	64.9	22.3	16.3	19.7	64.0	30.6	16.9	18.7	64.4	31.8	12.4	16.9	70.7	28.2
H6	6.3	9.7	84.0	55.0	7.5	14.3	78.2	58.2	11.3	7.3	81.4	70.7	11.7	7.3	81.0	65.7
H7	4.5	6.2	89.3	79.4	6.5	11.1	82.4	73.0	5.7	7.1	87.2	78.9	6.2	8.4	85.4	77.6
<u>TIMOTHY</u>																
H1	70.9	11.8	17.3	0.0	79.7	7.0	13.3	0.0	88.6	5.7	5.7	0.0	76.4	7.0	16.6	0.0
H2	74.2	11.3	14.5	2.6	77.0	12.1	10.9	1.9	60.6	17.7	21.7	7.4	67.9	13.8	18.3	4.1
H3	50.9	20.0	29.1	17.8	52.1	18.2	29.7	13.2	35.2	18.2	46.6	17.1	37.1	18.6	44.3	18.6
H4	27.5	16.0	66.5	34.8	25.5	22.0	52.5	37.6	31.2	10.0	58.8	36.3	12.6	16.5	70.9	50.4
H5	14.9	11.7	73.4	61.7	8.3	15.0	76.7	70.0	6.3	3.6	90.1	75.5	5.7	6.5	87.8	80.5
H6	2.2	5.6	92.2	83.4	7.3	4.1	88.5	79.7	9.8	2.4	87.8	76.9	0.0	2.5	97.3	86.0
<u>PRAIRIE GRASS</u>																
H1	78.4	10.2	11.4	0.0	81.8	11.0	7.2	0.0	84.1	9.1	6.8	0.0	78.3	12.2	9.5	0.0
H2	56.6	24.9	17.5	1.7	60.3	23.3	16.4	0.3	75.7	12.2	12.1	0.6	63.7	17.1	19.2	1.8
H3	36.2	28.0	35.8	24.4	28.7	35.3	36.0	19.7	49.0	16.3	34.7	10.4	43.7	25.4	30.9	24.0
H4	25.3	14.1	60.6	41.0	18.9	22.8	58.3	51.0	27.9	14.5	57.6	39.7	17.4	22.1	60.5	47.1
H5	12.7	12.7	74.6	77.2	14.0	12.1	73.9	70.8	10.1	4.4	85.5	60.3	12.1	12.0	75.9	70.6
H6	7.2	2.0	90.8	81.9	2.4	5.4	92.2	82.6	8.3	3.2	88.5	78.4	1.6	5.3	93.1	86.2

APPENDIX 17

PERCENTAGE OF SEEDS IN DIFFERENT COLOUR CATEGORIES AT SUCCESSIVE HARVEST DATES (1966-7)

Seed colour categories G = Green G-Y = Green-yellow B = Entirely brown													
PA.	+G+N				+G-N			-G+N			-G-N		
	G	G-Y	B		G	G-Y	B	G	G-Y	B	G	G-Y	B
	<u>PERENNIAL RYEGRASS</u>												
0	H1	91.3	8.4	0.3	93.6	5.1	1.3	91.4	6.3	2.3	96.2	4.6	0.2
7	H2	77.1	18.6	4.3	76.3	11.1	12.6	84.3	12.4	3.3	76.4	14.7	8.9
14	H3	59.2	22.1	18.7	53.6	24.3	22.1	56.7	28.7	14.6	56.1	20.9	23.0
21	H4	51.4	18.2	30.4	47.4	17.6	35.0	50.0	19.6	30.4	48.3	16.3	35.4
28	H5	37.7	15.6	46.7	30.9	16.4	52.7	40.1	12.1	47.8	38.9	12.8	48.3
35	H6	18.6	10.3	71.1	12.6	9.2	78.2	22.7	7.6	69.7	17.6	9.3	73.1
42	H7	12.2	5.1	82.7	9.7	4.1	86.2	7.5	6.6	85.9	5.8	6.1	88.1
	<u>TIMOTHY</u>												
10	H1	71.3	13.5	15.2	77.0	15.5	7.5	81.4	11.0	7.6	71.5	13.7	14.8
17	H2	65.8	17.1	17.1	75.0	12.1	12.9	53.4	24.2	22.4	63.4	16.8	19.8
24	H3	50.4	20.9	28.7	48.4	24.6	27.0	32.7	25.9	41.4	38.8	29.7	31.5
31	H4	19.9	19.2	60.9	24.8	21.2	54.0	25.0	24.0	51.0	14.9	18.4	66.7
38	H5	15.0	18.6	66.4	11.2	17.1	71.7	8.1	10.6	81.3	5.7	10.5	83.8
45	H6	3.9	9.8	86.3	7.5	12.0	80.5	4.9	7.3	87.8	2.2	7.5	90.3
	<u>PRAIRIE GRASS</u>												
3	H1	82.3	12.7	5.0	80.9	10.2	8.9	88.0	5.2	6.8	85.8	8.2	6.0
10	H2	60.8	26.1	13.1	64.1	16.3	19.6	76.2	10.2	13.6	67.0	14.3	18.7
17	H3	41.9	29.4	28.7	53.7	21.2	25.1	57.9	20.6	21.5	51.3	28.1	20.6
24	H4	23.8	18.6	57.6	28.4	15.8	55.8	32.6	10.0	52.4	20.6	18.1	61.3
31	H5	18.2	14.7	67.1	16.7	12.7	70.6	19.3	8.1	72.6	12.8	9.1	78.1
39	H6	9.8	7.4	82.8	12.1	0.6	87.3	8.7	4.0	87.3	3.6	4.7	91.7

PA = days after peak anthesis

APPENDIX 18

CHANGES IN CHLOROPHYLL AND ANTHOCYANIN CONTENT DURING SEED DEVELOPMENT 1966.

C = total chlorophyll as a percentage of seed dry weight.
A = optical density at 510 m μ per 100 seeds.

Days from peak anthesis	Treatment							
	+G+N		+G-N		-G+N		-G-N	
	C	A	C	A	C	A	C	A
<u>PERENNIAL RYEGRASS</u>								
-23 (8.11.66)	0.231	0.019	0.274	0.016	0.251	0.021	0.249	0.018
-15	0.336	0.036	0.317	0.032	0.328	0.037	0.353	0.029
-10	0.253	0.042	0.261	0.046	0.284	0.052	0.246	0.046
- 5	0.217	0.090	0.224	0.106	0.211	0.092	0.219	0.094
0 (1.12.66)	0.176	0.168	0.156	0.172	0.198	0.165	0.191	0.180
+ 4	0.162	0.133	0.147	0.145	0.153	0.139	0.133	0.147
+ 7	0.117	0.169	0.124	0.193	0.146	0.170	0.109	0.183
+10	0.097	0.144	0.108	0.142	0.112	0.124	0.097	0.106
+14	0.070	0.100	0.073	0.116	0.071	0.137	0.064	0.101
+20	0.042	0.089	0.040	0.127	0.047	0.124	0.042	0.092
+23	0.034	0.099	0.030	0.117	0.031	0.122	0.028	0.098
+27	0.023	0.094	0.038	0.108	0.035	0.156	0.019	0.106
+31	0.021	0.087	0.019	0.097	0.026	0.091	0.026	0.073
+35	0.018	0.049	0.011	0.052	0.013	0.061	0.012	0.038
+40	0.014	0.032	0.012	0.024	0.008	0.040	0.008	0.030
+45	0.019	0.021	0.014	0.029	0.019	0.027	0.016	0.020
<u>TIMOTHY</u>								
-26	0.208	0.054	0.283	0.068	0.257	0.049	0.232	0.071
-19	0.179	0.027	0.190	0.037	0.207	0.035	0.191	0.035
-11	0.239	0.020	0.237	0.023	0.279	0.026	0.234	0.029
- 6	0.193	0.046	0.204	0.041	0.187	0.057	0.216	0.045
- 4	0.143	0.113	0.193	0.099	0.134	0.112	0.207	0.106
0	0.106	0.184	0.097	0.172	0.114	0.191	0.112	0.186
+ 5	0.119	0.130	0.108	0.121	0.097	0.143	0.126	0.141
+10	0.128	0.074	0.119	0.092	0.116	0.086	0.114	0.082
+12	0.147	0.061	0.136	0.077	0.121	0.071	0.129	0.063
+15	0.136	0.070	0.124	0.072	0.117	0.063	0.131	0.067
+20	0.142	0.053	0.136	0.061	0.129	0.067	0.140	0.056
+24	0.081	0.047	0.091	0.038	0.102	0.046	0.088	0.051
+28	0.063	0.040	0.070	0.042	0.074	0.040	0.059	0.041
+33	0.037	0.052	0.038	0.040	0.038	0.036	0.029	0.038
+35	0.041	0.036	0.029	0.027	0.036	0.031	0.032	0.039
+40	0.026	0.050	0.030	0.031	0.024	0.036	0.031	0.047
+45	0.011	0.043	0.028	0.039	0.016	0.034	0.023	0.031

OVER.

APPENDIX 18 (Continued)

CHANGES IN CHLOROPHYLL AND ANTHOCYANIN CONTENT DURING
SEED DEVELOPMENT 1966

C = total chlorophyll as a percentage of seed dry weight.

A = optical density at 510 m μ per 100 seeds.

<u>PRAIRIE GRASS</u>	Treatment							
	+G+N		+G-N		-G+N		-G-N	
	C	A	C	A	C	A	C	A
-18 (8.11.66)	0.083	0.092	0.120	0.102	0.106	0.083	0.123	0.094
-10	0.154	0.207	0.137	0.226	0.146	0.209	0.138	0.125
- 5	0.131	0.504	0.130	0.487	0.147	0.495	0.156	0.508
0 (26.11.66)	0.126	0.487	0.142	0.521	0.126	0.537	0.147	0.496
+ 2	0.096	0.474	0.107	0.452	0.126	0.485	0.126	0.463
+ 5	0.086	0.426	0.102	0.461	0.112	0.473	0.109	0.461
+ 9	0.093	0.357	0.095	0.410	0.100	0.400	0.098	0.384
+13	0.090	0.392	0.081	0.452	0.087	0.362	0.089	0.341
+18	0.067	0.302	0.059	0.326	0.072	0.314	0.061	0.301
+23	0.020	0.252	0.019	0.270	0.023	0.270	0.018	0.289
+28	0.026	0.271	0.018	0.273	0.020	0.241	0.021	0.267
+33	0.018	0.322	0.019	0.289	0.018	0.296	0.012	0.338
+36	0.006	0.264	0.012	0.250	0.010	0.261	0.009	0.284
+40	0.008	0.186	0.007	0.197	0.009	0.230	0.011	0.206
+45	0.003	0.192	0.001	0.148	0.006	0.124	0.005	0.140

DATA ON ONSET OF GERMINATION CAPACITY
PERENNIAL RYEGRASS, TIMOTHY AND PRAIRIE GRASS

<u>PERENNIAL RYEGRASS</u>				
Number of days seed detached following anthesis	Tests carried out immediately after harvest		Tests carried out after 3 months storage	
	% germination	% viable seeds (tetrazolium test)	% germination	% viable seeds (tetrazolium test)
5	0	0	0	0
6	0	1	0	0
7	12	9	0	0
8	10	14	0	0
9	16	19	4	3
10	25	38	2	7
11	36	43	6	8
12	39	47	20	23
13	41	50	37	36
14	50	52	73	75
15	53	55	83	87
16	54	61	87	91
17	55	63	90	90
18	62	64	89	88
19	64	68	91	89
20	70	73	90	91
25	81	84	91	90
30	88	88	90	90
<u>TIMOTHY</u>				
8	0	0	0	0
10	5	7	0	0
14	8	6	0	0
17	5	8	0	1
20	9	7	4	3
22	11	9	6	6
24	14	16	11	17
27	19	21	28	26
31	26	27	86	81
33	38	34	90	92
35	53	50	93	93
38	93	94	95	92
40	92	92	94	95
43	91	90	93	92
45	92	96	95	94
<u>PRAIRIE GRASS</u>				
3	0	0	0	0
4	4	4	0	0
5	7	6	0	0
6	11	12	0	1
7	14	13	0	0
8	16	15	2	3
9	28	28	17	20
10	35	39	44	45
11	52	50	70	73
12	76	83	90	89
13	78	85	91	92
14	81	84	91	94
16	87	88	88	91
18	88	91	90	91
20	86	91	92	92

GERMINATION CAPACITY OF SEEDS FROM HEADS IN
DIFFERENT EMERGENCE GROUPS

PERENNIAL RYEGRASS

Treatment	Emergence Group	Percentage Germination (Days)					
		2	4	6	8	10	12
+G+N	1	15	61	77	78	79	83
	2	17	72	77	79	80	80
	3	23	69	83	84	84	85
	4	4	56	63	71	71	73
+G-N	1	13	75	91	92	92	92
	2	14	79	83	90	96	98
	3	3	19	29	33	36	38
	4	1	7	8	12	12	13
-G+N	1	22	82	84	84	84	84
	2	9	74	78	79	79	80
	3	10	72	77	78	78	78
	4	4	60	63	67	71	71
-G-N	1	10	64	72	79	85	87
	2	9	67	75	76	76	77
	3	5	60	67	68	69	69
	4	4	52	55	55	55	55
TIMOTHY		2	3	4	6	8	10
+G+N	1	0	82	93	93	94	95
	2	0	82	92	93	95	96
	3	0	67	79	85	87	89
	4	0	5	12	18	20	21
+G-N	1	0	84	98	99	99	99
	2	0	80	87	90	90	91
	3	0	57	62	68	70	70
	4	0	22	24	28	31	32
-G+N	1	1	85	92	95	96	97
	2	0	89	95	97	98	98
	3	0	75	85	89	89	90
	4	0	72	81	86	88	89
-G-N	1	1	93	94	95	96	96
	2	1	92	94	97	97	98
	3	0	69	75	81	85	85
	4	0	52	59	75	77	79
PRAIRIE GRASS		4	6	8	10	14	28
+G+N	1	36	86	87	94	98	98
	2	45	91	94	98	99	99
	3	6	75	89	98	99	99
	4	2	64	79	92	94	96
+G-N	1	31	83	92	94	96	96
	2	31	89	94	96	97	97
	3	8	55	82	96	97	97
	4	0	37	61	80	87	87
-G+N	1	47	87	92	95	95	95
	2	77	96	96	97	97	97
	3	42	80	99	99	99	99
	4	8	89	90	91	92	92
-G-N	1	6	74	96	97	97	97
	2	70	94	97	99	99	99
	3	36	92	97	97	97	97
	4	0	68	96	97	97	97

APPENDIX 21SEED YIELD DATA PERENNIAL RYEGRASS 1966-7

(means of 4 replicates expressed in lb.
per acre at 15% seed moisture content)

<u>DIRECT HARVEST</u>		Fresh wt.	Subsample	Seed	Seed	
Harvest	Treatment	per plot (oz)	Weight (oz)	Weight (oz)	Moisture %	lb/ac.
1	+G+N	231	32.0	1.795	66.6	462
	+G-N	179	32.0	1.996	68.9	371
	-G+N	260	32.0	1.919	70.5	491
	-G-N	161	32.0	2.155	65.7	397
2	+G+N	250	28.6	1.862	66.8	577
	+G-N	158	30.0	2.039	66.7	382
	-G+N	234	19.0	1.337	66.9	582
	-G-N	154	32.0	1.947	66.7	333
3	+G+N	281	29.8	2.416	67.1	800
	+G-N	242	32.0	2.529	65.7	700
	-G+N	262	29.0	2.487	65.3	832
	-G-N	234	31.0	2.546	63.7	745
4	+G+N	218	24.0	2.063	55.7	886
	+G-N	178	22.6	1.820	57.8	646
	-G+N	266	24.6	1.845	56.5	926
	-G-N	213	24.8	2.046	57.0	807
5	+G+N	180	32.0	4.836	52.6	941
	+G-N	166	32.0	3.788	52.5	787
	-G+N	160	32.0	5.044	57.8	1136
	-G-N	152	32.0	4.571	53.1	855
6	+G+N	136	13.4	0.779	32.0	574
	+G-N	175	17.7	0.825	33.1	655
	-G+N	132	20.6	0.654	33.2	299
	-G-N	152	13.4	0.744	31.6	617
7	+G+N	123	14.0	0.536	11.9	443
	+G-N	98	16.0	0.547	11.9	315
	-G+N	129	16.0	0.496	11.9	376
	-G-N	119	14.0	0.601	13.5	472

APPENDIX 21 (Continued)

SEED YIELD DATA PERENNIAL RYEGRASS 1966-67
(means of 4 replicates expressed in lb.
per acre at 15% seed moisture content)

10 DAYS AFTER CUTTING		Fresh wt.	Subsample	Seed	Seed	
Harvest	Treatment	per plot (oz)	Weight (oz)	Weight (oz)	Moisture %	lb/ac.
1	+G+N	231	32.0	1.120	24.7	650
	+G-N	179	32.0	0.537	22.3	249
	-G+N	260	32.0	0.816	24.7	533
	-G-N	161	32.0	0.717	23.3	295
2	+G+N	250	32.0	1.450	16.3	1012
	+G-N	158	25.8	0.492	16.6	268
	-G+N	234	32.0	1.065	17.4	687
	-G-N	154	30.0	0.811	16.3	372
3	+G+N	218	19.4	1.031	13.5	1074
	+G-N	242	32.0	1.083	14.8	745
	-G+N	262	32.0	1.512	15.1	1125
	-G-N	234	32.0	1.349	15.0	895
4	+G+N	281	32.0	1.719	15.0	1370
	+G-N	178	16.8	0.910	13.3	895
	-G+N	266	16.0	0.922	13.4	1421
	-G-N	213	16.0	1.023	13.5	1261
5	+G+N		NR			
	+G-N		NR			
	-G+N		NR			
	-G-N		NR			
6	+G+N	136	9.1	0.423	14.0	580
	+G-N	175	16.6	0.698	14.1	675
	-G+N	132	32.0	0.772	13.6	294
	-G-N	152	16.0	0.437	13.2	385
7	+G+N	123	8.1	0.275	13.5	386
	+G-N	98	12.6	0.406	13.8	291
	-G+N	129	8.0	0.300	13.8	442
	-G-N	119	6.2	0.287	13.9	510

APPENDIX 21

SEED YIELD DATA TIMOTHY 1966-7
(means of 4 replicates expressed in lb per
acre at 15% seed moisture content)

<u>DIRECT HARVEST</u>						
Harvest	Treatment	Fresh wt. per plot (oz)	Seed Weight in 3 lb F.W. (oz)	Seed Moisture %	Wt. seed at 15% M.C.	lb/ac. at 15% M.C.
1	+G+N	268	0.462	55.5	0.242	123
	+G-N	224	0.725	57.1	0.366	155
	-G+N	274	0.410	54.7	0.219	114
	-G-N	310	0.611	53.3	0.350	168
2	+G+N	194	1.023	51.3	0.588	215
	+G-N	174	1.978	52.0	1.117	364
	-G+N	219	1.287	52.9	0.715	296
	-G-N	202	1.956	51.6	1.114	425
3	+G+N	183	1.495	47.7	0.923	319
	+G-N	133	2.282	46.2	1.449	367
	-G+N	201	0.871	47.0	0.543	206
	-G-N	179	1.453	45.8	0.929	315
4	+G+N	181	1.019	36.7	0.761	261
	+G-N	140	1.287	43.1	0.864	229
	-G+N	185	0.610	41.9	0.418	146
	-G-N	148	1.118	38.9	0.806	225
5	+G+N	168	0.568	32.5	0.452	143
	+G-N	111	0.741	30.6	0.607	128
	-G+N	161	0.483	37.8	0.354	107
	-G-N	142	0.547	26.0	0.478	129
6	+G+N	115	0.415	26.3	0.360	79
	+G-N	110	0.395	28.6	0.333	70
	-G+N	182	0.573	27.3	0.490	169
	-G-N	112	0.789	19.1	0.751	159

APPENDIX 21 (Continued) SEED YIELD DATA TIMOTHY 1966-67
 (means of 4 replicates expressed in lb per
 acre at 15% seed moisture content)

<u>10 DAYS AFTER CUTTING</u>		Fresh wt.	Seed Weight	Seed	Wt. seed	lb/ac.
Harvest	Treatment	per plot	in 3 lb F.W.	Moisture	at 15%	at 15%
		(oz)	(oz)	%	M.C.	M.C.
1	+G+N	194	0.753	17.1	0.733	269
	+G-N	224	0.787	18.2	0.757	321
	-G+N	274	0.451	14.9	0.452	234
	-G-N	310	0.596	16.6	0.585	343
2	+G+N	268	0.658	17.2	0.641	350
	+G-N	174	1.303	18.1	1.255	413
	-G+N	197	1.049	14.9	1.035	386
	-G-N	202	1.278	16.1	1.261	482
3	+G+N	183	1.048	13.3	1.069	370
	+G-N	133	1.652	14.1	1.669	420
	-G+N	201	0.752	12.8	0.771	293
	-G-N	179	0.957	12.5	0.985	333
4	+G+N	181	0.981	14.4	0.988	338
	+G-N	140	0.939	14.1	0.949	251
	-G+N	185	0.469	13.9	0.475	166
	-G-N	148	1.020	14.0	1.032	289
5	+G+N	168	0.455	14.7	0.457	145
	+G-N	111	0.624	14.5	0.628	132
	-G+N	161	0.455	15.3	0.453	138
	-G-N	142	0.438	15.0	0.438	118
6	+G+N	115	0.338	12.5	0.348	77
	+G-N	110	0.293	12.9	0.300	62
	-G+N	182	0.328	13.0	0.336	116
	-G-N	112	0.497	12.8	0.510	108

APPENDIX 21 (Continued)

SEED YIELD DATA PRAIRIE GRASS 1966-7
(means of 4 replicates expressed in lb.
per acre at 15% seed moisture content)

DIRECT HARVEST						
Harvest	Treatment	Fresh wt. per plot (oz)	Subsample Weight (oz)	Seed Weight (oz)	Seed Moisture %	lb/ac at 15% M.C.
1	+G+N	202	32.0	3.376	63.6	830
	+G-N	186	32.0	2.004	60.8	489
	-G+N	278	32.0	3.093	64.7	1015
	-G-N	215	32.0	3.160	62.0	864
2	+G+N	208	16.0	2.120	60.1	1142
	+G-N	202	20.0	1.485	59.7	609
	-G+N	292	27.0	3.167	59.4	1486
	-G-N	190	28.0	3.788	56.5	1153
3	+G+N	233	29.7	5.912	58.7	2250
	+G-N	241	32.0	6.550	62.7	1964
	-G+N	307	25.5	5.312	57.0	3123
	-G-N	241	27.0	4.765	58.9	2078
4	+G+N	289	32.0	7.250	54.7	2887
	+G-N	215	27.0	5.192	52.8	2090
	-G+N	252	25.4	6.134	54.4	3637
	-G-N	291	32.0	7.998	53.8	3192
5	+G+N	334	23.5	5.964	43.0	5158
	+G-N	268	25.2	5.599	43.3	3605
	-G+N	413	32.0	8.352	43.1	4947
	-G-N	262	27.0	6.874	42.3	4109
6	+G+N	262	32.0	4.555	40.3	2377
	+G-N	175	29.7	4.700	41.6	1727
	-G+N	279	32.3	4.830	39.9	2677
	-G-N	216	30.1	4.929	40.3	2255

APPENDIX 21 (Continued)

SEED YIELD DATA PRAIRIE GRASS 1966-7
(means of 4 replicates expressed in lb.
per acre at 15% seed moisture content)

<u>10 DAYS AFTER CUTTING</u>		Fresh wt.	Subsample	Seed	Seed	lb/ac.
Harvest	Treatment	per plot	Weight	Weight	Moisture	at 15%
		(oz)	(oz)	(oz)	%	M.C.
1	+G+N	202	32.0	6.349	22.5	1609
	+G-N	186	32.0	5.044	21.7	1203
	-G+N	278	32.0	6.772	23.1	2325
	-G-N	215	32.0	7.301	21.9	2001
2	+G+N	208	32.0	3.633	17.2	2094
	+G-N	202	32.0	4.440	18.1	2458
	-G+N	292	32.0	4.571	16.8	3717
	-G-N	190	32.0	4.557	17.4	2393
3	+G+N	289	32.0	2.910	16.7	3124
	+G-N	241	32.0	4.046	17.1	2703
	-G+N	413	32.0	3.432	16.9	3944
	-G-N	291	32.0	3.667	16.8	2970
4	+G+N	233	16.4	6.727	14.2	4512
	+G-N	215	16.5	5.238	14.8	3210
	-G+N	307	18.1	5.222	14.1	4610
	-G-N	241	17.0	5.419	14.6	3731
5	+G+N	334	6.0	5.016	13.3	4863
	+G-N	335	10.7	3.684	13.3	3440
	-G+N	252	8.2	6.561	13.3	4797
	-G-N	262	8.2	5.608	13.1	4274
6	+G+N	262	8.2	3.080	15.2	2289
	+G-N	263	8.4	2.395	16.4	1760
	-G+N	279	6.6	3.124	14.7	2488
	-G-N	216	8.9	3.153	14.8	1941

APPENDIX 22

SEED YIELD DATA 1967/8 (MEANS OF 4 REPLICATES
EXPRESSED AT 15% SEED MOISTURE CONTENT)

Treatment	Mean Fresh Wt.per plot (lb)	Subsample Weight(g)	Seed Weight (g)	lb/ac. at 15% M.C.
<u>PERENNIAL RYEGRASS</u>				
<u>Direct Harvest (oz)</u>				
+G+N (3.1.68)	122.3	48	42.94	530
+G-N (11.1.68)	144.8	48	34.01	505
-G+N (30.12.67)	116.3	48	23.81	385
-G-N (28.12.67)	106.0	48	20.07	308
<u>10 days after cutting</u>				
+G+N	122.3	24	20.33	596
+G-N	144.8	24	15.31	528
-G+N	116.3	24	7.21	256
-G-N	106.0	24	8.82	334
<u>TIMOTHY</u>				
<u>Direct Harvest (lb)</u>				
+G+N (4.3.68)	42.7	48	18.22	83
+G-N (1.3.68)	43.1	48	29.88	124
-G+N (27.2.68)	42.5	32	21.32	210
-G-N (25.2.68)	43.3	32	30.22	285
<u>10 days after cutting</u>				
+G+N	42.7	48	12.93	82
+G-N	43.1	48	14.23	87
-G+N	42.5	32	16.70	213
-G-N	43.3	32	18.68	272
<u>PRAIRIE GRASS</u>				
<u>Direct Harvest</u>				
+G+N (26.12.67)	73.75	32	142.78	1000
+G-N (26.12.67)	81.81	32	32.11	277
-G+N (20.12.67)	72.06	32	220.10	2672
-G-N (18.12.67)	73.00	32	150.10	1836
<u>10 days after cutting</u>				
+G+N	73.75	32	65.70	781
+G-N	81.81	32	27.24	380
-G+N	72.06	32	139.60	2406
-G-N	73.00	32	97.60	1731

APPENDIX 23

Relationship Between Seed Yield and Germination Capacity at Different Harvest Periods Following Anthesis Depending on Harvesting Method (1966) (Mean Values all Treatments)

	Days after Peak Anthesis	DIRECT HARVEST			SWATH HARVEST		
		Yield lb/ac	Germination %	Viable Seed Yield lb/ac	Yield lb/ac	Germination %	Viable Seed Yield lb/ac
Ryegrass	0	436	15	65	430	12	52
	7	470	34	160	584	55	321
	14	770	63	485	960	68	653
	21	810	85	689	1236	84	1038
	28	930	84	781	N.R.	N.R.	N.R.
	35	540	84	454	650	87	566
	42	404	87	351	410	86	353
Timothy	10	140	5	7	292	42	123
	17	325	5	16	383	82	314
	24	302	14	42	354	94	333
	31	215	25	54	261	95	248
	38	127	95	121	133	94	125
	45	119	95	113	91	95	86
Prairie Grass	3	804	87	700	1780	87	1549
	10	1096	92	1008	2670	94	2510
	17	2350	94	2209	3186	95	3027
	24	2950	94	2773	4020	96	3859
	31	4450	97	4317	4346	97	4216
	39	2260	95	2147	2080	96	1997

APPENDIX 24

Relationship Between Seed Yield and Germination Capacity at Different Harvest Periods Following Anthesis Depending on Harvesting Method (1967) (Mean Values All Treatments)

	Days After Peak Anthesis	DIRECT HARVEST			SWATH HARVEST		
		Yield lb/ac	Germination %	Viable Seed Yield lb/ac	Yield lb/ac	Germination %	Viable Seed Yield lb/ac
Ryegrass	16	229	68	156	377	71	268
	23	321	82	263	411	83	341
	30	432	83	359	429	81	347
	37	276	82	226	368	83	305
	43	187	84	157	203	83	168
Timothy	7	87	0	0	187	51	95
	16	277	7	19	209	79	164
	23	231	16	37	199	95	189
	30	176	31	55	154	96	148
	37	92	90	78	86	96	83
	43	67	92	62	62	96	60
Prairie Grass	16	429	96	412	1082	97	1050
	23	871	95	827	1199	95	1139
	30	1446	94	1359	1325	96	1272
	37	1186	96	1139	1217	96	1168
	43	579	96	556	562	96	540

	Av. Number Florets Open/Head							Temp °F	RH %	Wind Speed		Rain	Light Units (treatments)						
	1	2	3	4	5	6	7			Tr. 3&5	Tr. 4&7		1	2	3	4	5	6	7
M/N								48	90	12.28	9.65	Nil							
1								44	98										
2								40	98										
3								39	99										
4								39	98				0	0	0	0	0	0	0
5								41	99				0	1	2	1	1	1	0
6								48	98				38	46	152	46	92	46	15
7								53	82				138	166	553	166	332	166	55
8	0.0	0.0		0.0		0.0		59	76	2.41	2.04		231	277	923	277	554	277	92
9	0.4	0.7		0.2		0.3		62	71	2.36	2.04		245	294	979	294	979	294	294
10	1.1	0.4	0.0	0.0	0.0	1.8		65	62	5.37	4.41		334	1335	1335	401	1335	1335	401
11	1.9	2.5	0.3	0.1	1.9	6.2	0.0	66	58	6.98	5.52		430	1721	1721	516	1721	1721	516
U/D	8.8	14.2	15.9	13.3	15.8	13.4	8.7	62	48	5.26	4.36	Nil	452	1808	1808	542	1808	1808	542
1	10.2	12.5	10.0	10.8	15.0	8.8	11.5	68	46	4.13	3.52		465	1858	1858	557	1858	1858	557
2	4.5	2.7	0.7	2.1	1.0	0.9	3.0	68	49	3.73	2.62		450	1800	1800	540	1800	1800	540
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56	41	4.12	3.01		404	1615	1615	485	1615	1615	485
4								57	48	4.07	2.97		331	1324	1324	397	1324	1324	397
5								56	64				243	291	971	291	971	291	291
6								54	71				151	181	603	181	362	181	60
7								56	73				64	76	254	76	152	76	26
8								58	79				7	9	29	9	18	9	3
9								57	76				2	2	6	2	4	2	1
10								56	75				2	2	8	2	5	2	1
11								57	96				2	2	7	2	4	2	1
M/N								57	99	3.16	3.09	0.02	2	2	6	2	2	2	1

39 to 68°F = 4 to 20°C

PERENNIAL RYEGRASS DAY 2 (2.12.68)

	Av. Number Florets Open/Head							Temp °F	RH %	Wind Speed		Rain	Light Units (treatments)						
	1	2	3	4	5	6	7			Tr. 3&5	Tr. 4&7		1	2	3	4	5	6	7
M/N								57	99	3.16	3.09	0.02	2	2	6	2	2	2	1
1								55	96				2	2	6	2	2	2	1
2								55	98				0	0	1	0	0	0	0
3								55	97				2	2	6	2	2	2	1
4								48	98				3	4	12	4	8	4	1
5								47	98				4	5	17	5	10	5	2
6								52	97				21	25	84	25	50	25	8
7								54	96				51	62	205	62	124	62	21
8								53	87	1.82	1.18		103	124	413	124	248	124	41
9								59	80	1.17	1.12	0.03	116	140	465	140	280	465	47
10								54	82	1.89	1.45	0.01	116	139	464	139	278	464	47
11								57	85	2.16	2.01	0.04	132	158	527	158	316	527	53
M/D	Nil	Nil	Nil	Nil	Nil	Nil	Nil	57	77	1.99	1.66	0.02	166	199	663	199	398	663	66
1								56	83	3.04	2.82	0.04	182	218	726	218	436	726	73
2								56	83	2.62	2.31	0.07	130	156	519	156	312	519	52
3								55	90	2.36	2.07	0.02	76	92	305	92	184	305	31
4								54	89	2.29	2.10	0.03	77	92	306	92	184	306	31
5								54	97				35	42	140	42	140	42	14
6								53	98				28	34	112	34	68	34	11
7								53	98				19	22	74	22	44	22	7
8								53	97				7	8	26	8	16	8	3
9								53	95				4	5	15	5	10	5	2
10								53	94				3	4	13	4	8	4	1
11								53	94				3	4	12	4	8	4	1
M/N								54	95	0.98	0.74	0.15	2	2	8	2	5	2	1

47 to 59°F = 8 to 15°C.

PERENNIAL RYEGRASS DAY 3 (3.12.68)

	Av. Number Florets Open/Head							Temp °F	RH %	Wind Speed		Rain	Light Units (treatments)						
	1	2	3	4	5	6	7			Tr. 3&5	Tr. 4&7		1	2	3	4	5	6	7
V/N								54	95	0.98	0.74	0.15	2	2	8	2	5	2	1
1								53	94				2	3	10	3	6	3	1
2								53	94				2	2	8	2	4	2	1
3								54	95				2	3	9	3	6	3	1
4								53	95				3	4	12	4	8	4	1
5								54	96				3	4	13	4	8	4	1
6								55	89				18	21	70	21	42	21	7
7								59	80				62	75	249	75	150	75	25
8								62	88				142	170	568	170	340	170	57
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66	79	0.67	0.52		177	709	709	213	709	709	213
10	4.2	8.1	6.1	6.5	4.5	3.2	5.5	69	72	1.92	1.86		323	1298	1298	388	1298	1298	388
11	13.6	20.3	12.7	11.6	13.3	9.8	16.4	71	55	2.24	2.24		306	1225	1225	368	1225	1225	368
U/D	9.5	20.2	9.0	11.9	16.5	3.7	14.1	59	87	2.37	2.27	0.05	134	160	534	160	320	534	53
1	7.4	8.7	5.3	4.2	11.4	0.8	7.5	68	62	2.61	2.54		331	1324	1324	397	1324	1324	397
2	2.1	0.9	0.4	0.7	0.9	1.2	0.3	68	67	2.66	2.56		390	1559	1559	468	1559	1559	468
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	69	48	2.68	2.59		336	1342	1342	403	1342	1342	403
4								71	47	2.67	2.53		285	1141	1141	342	1141	1141	342
5								62	80	2.18	2.04		126	503	503	151	503	503	151
6								60	81				49	59	195	59	118	59	20
7								62	85				19	23	75	23	46	23	8
8								58	95				0	0	0	0	0	0	0
9								55	96										
10								55	96										
11								56	95										
M/N								54	95	1.18	0.79	0.20							

53 to 71°F = 11 to 22°C.

PERENNIAL RYEGRASS DAY 4 (4.12.68)

	Av. Number Florets Open/Head							Temp °F	RH %	Wind Speed		Rain	Light Units (treatments)						
	1	2	3	4	5	6	7			Tr. 3&5	Tr. 4&7		1	2	3	4	5	6	7
M/N								54	95	1.18	0.79	0.02	0	0	0	0	0	0	C
1								56	96				1	1	2	1	1	1	C
2								57	96				1	2	5	2	3	2	C
3								56	95				1	2	5	2	3	2	C
4								54	95				1	2	5	2	3	2	C
5								50	95				3	3	10	3	6	3	1
6								54	92				23	28	93	28	56	28	9
7								52	87				37	44	146	44	88	44	15
8								55	77				70	84	280	84	168	84	28
9	0.0	0.0		0.0		0.0	0.0	54	62	0.73	0.57		103	413	413	124	413	413	124
10	2.4	2.7	0.0	4.0	0.0	0.8	0.4	72	59	0.86	0.62		238	952	952	286	952	952	286
11	11.2	9.7	10.6	9.1	9.0	8.3	8.4	70	66	2.87	2.42	0.02	226	904	904	271	904	904	271
M/D	13.3	17.1	12.1	9.1	11.8	12.8	7.8	66	65	2.64	2.21		214	854	854	256	854	854	256
1	1.5	4.2	2.2	2.5	4.2	0.6	1.0	67	76	1.89	1.40		114	456	456	137	456	456	137
2	0.2	0.0	1.1	0.1	2.1	0.0	0.6	63	71	1.73	1.41	0.02	70	84	279	84	168	279	28
3	0.0		0.0	0.0	0.0		0.0	62	86	0.88	0.54		85	338	338	101	338	338	101
4								57	84	2.43	2.18		42	167	167	50	167	167	50
5								57	83	2.41	2.14		71	285	285	86	285	285	86
6								57	88				57	69	229	69	138	69	23
7								57	89				25	30	101	30	60	30	10
8								56	90				3	4	12	4	8	4	1
9								56	90				2	2	8	2	4	2	1
10								57	89				2	2	8	2	4	2	1
11								56	90				2	2	7	2	4	2	1
M/N								56	90	1.06	1.04	0.28	2	3	9	3	6	3	1

50 to 72°F = 10 to 22°C.

PERENNIAL RYEGRASS DAY 5 (5.12.68)

	Av. Number Florets Open/Head							Temp °F	RH %	Wind Speed		Rain	Light Units (treatments)						
	1	2	3	4	5	6	7			Tr. 3&5	Tr. 4&7		1	2	3	4	5	6	7
M/N								56	90	1.06	1.04	0.28	2	3	9	3	6	3	1
1								57	90				2	2	8	2	4	2	1
2								57	93				4	4	14	4	8	4	2
3								56	92				5	6	19	6	12	6	2
4								57	93				5	6	21	6	12	6	2
5								57	93				6	7	22	7	14	7	2
6								59	94				14	17	56	17	34	17	6
7								56	94				47	57	189	57	114	57	19
8								55	91				38	45	151	45	90	45	15
9								54	91	2.70	2.60		55	66	221	66	132	221	22
10								57	91	2.71	2.49	0.03	74	89	295	89	178	295	30
11								58	87	4.52	4.47	0.02	106	127	423	127	254	423	42
M/D	0.0	0.0	0.0	Nil	0.0	Nil	0.0	58	84	4.78	4.61	0.06	119	143	475	143	286	475	48
1	0.5	0.2	0.1		0.1		0.6	67	63	3.92	3.68	0.01	306	368	1225	368	736	1225	123
2	0.1	0.1	0.3		0.2		0.4	62	74	3.87	3.62		250	299	998	299	598	998	100
3	0.0	0.0	0.2		0.0		0.3	65	78	2.74	2.59		93	72	372	72	144	372	37
4			0.0				0.0	65	76	2.31	2.04		79	314	314	94	314	314	94
5								62	80	2.36	2.10		78	94	313	94	188	94	31
6								61	85				66	79	263	79	158	79	26
7								59	91				33	40	133	40	80	40	13
8								58	95				4	4	14	4	8	4	2
9								58	95				2	2	6	2	4	2	1
10								57	95				1	1	4	1	2	1	0
11								57	95				1	2	5	2	4	2	1
M/N								56	96	0.62	0.53	1.23	1	1	4	1	2	1	0

54 to 67°F = 12 to 20°C.

PERENNIAL RYEGRASS DAY 6 (6.12.68)

	Av. Number Florets Open/Head							Temp °F	RH %	Wind Speed		Rain	Light Units (treatments)						
	1	2	3	4	5	6	7			Tr. 3&5	Tr. 4&7		1	2	3	4	5	6	7
M/N								56	96	0.62	0.53	1.23	1	1	4	1	2	1	0
1								56	95				1	1	3	1	2	1	0
2								55	94				1	1	4	1	2	1	0
3								56	93				1	1	4	1	2	1	0
4								55	93				2	2	8	2	5	2	1
5								54	94				5	5	18	5	11	5	2
6								54	94				12	14	48	14	29	14	5
7								53	94				19	22	74	22	44	22	7
8								52	94				33	40	133	40	80	40	13
9	0.0	0.0	0.0		0.0	0.0		60	94	0.31	0.25	0.04	63	76	253	76	152	253	25
10	2.9	3.8	0.1	0.0	1.1	1.2	0.0	62	94	0.36	0.27	0.02	98	117	390	117	234	390	39
11	13.8	18.7	7.4	9.4	12.6	13.3	16.7	61	94	0.62	0.60	T	146	175	584	175	350	584	58
M/D	16.6	16.1	15.0	13.5	14.7	10.5	12.1	67	95	0.79	0.79	0.02	112	135	449	135	270	449	45
1	6.4	5.5	8.4	6.0	7.4	3.7	4.8	69	83	1.61	1.60	0.03	171	205	683	205	410	683	68
2	2.4	1.5	0.8	1.3	1.8	1.9	1.4	66	91	2.72	2.56	0.02	100	120	400	120	240	400	40
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61	93	2.36	2.44	0.04	69	277	277	83	166	277	83
4								63	93	2.04	1.97	0.03	55	220	220	66	132	220	66
5								63	93	2.13	2.03	0.03	58	70	233	70	140	70	70
6								62	93				26	32	105	32	64	32	11
7								61	93				15	18	60	18	36	18	6
8								60	93				8	9	31	9	19	9	3
9								60	93				4	5	17	5	10	5	2
10								60	93				6	7	22	7	13	7	2
11								60	93				6	7	23	7	14	7	2
M/N								60	93	1.57	1.54	2.05	5	6	21	6	13	6	2

52 to 69°F = 11 to 21°C.

PERENNIAL RYEGRASS DAY 7 (7.12.68)

	Av. Number Florets Open/Head							Temp °F	RH %	Wind Speed		Rain	Light Units (treatments)						
	1	2	3	4	5	6	7			Tr. 3&5	Tr. 4&7		1	2	3	4	5	6	7
M/N								60	93	1.57	1.54	2.05	5	6	21	6	13	6	2
1								60	93				5	6	20	6	13	6	2
2								58	93				5	6	20	6	13	6	2
3								59	92				5	6	19	6	11	6	2
4								58	92				5	6	19	6	11	6	2
5								58	92				6	8	25	8	15	8	3
6								51	92				10	9	39	9	17	9	4
7								49	93				18	21	71	21	43	21	7
8								50	93				73	87	290	87	174	87	29
9		0.0						54	93	3.11	3.06	0.02	109	131	435	131	261	435	44
10	0.0	1.2			0.0		0.0	61	80	3.16	3.09		243	292	972	292	583	972	97
11	0.2	1.4			0.2		0.2	58	88	3.72	3.58		154	185	617	185	370	617	62
M/D	0.3	2.1	Nil	Nil	0.3	Nil	0.2	60	77	3.61	2.93		217	261	869	261	522	869	87
1	0.1	0.3			0.0		0.0	59	76	3.24	3.13	0.03	226	271	902	271	541	902	90
2	0.0	0.0						55	94	1.31	1.23	T	72	86	286	86	172	286	29
3								54	96	2.27	2.18	0.04	34	40	134	40	80	134	13
4								53	95	3.69	3.19	0.03	52	62	208	62	125	208	21
5								53	95	4.86	4.66		18	22	73	22	44	22	22
6								54	91	4.49	4.32		22	26	88	26	53	26	9
7								53	93	4.76	4.69		10	11	38	11	22	11	4
8								54	94				5	6	19	6	11	6	2
9								55	92				5	6	19	6	11	6	2
10								54	91				2	2	8	2	5	2	1
11								53	92				3	4	12	4	7	4	2
M/N								53	93	2.36	1.92	0.07	4	5	15	5	9	5	2

49 to 61°F = 10 to 16°C.

PERENNIAL RYEGRASS DAY 8 (8.12.68)

	Av. Number Florets Open/Head							Temp °F	RH %	Wind Speed		Rain	Light Units (treatments)						
	1	2	3	4	5	6	7			Tr. 3&5	Tr. 4&7		1	2	3	4	5	6	7
M/N								53	93	2.36	1.92	0.07	4	5	15	5	9	5	2
1								54	92				3	4	12	4	7	4	1
2								54	93				3	3	10	3	6	3	1
3								54	94				3	3	10	3	6	3	1
4								54	94				3	4	12	4	7	4	1
5								54	95				5	6	10	6	11	6	2
6								55	93				24	29	95	29	58	29	10
7								58	82				111	133	444	133	266	133	44
8								57	78				142	171	569	171	341	171	57
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	57	90	3.57	2.82		101	121	403	121	242	121	40
10	2.6	0.7	0.9	1.4	0.3	1.3	0.3	55	88	3.62	2.88	T	112	134	446	134	268	446	45
11	2.6	0.8	3.1	3.7	2.1	2.5	2.2	54	78	4.36	3.71		131	157	524	157	314	524	52
M/D	10.7	9.4	10.6	11.0	10.7	8.3	10.1	55	76	6.10	3.91		170	204	680	204	408	680	68
1	16.8	16.2	17.2	14.8	15.7	12.6	14.0	54	62	6.73	5.12		42	169	169	51	102	169	51
2	1.3	4.9	5.4	2.0	3.3	0.4	2.7	53	62	6.21	5.71		184	736	736	221	442	736	221
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51	74	5.82	4.91		227	906	906	272	544	906	272
4								53	71	4.16	3.66		272	1092	1092	328	655	1092	328
5								48	72	5.37	4.90		161	193	642	193	386	193	193
6								45	76				82	98	326	98	186	98	33
7								43	91				29	35	115	35	70	35	12
8								41	85				11	13	43	13	26	13	4
9								39	78				2	2	6	2	4	2	1
10								39	83				2	2	6	2	4	2	1
11								38	84				1	2	5	2	3	2	1
M/N								37	84	4.27	3.40		1	2	5	2	3	2	1

37 to 58°F = 3 to 15°C.

PERENNIAL RYEGRASS DAY 9 (9.12.68)

	Av. Number Florets Open/Head							Temp °F	RH %	Wind Speed		Rain	Light Units (treatments)						
	1	2	3	4	5	6	7			Tr. 3&5	Tr. 4&7		1	2	3	4	5	6	7
M/N								37	84	4.27	3.40		1	2	5	2	3	2	1
1								37	88				1	1	4	1	2	1	0
2								36	92				1	1	4	1	2	1	0
3								33	93				1	1	3	1	2	1	0
4								31	93				1	1	4	1	2	1	0
5								28	94				3	4	12	4	8	4	1
6								31	93				30	35	118	35	70	35	12
7								36	86				105	126	420	126	252	126	42
8	0.0	0.0	0.0		0.0			40	76				175	210	699	210	420	210	70
9	0.5	0.1	0.1		0.1	0.0		56	55	1.10	0.89		207	249	829	249	498	249	83
10	0.5	0.2	0.9		0.0	1.8	0.0	56	59	0.98	0.74		217	260	868	260	520	868	87
11	1.3	0.0	0.9		0.2	3.9	0.2	56	48	1.96	1.89		292	350	1166	350	700	1166	117
M/D	1.0	0.8	1.6	0.0	0.3	12.5	0.0	56	45	3.43	2.97		272	326	1087	326	652	1087	109
1	12.3	16.8	9.2	1.9	11.4	16.3	2.9	70	57	4.72	4.70	T	453	549	1831	549	1098	1831	183
2	11.8	14.9	17.2	9.1	13.2	14.7	11.5	55	58	1.41	1.80	T	326	392	1305	392	784	1305	131
3	10.0	9.3	14.4	10.4	16.5	7.7	7.8	56	57	1.96	1.94	T	207	248	828	248	496	828	83
4	5.0	3.0	9.1	9.2	16.1	3.7	3.3	58	52	2.39	2.28		191	229	763	229	458	763	76
5	0.6	0.0	2.7	4.0	3.2	0.0	0.9	58	50	2.12	1.97		244	293	976	293	586	293	98
6	0.0		0.0	0.2	0.0		0.0	53	49				177	212	707	212	424	212	71
7				0.0				50	50				75	89	298	89	178	89	30
8								45	48				12	14	47	14	28	14	5
9								47	63				0	0	1	0	0	0	0
10								46	82										
11								42	91										
M/N								43	96	1.31	1.09								

28 to 70° = -2 to +21°C.

PERENNIAL RYEGRASS DAY 10 (10.12.68)

	Av. Number Florets Open/Head							Temp °F	RH %	Wind Speed		Rain	Light Units (treatments)						
	1	2	3	4	5	6	7			Tr. 385	Tr. 487		1	2	3	4	5	6	7
M/N								43	96	1.31	1.09								
1								40	93										
2								39	94										
3								38	93										
4								39	93				0	0	0	0	0	0	0
5								38	93				3	3	10	3	6	3	1
6								47	93				42	50	166	50	100	50	17
7								50	93				113	135	451	135	270	135	45
8								55	76				208	249	831	249	498	249	83
9								60	50	1.36	1.20		321	385	1284	385	1284	385	385
10								60	46	1.36	1.21		400	1600	1600	480	1600	1600	480
11	1.9	5.6	1.9	0.8	1.9	1.2	1.7	67	38	1.41	1.30		363	1452	1452	436	1452	1452	436
M/D	2.6	6.5	2.4	0.3	2.0	4.5	3.5	62	40	2.06	2.00	Nil	398	1592	1592	478	1592	1592	478
1	10.0	11.0	9.6	17.3	13.4	4.2	10.9	61	37	3.19	2.96		253	1013	1013	304	1013	1013	304
2	10.9	7.0	11.6	13.2	12.9	6.5	26.9	61	40	4.97	4.53		300	1201	1201	360	1201	1201	360
3	3.7	4.7	16.2	11.2	10.4	2.0	27.3	62	46	5.16	5.09		215	858	858	257	858	858	257
4	1.4	1.9	9.4	4.3	6.7	1.7	18.1	62	51	9.32	8.37		287	1148	1148	344	1148	1148	344
5	0.0	0.0	0.9	0.6	0.8	0.0	5.9	62	50	9.41	8.53		262	314	1048	314	1048	314	314
6			0.0	0.0	0.0		0.0	59	60				167	200	668	200	400	200	67
7								57	93				76	91	302	91	182	91	30
8								51	92				11	13	44	13	26	13	4
9								48	93				0	0	1	0	0	0	0
10								45	93						0				
11								45	93										
M/N								44	93	1.16	1.03								

38 to 67°F = 4 to 20°C.

PERENNIAL RYEGRASS DAY 11 (11.12.68)

	Av. Number Florets Open/Head							Temp °F	RH %	Wind Speed		Rain	Light Units (treatments)						
	1	2	3	4	5	6	7			Tr. 3&5	Tr. 4&7		1	2	3	4	5	6	7
M/N								44	93	1.16	1.03								
1								42	94										
2								43	95										
3								43	95										
4								43	95				0	0	0	0	0	0	0
5								44	95				2	3	9	3	5	3	1
6								49	95				35	42	141	42	84	42	14
7								54	82				125	150	499	150	300	150	50
8								60	70				143	172	573	172	344	172	57
9								58	56	3.36	3.14		242	290	966	290	966	290	290
10								59	63	3.12	3.09		180	719	719	216	719	719	216
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	68	54	4.36	4.29		352	1408	1408	422	1408	1408	422
M/D	3.2	2.3	4.5	5.1	2.2	2.1	2.7	67	47	5.29	5.18	Nil	413	1650	1650	495	1650	1650	495
1	3.5	3.4	5.0	4.9	4.0	3.0	5.3	63	47	4.41	4.38		453	1812	1812	544	1812	1812	544
2	3.2	3.1	3.9	3.5	4.4	3.7	7.2	65	46	3.16	3.15		476	1902	1902	571	1902	1902	571
3	1.0	1.9	2.3	2.0	1.9	0.9	3.4	65	45	4.37	4.37		365	1461	1461	438	1461	1461	438
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	65	43	6.74	6.69		349	1394	1394	418	1394	1394	418
5								62	45	6.93	6.84		269	323	1076	323	1076	323	323
6								60	50				115	144	481	144	288	144	48
7								56	59				59	71	236	71	142	71	24
8								55	78				5	6	20	6	12	6	2
9								54	82				1	2	5	2	4	2	1
10								53	88				1	2	5	2	4	2	1
11								53	92				1	1	4	1	2	1	0
M/N								51	96	1.79	1.74		1	1	4	1	2	1	0

42 to 68°F = 6 to 20°C.

PERENNIAL RYEGRASS DAY 12 (12.12.68)

	Av. Number Florets Open/Head							Temp °F	RH %	Wind Speed		Rain	Light Units (treatments)						
	1	2	3	4	5	6	7			Tr. 38.5	Tr. 48.7		1	2	3	4	5	6	7
M/N								51	96	1.79	1.74		1	1	4	1	2	1	0
1								50	97				1	1	3	1	2	1	0
2								50	95				1	1	3	1	2	1	0
3								50	95				1	1	4	1	2	1	0
4								50	91				1	2	5	2	3	2	0
5								51	87				3	4	12	4	7	4	1
6								53	85				19	23	76	23	46	23	5
7								56	78				45	53	178	53	107	53	11
8		0.0						62	53				235	282	941	282	941	282	94
9		0.2			0.0	0.0	0.0	66	55	3.17	2.84		338	405	1351	405	1351	405	405
10	0.0	0.4	0.0	0.0	0.9	0.7	0.1	63	61	3.41	2.97		261	1043	1043	313	1043	1043	313
11	1.6	2.9	6.8	3.1	6.0	4.3	3.6	60	63	1.32	1.09		214	857	857	257	857	857	257
M/D	3.7	4.7	10.7	3.5	7.3	5.3	5.2	65	57	3.26	2.76	Nil	276	1093	1093	328	1093	1093	328
1	3.6	4.7	8.3	3.0	4.8	3.5	3.9	66	54	0.84	0.77		239	954	954	286	954	954	286
2	0.8	1.8	1.4	0.5	2.0	0.0	1.9	69	53	4.37	3.81		263	1052	1052	316	1052	1052	316
3	0.0	0.0	0.0	0.0	0.0		0.0	68	50	3.68	3.17		296	1185	1185	356	1185	1185	356
4								69	50	4.21	3.92		349	1396	1396	419	1396	1396	419
5								69	47	3.82	3.51		275	329	1098	329	1098	329	329
6								63	53				174	208	694	208	416	208	69
7								58	60				81	97	324	97	194	97	32
8								54	77				12	15	49	15	29	15	5
9								53	84				1	1	4	1	3	1	1
10								52	86				0	0	1	0	0	0	0
11								51	88						0				
M/N								51	90	2.47	2.22								

50 to 69°F = 10 to 21°C.

CORRELATION MATRIX, PERENNIAL RYEGRASS

Key to Correlation Matrix

1. Day number.
2. Treatment number.
3. Number flowers open at peak anthesis.
4. % flowers open peak anthesis.
5. Number flowers open peak anthesis previous day.
6. Time of onset daily anthesis.
7. Duration daily anthesis.
8. Av. length of time individual florets open.
9. Time of peak anthesis.
- 10-12. Temperature, day of anthesis, max. min. mean.
- 13-15. Temperature night prior to anthesis, max. min. mean.
- 16-18. Temperature previous day, max. min. mean.
- 19-21. Temperature night 36 hours prior to anthesis, max. min. mean.
- 22-24. Humidity, day of anthesis, max. min. mean.
- 25-27. Humidity, night prior to anthesis, max. min. mean.
- 28-30. Humidity previous day, max. min. mean.
- 31-33. Humidity night 36 hours prior to anthesis, max. min. mean.
34. Rainfall, total on day of anthesis.
- 35-37. Windspeed (av.) day of anthesis, max. min. mean.
38. Windspeed (av.) night prior to anthesis, mean.
- 39-41. Light units, day of anthesis, max. min. mean.
- 42-44. Light units, previous day, max. min. mean.

OVER

APPENDIX 26 CORRELATION MATRIX PERENNIAL RYEGRASS

41 42 43 44

41 2 n+05
42 2 n+05 4 n+05
43 5 200 76474 34686
44 1 n+05 2 n+05 5715 2 n+15

PERENNIAL RYEGRASS

CORRELATION MATRIX

	1	2	3	4	5	6	7	8	9	10	11
1	1.00										
2	-.36	1.00									
3	-.11	-.03	1.00								
4	-.12	-.03	-.06	1.00							
5	-.37	-.12	-.17	0.34**	1.00						
6	-.19	-.09	0.42**	0.32	0.44**	1.00					
7	-.31	-.15	0.13	0.34**	0.28	0.19	1.00				
8	-.35	-.05	0.13	0.14	0.45**	0.47**	0.36**	1.00			
9	-.27	-.11	0.23	0.14	0.35	0.31	0.24	0.16	1.00		
10	-.14	0.02	0.47**	0.05	-0.16	0.15	0.53**	-0.04	-0.48**	1.00	
11	-.16	0.05	0.38**	0.13	-0.12	0.04	0.42**	0.16	-0.44**	0.53	1.00
12	-.73	-.01	0.05	-0.11	-0.27**	-0.19	-0.54**	-0.41**	-0.51**	0.81	0.61
13	-.21	0.01	0.12	-0.25	-0.16**	-0.38**	0.54**	-0.48**	-0.71**	0.19	0.47
14	-.43	0.01	0.01	-0.24	-0.66**	-0.40**	0.57**	-0.52**	-0.75**	0.31	0.52
15	-.14	0.05	0.25**	0.02	0.27	0.10	0.42**	-0.27**	-0.33**	0.46	0.44
16	-.3	0.07	0.38**	0.22	-0.17	-0.27**	0.57**	-0.41**	-0.54**	0.38	0.35
17	-.21	0.01	0.42**	0.09	0.21	-0.00	0.55**	-0.36**	-0.42**	0.48	0.47
18	-.43	0.00	0.07	-0.24	-0.28**	-0.36**	0.21	-0.53**	-0.47**	0.11	-0.24
19	-.6	0.01	0.31**	0.18	-0.27**	-0.54**	0.02	-0.38**	-0.34**	0.04	-0.47
20	-.64	0.00	0.32**	0.22	-0.66**	-0.59**	0.03	-0.50**	-0.36**	-0.05	-0.35
21	-.55	0.01	0.61**	0.11	-0.51**	-0.37**	0.01	-0.35**	-0.34**	-0.13	-0.31
22	-.16	0.02	0.29**	0.18	-0.55**	-0.34**	0.22	-0.37**	-0.47**	-0.04	-0.23
23	-.41	0.01	0.39**	0.20	-0.64**	-0.47**	0.21	-0.43**	-0.55**	0.00	-0.21
24	-.61	0.02	0.05	0.11	-0.22	-0.24	-0.29	-0.12	-0.38**	0.46	0.60
25	-.46	0.00	0.14	0.11	-0.59**	-0.33**	0.23	-0.24	-0.46**	0.14	-0.19
26	-.51	0.00	0.03	0.11	-0.37**	-0.27**	0.40**	-0.32**	-0.54**	0.21	0.01
27	-.37	0.02	0.53**	0.06	-0.47**	-0.44**	0.13	-0.17	-0.27**	-0.15	-0.48
28	-.41	0.01	0.57**	0.15	-0.62**	-0.49**	0.19	-0.19	-0.19	-0.25	-0.30
29	-.46	0.01	0.63**	0.16	-0.56**	-0.53**	0.19	-0.30**	-0.25**	-0.23	-0.48
30	-.52	0.01	0.23	0.14	0.18	-0.12	-0.19	0.02	-0.36**	0.74	0.37
31	-.56	0.01	0.57**	0.26	-0.54**	-0.71**	0.19	-0.38**	-0.35**	0.03	-0.2
32	-.55	0.01	0.57**	0.28	-0.48**	-0.73**	0.15	-0.32**	-0.48**	0.21	-0.27
33	-.19	0.11	0.14	0.16	-0.63**	-0.16	-0.15	-0.32	-0.29	0.12	-0.01
34	-.16	0.35	0.17	0.16	0.27**	0.44**	-0.02	0.00	0.36**	-0.06	0.0
35	-.11	0.29	0.11	0.19	0.18	0.32**	-0.15	-0.09	0.01	-0.27	-0.0
36	-.14	0.37	0.18	0.15	0.17	0.35**	-0.12	0.00	0.24	-0.11	0.0
37	-.3	0.22	0.11	0.11	0.25**	0.29**	-0.14	-0.18	0.27	-0.06	-0.0
38	-.3	0.03	0.14	0.03	0.23	0.09	0.02	0.13	0.13	-0.03	0.1
39	-.11	0.11	0.19	0.00	0.27**	0.16	0.02	0.22	0.22	0.05	0.1
40	-.3	0.01	0.18	0.02	0.26**	0.14	-0.03	0.16	0.14	0.02	0.7
41	-.12	0.0	0.27**	0.14	0.28**	0.03	-0.16	-0.06	-0.01	0.02	0.0
42	-.19	0.11	0.25**	0.19	0.43**	0.39**	-0.25	0.08	0.09	0.09	0.30
43	-.13	0.02	0.33**	0.05	0.65**	0.10	-0.26	-0.09	-0.03	0.10	0.7

	12	13	14	15	16	17	18	19	20	21	22
1	1.48	1.54	1.55	1.53	1.42	1.60	1.60	1.60	1.60	1.60	1.60
2	1.54	1.72	1.95	1.53	0.42	0.74	0.41	0.41	0.96	0.60	0.73
3	1.72	1.58	0.21	0.53	0.87	0.74	0.41	0.13	0.53	0.58	0.80
4	1.58	1.31	0.45	0.46	0.15	0.53	0.13	0.13	0.60	0.71	0.80
5	1.42	1.48	0.23	0.28	0.04	0.54	0.15	0.15	0.68	0.09	0.80
6	1.57	1.33	0.39	0.46	0.04	0.54	0.15	0.15	0.68	0.09	0.80
7	1.44	1.33	0.42	0.46	0.04	0.54	0.15	0.15	0.68	0.09	0.80
8	1.12	1.23	0.47	0.51	0.17	0.54	0.15	0.15	0.68	0.09	0.80
9	1.15	1.27	0.53	0.54	0.11	0.54	0.15	0.15	0.68	0.09	0.80
10	1.07	1.32	0.65	0.67	0.32	0.54	0.15	0.15	0.68	0.09	0.80
11	1.67	1.32	0.55	0.45	0.35	0.54	0.15	0.15	0.68	0.09	0.80
12	1.61	1.28	0.43	0.48	0.12	0.54	0.15	0.15	0.68	0.09	0.80
13	1.12	1.47	0.54	0.62	0.35	0.54	0.15	0.15	0.68	0.09	0.80
14	1.33	1.41	0.52	0.53	0.46	0.54	0.15	0.15	0.68	0.09	0.80
15	1.29	1.12	0.53	0.53	0.23	0.54	0.15	0.15	0.68	0.09	0.80
16	1.38	1.09	0.53	0.53	0.45	0.54	0.15	0.15	0.68	0.09	0.80
17	1.68	1.44	0.42	0.46	0.13	0.54	0.15	0.15	0.68	0.09	0.80
18	1.09	1.26	0.39	0.45	0.12	0.54	0.15	0.15	0.68	0.09	0.80
19	1.09	1.26	0.42	0.45	0.12	0.54	0.15	0.15	0.68	0.09	0.80
20	1.09	1.26	0.42	0.45	0.12	0.54	0.15	0.15	0.68	0.09	0.80
21	1.09	1.26	0.42	0.45	0.12	0.54	0.15	0.15	0.68	0.09	0.80
22	1.09	1.26	0.42	0.45	0.12	0.54	0.15	0.15	0.68	0.09	0.80

	23	24	25	26	27	28	29	30	31	32	33
23	1.00										
24	.94	1.00									
25	-.19	-.02	1.00								
26	.63	.75	-.09	1.00							
27	.58	.71	.04	.96	1.00						
28	.53	.69	-.19	.69	.57	1.00					
29	.39	.58	.07	.49	.37	.38	1.00				
30	.56	.72	-.04	.59	.47	.93	.95	1.00			
31	-.23	-.06	.43	.34	.43	.34	-.12	-.09	1.00		
32	.41	.57	-.34	.22	.16	.58	.7	.75	.05	1.00	
33	.21	.41	.42	.25	.20	.51	.62	.64	.31	.93	1.00
34	.61	.59	.02	.36	.34	.32	.28	.33	-.09	.24	.10
35	-.24	-.27	-.10	-.26	-.24	-.15	-.11	-.15	-.20	-.23	-.26
36	-.15	-.15	-.15	-.02	.02	-.03	-.01	-.05	-.19	-.27	-.26
37	-.19	-.21	-.07	-.16	-.13	-.10	-.05	-.10	-.17	-.20	-.21
38	-.24	-.21	-.19	-.12	-.13	-.11	-.05	-.02	-.00	-.04	-.05
39	-.49	-.44	.16	-.21	-.17	-.25	-.17	-.25	.14	-.27	-.16
40	-.49	-.51	.23	-.44	-.44	-.32	-.18	-.30	.01	-.16	-.06
41	-.56	-.52	.23	-.32	-.27	-.36	-.23	-.37	.14	-.30	-.20
42	-.23	-.30	.12	-.27	-.21	-.43	-.42	-.42	.05	-.26	-.21
43	-.41	-.45	.15	-.33	-.22	-.41	-.43	-.46	.13	-.43	-.37
44	-.34	-.36	.23	-.27	-.17	-.50	-.49	-.50	.18	-.31	-.22

	34	35	36	37	38	39	40	41	42	43	44
34	1.00										
35	-.19	1.00									
36	-.21	.83	1.00								
37	-.21	.96	.92	1.00							
38	-.16	.56	.32	.54	1.00						
39	-.23	.05	.05	.03	.11	1.00					
40	-.23	.41	.22	.35	.42	.53	1.00				
41	-.25	.17	.13	.15	.19	.26	.75	1.00			
42	-.19	.01	-.02	.01	.05	.73	.57	.74	1.00		
43	-.21	.41	.31	.37	.60	.56	.75	.66	.65	1.00	
44	-.19	.11	.19	.10	.19	.74	.64	.78	.95	.75	1.00

END OF RUN

APPENDIX 27

DAILY ANTHESIS DATA

PRAIRIE GRASS DAY 1 (11.11.68)

	Av. % Florets Open							Temp F	RH %	Wind Speed		Rain	Light Units (Treatments)						
	1	2	3	4	5	6	7			Tr. 3&5	Tr. 4&7		1	2	3	4	5	6	7
M/N								52	94	1.73	1.56								
1								52	97										
2								50	97										
3								48	98										
4								48	99										
5	0.0		0.0	0.0	0.0	0.0		50	99	0.76	0.62		0	0	0	0	0	0	0
6	20.6		31.2	8.5	4.5	8.8		52	99	0.86	0.80		8	9	30	9	18	9	3
7	8.8		35.6	8.5	13.5	9.0	0.0	54	92	1.12	1.02		25	30	99	30	99	30	30
8	5.9		42.2	12.0	15.2	12.6	1.4	55	81	1.76	1.57		62	74	247	74	247	74	74
9	5.9		46.7	17.2	18.2	18.0	5.5	58	71	2.36	2.21	Nil	133	159	531	159	531	159	159
10	11.8	0.0	44.5	27.6	30.3	23.5	23.3	59	66	2.74	2.59		195	781	781	234	781	781	234
11	32.4	41.6	53.4	29.8	45.5	47.0	42.5	62	64	2.31	2.22		217	869	869	261	869	869	261
M/D	55.9	33.3	51.2	34.0	68.2	73.5	54.8	62	62	2.37	2.32		184	735	735	221	735	735	221
1	20.6	75.0	42.2	42.5	72.8	61.8	67.9	63	63	2.96	2.91		211	842	842	253	842	842	253
2	62.6	75.0	24.4	42.5	72.3	44.1	78.9	63	62	2.09	2.00		194	777	777	233	777	777	233
3	52.9	50.0	22.2	41.7	74.3	35.2	70.6	61	65	2.73	2.64		169	678	678	203	678	678	203
4	32.4	33.3	11.1	53.2	57.5	17.6	59.6	61	67	2.64	2.59		158	633	633	190	633	633	190
5	14.7	25.0	4.4	48.9	24.2	8.8	46.6	57	67	1.62	1.37		74	88	294	88	294	88	88
6	0.0	0.0	0.0	6.4	3.0	2.9	0.0	55	70	1.66	1.59		28	34	113	34	68	34	11
7				0.0	0.0	0.0		53	76				10	12	40	12	24	12	4
8								53	74				0	0	1	0	0	0	0
9								53	78						0				
10								52	84										
11								52	92										
M/N								52	94	2.20	2.00								

48 to 63°F = 9 to 17°C.

PRAIRIE GRASS DAY 2 (12.11.68)

	Av. % Florets Open							Temp °F	RH %	Wind Speed		Rain	Light Units (Treatments)						
	1	2	3	4	5	6	7			Tr. 3&5	Tr. 4&7		1	2	3	4	5	6	7
M/N								52	94	2.20	2.00								
1								52	95										
2								51	95										
3								51	95										
4								52	95										
5			0	0	0	0	0	51	95	4.07	4.10		0	0	0	0	0	0	0
6			1.5	10.7	3.1	2.5	0.7	52	94	4.36	4.27		15	18	61	18	36	18	6
7	0		1.5	15.6	5.1	1.3	2.7	54	77	4.19	4.11		54	65	215	65	215	65	65
8	1.1	0	3.2	21.4	8.3	2.5	4.7	56	59	6.12	6.02		107	128	426	128	426	128	128
9	4.5	17.2	28.4	30.1	31.2	23.8	14.9	58	54	3.01	2.94		188	226	753	226	753	226	226
10	32.6	55.1	57.9	37.9	65.7	55.0	48.0	63	58	2.02	2.01	NIL	331	1322	1322	397	1322	1322	397
11	71.9	89.6	94.8	58.3	77.1	75.0	70.3	63	51	2.02	1.97		376	1505	1505	452	1505	1505	452
M/D	84.3	75.9	77.9	56.4	68.8	67.5	74.3	67	45	0.21	0.11		381	1524	1524	457	1524	1524	457
1	84.1	43.3	45.3	48.5	46.8	52.5	59.5	62	46	0.30	0.17		417	1666	1666	500	1666	1666	500
2	69.7	24.2	14.7	36.9	28.2	27.5	48.7	68	46	0.21	0.13		386	1543	1543	463	1543	1543	463
3	50.6	10.3	4.2	16.5	12.5	16.3	30.4	65	47	0.12	0.10		356	1525	1525	458	1525	1525	458
4	15.7	6.9	2.1	10.7	9.4	12.5	22.3	70	50	0.07	0.03		177	709	709	213	709	709	213
5	0	0	0	0	0	0	0.7	63	49	0.30	0.19		78	93	311	93	311	93	93
6							0	63	54	0.12	0.09		82	98	326	98	196	98	33
7								56	60				36	43	144	43	86	43	14
8								50	77				1	1	2	1	1	1	0
9								50	84				0	0	0	0	0	0	
10								49	88										
11								44	93										
M/N								45	93	1.81	1.51								

44 to 70°F = 7 to 21°C.

PRAIRIE GRASS DAY 3 (13.11.68)

	Av. % Florets Open							Temp °F	RH %	Wind Speed		Rain	Light Units (Treatments)						
	1	2	3	4	5	6	7			Tr. 3&5	Tr. 4&7		1	2	3	4	5	6	7
4/N								45	93	1.81	1.51								
1								42	94										
2								41	96										
3								40	96										
4								42	97										
5	0			0	0	0	0	42	97	1.81	1.73		0	0	0	0	0	0	0
6	4.9	0	0	5.7	5.1	1.5	10.1	46	97	1.99	1.86		24	29	97	29	58	29	10
7	25.2	11.7	1.2	16.1	21.2	4.4	12.6	52	78	1.45	1.37		128	153	511	153	511	153	153
8	54.5	42.4	30.6	42.9	60.6	35.3	68.3	56	65	2.17	2.02		200	240	800	240	800	240	240
9	66.7	73.0	70.6	91.5	89.8	95.6	70.4	63	66	2.12	2.02	Nil	238	283	944	283	944	283	283
10	79.7	61.0	80.0	93.5	89.8	73.2	72.3	65	68	2.76	2.57		331	1325	1325	398	1325	1325	398
11	72.1	33.7	63.6	80.7	73.4	61.8	70.3	66	64	3.81	3.72		246	983	983	295	983	983	295
4/D	48.8	5.1	40.0	60.4	43.8	5.9	37.8	64	64	3.26	3.14		363	1453	1453	436	1453	1453	436
1	5.7	0	4.7	3.8	8.4	0	18.9	70	65	2.19	2.11		370	1479	1479	444	1479	1479	444
2	3.3		0	0	0.7			65	65	4.91	4.79		286	1145	1145	344	1145	1145	344
3	3.4				0		2.7	65	63	3.96	3.91		255	1018	1018	305	1018	1018	305
4	3.3						0.7	64	67	4.13	4.03		206	822	822	247	822	822	247
5	2.4							62	70	6.82	6.70		105	126	421	126	421	126	126
6	0							61	78	6.24	6.19		46	55	183	55	110	55	18
7								52	94				12	14	48	14	29	14	5
8								55	96				0	0	0	0	0	0	0
9								53	100										
10								52	99										
11								51	99										
4/H								50	99	0.70	0.57								

40 to 70°F = 5 to 21°C

PRAIRIE GRASS DAY 4 (14.11.68)

	Av. % Florets Open							Temp °F	RH %	Wind Speed		Rain	Light Units (Treatments)						
	1	2	3	4	5	6	7			Tr. 3&5	Tr. 4&7		1	2	3	4	5	6	7
H/N								50	98	0.70	0.57								
1								49	98										
2								47	98										
3								46	98										
4								45	98										
5	0	0	0	0	0	0	0	46	98	1.70	1.57		0	0	0	0	0	0	0
6	17.2	17.5	12.0	3.8	13.0	39.2	43.3	48	98	1.71	1.63		18	21	70	21	42	21	7
7	45.2	63.1	70.7	57.6	47.8	92.4	73.0	55	92	1.40	1.32		69	83	277	83	277	83	82
8	69.9	84.1	89.4	88.4	87.0	93.5	97.4	61	76	1.90	1.82	Nil	134	161	535	161	535	161	161
9	64.5	72.0	86.6	92.2	87.2	78.4	83.8	66	71	2.63	2.51		281	338	1125	338	1125	338	338
10	54.8	29.8	61.4	73.0	71.8	29.8	54.0	71	55	1.69	1.53		344	1377	1377	413	1377	1377	413
11	29.0	0	12.0	15.4	39.1	4.1	10.4	72	53	2.12	2.07		399	1596	1596	479	1596	1596	479
M/D	11.8		4.0	3.8	10.9	0	2.7	71	55	2.36	2.28		439	1755	1755	527	1755	1755	527
1	0		0	0	0		0	70	46	4.36	4.23		403	1610	1610	483	1610	1610	483
2								71	49	4.31	4.19		408	1632	1632	490	1632	1632	490
3								69	58	5.37	5.22		376	1502	1502	451	1502	1502	451
4								68	56	5.29	5.19		299	1197	1197	359	1197	1197	359
5								68	58	6.24	6.20		215	258	860	258	860	258	258
6								63	57	5.23	5.18		103	124	413	124	248	124	41
7								57	83				36	43	144	43	86	43	14
8								53	97				1	1	2	1	1	1	0
9								51	97				0	0	0	0	0	0	0
10								50	98										
11								48	98										
M/N								47	98	1.72	1.57								

45 to 72°F = 7 to 22°C.

PRAIRIE GRASS DAY 5 (15.11.68)

	Av. % Florets Open							Temp °F	RH %	Wind Speed		Rain	Light Units (Treatments)						
	1	2	3	4	5	6	7			Tr. 3&5	Tr. 4&7		1	2	3	4	5	6	7
M/N								47	99	1.72	1.57								
1								48	99										
2								50	98										
3								51	98										
4	0		0	0			0	51	98										
5	2.7	0	10.2	21.7	0	0	9.8	53	98				0	0	0	0	0	0	0
6	43.7	14.8	45.3	64.9	8.7	30.8	64.5	56	95	1.83	1.77		12	14	48	14	28	14	5
7	45.5	22.2	51.5	67.5	15.2	43.0	71.0	59	87	4.24	4.16		48	58	192	58	192	58	58
8	52.7	44.4	54.9	70.3	9.2	43.0	74.2	63	77	6.89	6.53		113	135	450	135	450	135	135
9	52.7	55.5	54.9	62.1	9.2	44.6	71.0	63	71	4.16	4.11		155	185	618	185	618	185	185
10	47.3	66.6	54.9	43.2	46.7	38.5	25.8	65	56	5.34	5.21		281	1123	1123	337	1123	1123	337
11	41.8	66.6	51.5	16.2	56.5	40.0	12.8	66	52	6.62	6.48		350	1400	1400	420	1400	1400	420
M/D	40.0	59.3	48.4	18.9	58.7	43.0	19.4	67	47	7.21	7.09	Nil	419	1675	1675	503	1675	1675	503
1	30.9	33.4	25.8	8.1	63.0	32.4	12.8	66	51	10.87	9.99		416	1665	1665	500	1665	1665	500
2	20.0	25.9	19.3	13.5	56.5	22.7	9.7	65	54	13.21	12.73		431	1724	1724	517	1724	1724	517
3	9.1	7.4	3.2	10.8	30.4	3.1	3.2	63	55	11.48	10.96		383	1526	1526	458	1526	1526	458
4	3.6	0	0	10.8	6.5	0	0	63	56	8.68	8.41		297	1189	1189	357	1189	1189	357
5	0			0	0			62	56	5.73	5.63		205	246	821	246	821	246	246
6								57	50	1.83	1.77		147	177	589	177	353	177	59
7								54	62				40	47	158	47	95	47	16
8								54	88				1	1	4	1	2	1	0
9								52	95				0	0	0	0	0	0	0
10								52	98										
11								55	99										
M/N								55	99	3.44	3.17								

47 to 67°F = 9 to 20°C.

PRAIRIE GRASS DAY 6 (16.11.68)

	Av. % Florets Open							Temp °F	RH %	Wind Speed		Rain	Light Units (Treatments)						
	1	2	3	4	5	6	7			Tr. 3&5	Tr. 4&7		1	2	3	4	5	6	7
M/N								57	99	3.44	3.17								
1								56	93										
2								53	95										
3								52	87			0.02							
4	0		0	0			0	51	99										
5	8.2	0	1.7	12.6	0	0	7.6	48	97	0.26	0.24		0	0	0	0	0	0	0
6	56.9	28.1	44.4	55.0	14.3	28.2	60.3	47	90	0.37	0.26		12	15	49	15	30	15	5
7	47.0	41.3	67.8	56.9	42.9	44.8	60.3	56	87	3.67	3.39		115	138	461	138	461	138	138
8	62.8	65.2	82.2	49.0	61.2	64.6	25.0	64	74	4.73	4.48		229	275	915	275	915	275	275
9	47.1	67.4	80.0	47.1	70.4	68.8	20.6	64	54	6.19	5.93	0.02	244	293	977	293	977	293	293
10	31.4	47.8	68.9	25.6	73.4	58.3	17.7	59	95	5.80	5.73	0.03	217	260	866	260	520	866	87
11	7.9	6.5	0	9.8	30.6	4.2	13.3	59	66	6.36	5.86		234	936	936	281	936	936	281
M/D	0	0		6.5	7.8	0	4.7	64	60	7.19	6.62		393	1570	1570	471	1570	1570	471
1				6.1	0		0	65	54	8.63	7.46	Trace	382	1528	1528	458	1528	1528	458
2				2.0				66	49	9.93	8.74	0.01	445	1778	1778	533	1778	1778	533
3				0				64	46	10.64	9.69		381	1522	1522	457	1522	1522	457
4								64	76	14.23	13.26		305	1220	1220	366	1220	1220	366
5								58	52	12.12	11.31	Trace	211	253	842	253	842	253	253
6								55	68	12.39	11.63		98	118	393	118	236	118	39
7								54	68			0.01	37	44	148	44	89	44	15
8								54	84				1	1	4	1	2	1	0
9								54	87				0	0	0	0	0	0	0
10								54	85										
11								52	83										
M/N								52	86										

47 to 66°F = 9 to 19°C

CORRELATION MATRIX, PRAIRIE GRASS

Key to Correlation Matrix

1. Day number.
2. Treatment number.
3. Number of flowers open at peak anthesis.
4. Percentage flowers open at peak anthesis.
5. Number flowers open peak anthesis previous day.
6. Time of onset daily anthesis.
7. Duration daily anthesis.
8. Av. length of time individual florets open.
9. Time of peak anthesis.
- 10-12. Temperature day of anthesis, max. min. mean.
- 13-15. Temperature night prior to anthesis max. min. mean.
- 16-18. Temperature previous day, max. min. mean.
- 19-21. Temperature night 36 hours prior to anthesis, max. min. mean.
- 22-24. Humidity day of anthesis, max. min. mean.
- 25-27. Humidity night prior to anthesis, max. min. mean.
- 28-30. Humidity previous day, max. min. mean.
- 31-33. Humidity night 36 hours prior to anthesis, max. min. mean.
34. Rainfall, total on day of anthesis.
- 35-37. Windspeed (av.) day of anthesis, max. min. mean.
38. Windspeed (av.) night prior to anthesis, mean.
- 39-41. Light units day of anthesis, max. min. mean.
- 42-44. Light units previous day, max. min. mean.

OVER

APPENDIX 28 CORRELATION MATRIX

PRAIRIE GRASS

41 42 43 44

PRAIRIE GRASS

41 1 $\times 10^5$
 42 2 $\times 10^5$ 4 $\times 10^5$
 43 21172 26664 9120.2
 44 1 $\times 10^5$ 2 $\times 10^5$ 1971 1 $\times 10^5$

CORRELATION MATRIX

	1	2	3	4	5	6	7	8	9	10	11
1	1.00										
2	0.00	1.00									
3	-0.20	0.26	1.00								
4	-0.18	0.09	0.44	1.00							
5	-0.09	0.32	0.40	0.26	1.00						
6	-0.42	-0.19	0.23	0.42	0.12	1.00					
7	-0.42	0.13	-0.14	-0.46	-0.13	-0.36	1.00				
8	-0.40	-0.16	-0.05	-0.24	-0.08	-0.15	0.65	1.00			
9	-0.74	0.11	0.15	-0.05	0.03	0.30	0.55	0.48	1.00		
10	-0.10	-0.20	0.23	0.27	0.36	-0.02	-0.11	-0.05	-0.10	1.00	
11	-0.29	0.00	-0.44	-0.43	-0.33	-0.17	0.72	0.46	0.44	-0.26	1.00
12	0.11	-0.12	0.05	0.16	0.35	-0.12	-0.02	-0.08	-0.19	0.88	0.02
13	0.83	0.02	0.04	0.03	0.17	-0.26	-0.53	-0.38	-0.66	0.29	-0.66
14	-0.20	0.00	-0.24	-0.25	-0.39	-0.09	0.48	0.21	0.28	-0.14	0.85
15	0.49	0.01	-0.30	-0.28	-0.43	-0.29	0.0	-0.21	-0.31	-0.11	0.44
16	0.54	-0.17	-0.07	-0.11	0.26	-0.23	-0.11	0.01	-0.39	0.47	-0.34
17	-0.16	0.00	0.37	-0.12	-0.42	0.18	0.13	0.15	0.23	-0.26	-0.05
18	.53	-0.08	-0.04	-0.26	0.09	-0.27	0.03	0.09	-0.26	0.21	-0.29
19	.80	0.01	-0.33	-0.12	0.08	-0.37	-0.42	-0.41	-0.63	0.04	-0.15
20	0.02	-0.00	0.47	0.03	-0.16	0.13	-0.01	0.09	0.05	0.03	-0.40
21	0.09	-0.01	0.14	-0.35	-0.33	-0.03	0.22	0.27	0.13	-0.33	-0.12
22	0.00	0.00	-0.42	-0.20	0.20	-0.11	0.03	0.10	0.04	-0.29	0.10
23	-0.53	-0.00	0.19	0.02	0.13	0.30	0.09	0.23	0.41	-0.33	-0.20
24	-0.12	-0.00	-0.03	-0.06	0.14	0.12	-0.11	0.01	0.09	-0.38	-0.30
25	0.45	0.00	-0.49	-0.28	0.07	-0.28	-0.15	-0.12	-0.30	-0.26	0.00
26	-0.75	-0.00	0.15	0.11	0.15	0.23	0.31	0.23	0.52	-0.13	0.40
27	0.00	0.00	-0.51	-0.06	0.23	-0.18	0.07	-0.00	-0.03	0.02	0.41
28	0.30	-0.00	-0.19	-0.18	-0.33	-0.28	0.22	-0.01	-0.14	0.13	0.56
29	-0.33	0.01	0.10	0.42	0.19	0.15	-0.04	-0.15	0.06	0.40	0.20
30	-0.13	0.02	-0.15	0.08	-0.01	-0.07	0.17	-0.07	0.03	0.23	0.50
31	0.39	-0.00	-0.35	-0.41	-0.44	-0.37	0.32	0.07	-0.13	-0.07	0.60
32	-0.49	-0.00	0.11	-0.12	-0.21	0.07	0.64	0.50	0.53	0.05	0.51
33	0.27	-0.00	-0.27	-0.54	-0.49	-0.34	0.54	0.34	0.08	-0.19	0.62
34	0.47	-0.08	-0.04	-0.18	-0.28	-0.15	-0.22	-0.24	-0.22	-0.18	-0.11
35	0.42	0.34	0.03	-0.08	-0.01	-0.24	0.05	0.04	-0.12	0.13	-0.00
36	0.14	0.00	-0.01	0.13	0.37	-0.09	0.02	0.14	-0.03	0.24	-0.17
37	0.44	0.32	-0.04	-0.12	-0.04	-0.25	0.04	0.06	-0.12	0.07	-0.02
38	0.22	0.34	0.27	-0.06	-0.02	-0.14	0.10	0.14	0.02	-0.05	-0.00
39	0.28	0.03	-0.02	0.19	-0.18	-0.08	-0.36	-0.22	-0.26	-0.29	-0.11
40	0.31	0.01	0.36	0.25	0.06	0.01	-0.39	-0.08	-0.17	0.04	-0.40
41	0.27	0.03	0.00	0.22	-0.10	-0.08	-0.35	-0.18	-0.23	-0.22	-0.12
42	0.15	0.03	-0.17	0.01	-0.16	-0.01	-0.30	-0.05	-0.11	-0.54	-0.00
43	0.22	0.05	0.01	0.23	0.35	-0.05	-0.28	-0.07	-0.13	0.13	-0.10
44	0.20	0.04	-0.15	0.00	-0.13	-0.05	-0.27	-0.02	-0.10	-0.40	-0.00

	12	13	14	15	16	17	18	19	20	21	22
12.	1.00										
13	0.15	1.00									
14	0.14	-0.66	1.00								
15	0.12	-0.05	0.73	1.00							
16	0.31	0.68	0.51	-0.15	1.00						
17	-0.41	-0.15	0.15	0.04	-0.28	1.00					
18	0.02	0.68	0.53	-0.19	0.88	-0.01	1.00				
19	0.11	0.57	0.18	0.44	0.47	-0.52	0.33	1.00			
20	-0.21	0.29	0.29	-0.30	0.06	0.32	0.29	-0.54	1.00		
21	-0.54	0.23	0.25	-0.23	0.14	0.74	0.50	-0.34	0.80	1.00	
22	-0.29	-0.02	0.29	-0.23	0.25	-0.55	0.22	0.49	-0.65	-0.20	1.00
23	-0.59	-0.23	0.53	-0.76	-0.04	0.21	0.12	-0.39	0.23	0.41	0.42
24	-0.60	0.06	0.62	-0.52	0.21	-0.10	0.30	0.14	-0.08	0.25	0.73
25	-0.22	0.26	0.22	0.16	0.37	-0.53	0.33	0.82	-0.65	-0.21	0.87
26	0.02	-0.82	0.37	-0.13	-0.46	-0.40	-0.60	-0.23	-0.67	-0.59	0.42
27	0.25	-0.19	0.20	0.17	0.06	-0.90	-0.16	0.54	-0.96	-0.74	0.71
28	0.41	-0.09	0.78	0.80	-0.17	0.09	-0.21	0.09	-0.08	-0.18	-0.53
29	0.62	-0.44	0.50	0.25	-0.39	-0.33	-0.70	-0.12	-0.45	-0.82	-0.30
30	0.54	-0.46	0.77	0.58	-0.36	-0.33	-0.60	0.06	-0.57	-0.74	-0.22
31	0.20	-0.09	0.79	0.87	-0.10	0.09	-0.07	0.23	-0.16	-0.05	-0.30
32	0.13	-0.43	0.47	-0.10	-0.32	0.48	-0.17	-0.79	0.45	0.33	-0.56
33	-0.04	-0.02	0.56	0.50	0.00	0.39	0.22	-0.09	0.27	0.48	-0.32
34	-0.21	0.21	0.08	0.47	0.09	0.25	0.15	0.36	0.08	0.17	-0.09
35	0.09	0.33	0.01	0.23	0.31	0.04	0.36	0.27	0.10	0.14	-0.05
36	0.15	0.32	0.37	-0.32	0.45	-0.34	0.41	0.19	-0.08	-0.05	0.29
37	0.02	0.34	0.05	0.22	0.34	-0.02	0.39	0.34	0.03	0.15	0.07
38	-0.13	0.11	0.07	0.22	0.08	0.28	0.17	0.06	0.20	0.25	-0.14
39	-0.14	0.24	0.01	0.15	-0.28	-0.03	-0.24	0.15	0.07	-0.04	-0.19
40	-0.10	0.36	0.28	-0.02	0.10	0.18	0.11	0.13	0.29	0.14	-0.18
41	-0.09	0.24	0.04	0.11	-0.22	-0.10	-0.21	0.16	0.02	-0.10	-0.15
42	-0.48	0.14	0.20	-0.08	-0.23	-0.11	-0.11	0.19	-0.06	0.10	0.29
43	0.18	0.26	0.23	-0.07	0.22	-0.47	0.06	0.37	-0.30	-0.37	0.26
44	-0.41	0.18	0.18	-0.05	-0.17	-0.12	-0.06	0.22	-0.06	0.10	0.27

	23	24	25	26	27	28	29	30	31	32	33
23	1.00										
24	0.84	1.00									
25	0.07	0.56	1.00								
26	0.24	0.15	0.11	1.00							
27	-0.20	0.10	0.67	0.63	1.00						
28	-0.89	-0.88	-0.26	-0.16	0.05	1.00					
29	-0.49	-0.60	-0.34	0.54	0.36	0.41	1.00				
30	-0.69	-0.69	-0.15	0.48	0.48	0.59	0.87	1.00			
31	-0.79	-0.67	-0.00	-0.16	0.13	0.93	0.17	0.57	1.00		
32	-0.08	-0.52	-0.75	0.05	-0.38	0.41	0.13	0.18	0.30	1.00	
33	-0.43	-0.47	-0.16	-0.37	-0.22	0.70	-0.27	0.11	0.81	0.59	1.00
34	-0.18	0.05	0.21	-0.36	-0.18	0.15	-0.25	-0.06	0.29	-0.33	0.17
35	-0.24	-0.16	0.14	-0.37	-0.07	0.17	-0.22	-0.10	0.25	-0.08	0.27
36	0.09	0.14	0.25	-0.08	0.19	-0.23	-0.13	-0.23	-0.22	-0.15	-0.12
37	-0.19	-0.07	0.25	-0.34	-0.00	0.12	-0.23	-0.14	0.24	-0.15	0.25
38	-0.08	-0.09	-0.00	-0.27	-0.24	0.10	-0.21	-0.12	0.19	-0.02	0.22
39	-0.30	-0.26	-0.04	-0.26	-0.06	0.23	0.05	0.04	0.15	-0.04	0.09
40	-0.03	-0.02	-0.02	-0.41	-0.31	-0.08	-0.13	-0.29	-0.11	-0.24	-0.11
41	-0.29	-0.26	-0.02	-0.22	-0.01	0.20	0.08	0.04	0.12	-0.06	0.04
42	0.15	0.25	0.31	-0.07	0.09	-0.18	-0.28	-0.27	-0.10	-0.23	-0.04
43	-0.13	0.03	0.31	0.02	0.34	-0.09	0.09	0.00	-0.12	-0.35	-0.27
44	0.09	0.20	0.31	-0.11	0.09	-0.13	-0.28	-0.26	-0.05	-0.21	0.00
	34	35	36	37	38	39	40	41	42	43	44
34	1.00										
35	0.15	1.00									
36	-0.18	0.63	1.00								
37	0.16	0.99	0.65	1.00							
38	0.20	0.86	0.36	0.83	1.00						
39	0.03	0.02	-0.04	0.01	0.03	1.00					
40	0.22	0.50	0.32	0.48	0.57	0.53	1.00				
41	0.02	0.12	0.07	0.11	0.11	0.98	0.62	1.00			
42	0.02	-0.03	0.05	0.02	0.02	0.60	0.45	0.79	1.00		
43	-0.08	0.40	0.59	0.42	0.25	0.47	0.62	0.61	0.47	1.00	
44	0.02	0.09	0.14	0.13	0.11	0.32	0.53	0.83	0.99	0.57	1.00

END OF RUN

APPENDIX 29

AVERAGE LENGTH OF TIME INDIVIDUAL FLORETS REMAINED
OPEN - PRAIRIE GRASS

Treatment	Time florets setting seed remained open (mean all days) (Mins.)	Time florets <u>not</u> setting seed remained open (mean all days) (Mins.)
1	206	190
2	175	150
3	212	174
4	194	220
5	201	203
6	151	155
7	163	189

Day	Time florets setting seed remained open (mean all treatments)	Time florets <u>not</u> setting seed remained open (mean all treatments)
1	234	236
2	203	201
3	176	186
4	143	139
5	207	201
6	146	128

APPENDIX 30

PERCENTAGE OF SEEDS DEVELOPED FROM FLORETS OPEN ON
DIFFERENT DAYS AND HARVESTED AT INTERVALS UP TO 30
DAYS AFTER ANTHESIS

PERENNIAL RYEGRASS

Treatment	Day of Anthesis	Harvest Date (Days after Anthesis)								
		4	7	10	14	18	21	24	28	30
1	1	5	8	5	0	3	0	0	0	0
2		68	63	70	73	65	60	60	63	65
3		15	28	30	28	25	33	38	38	40
4		8	18	33	30	40	60	55	60	65
5		20	25	30	28	33	30	38	35	45
6		10	20	18	20	25	40	45	36	40
7		20	28	43	55	53	45	60	58	58
Mean		20.9	27.1	32.7	33.4	34.9	38.3	42.3	41.4	44.7
1 to 7	2	Nil Anthesis								
1	3	18	10	28	23	20	33	33	35	33
2		70	68	65	63	58	65	73	78	83
3		70	68	55	55	48	25	25	28	25
4		83	88	73	70	55	43	40	45	38
5		73	75	70	70	70	73	65	63	58
6		20	28	25	25	30	35	40	35	40
7		75	63	68	65	65	58	48	40	35
Mean		57.0	57.1	54.9	53.0	49.4	47.3	46.3	46.3	44.6
1	4	40	28	33	23	28	23	23	20	23
2		83	73	65	63	58	28	30	30	23
3		15	18	28	30	38	50	50	53	50
4		90	90	93	90	93	85	90	88	90
5		88	70	75	83	73	68	65	60	58
6		10	5	8	20	30	33	50	55	60
7		5	13	43	68	60	65	70	73	75
Mean		45.9	42.4	48.9	53.9	54.3	50.3	54.0	54.3	54.2
1 to 7	5	Nil Anthesis								
1	6	30	23	28	23	20	23	20	23	23
2		13	13	18	30	70	68	68	75	70
3		20	18	20	20	18	13	18	15	18
4		25	28	23	13	10	13	13	18	13
5		30	33	28	10	8	10	15	13	15
6		25	25	30	5	5	5	3	8	5
7		65	65	60	20	15	10	13	18	13
Mean		28.3	29.3	29.6	17.3	20.9	20.3	21.4	24.3	23.9
1 to 7	7	Nil Anthesis								

OVER

APPENDIX 30 (Continued)

Treatment	Day of Anthesis	Harvest Date (Days after Anthesis)								
		4	7	10	14	18	21	24	28	30
1	8	48	40	35	50	45	48	50	53	50
2		73	53	55	50	40	45	43	35	40
3		5	23	28	43	53	50	50	48	53
4		23	15	28	33	30	43	43	38	48
5		28	30	40	30	40	43	48	55	60
6		58	45	28	15	20	18	18	23	20
7		25	30	35	38	45	50	58	53	58
Mean		37.3	33.7	35.6	37.0	39.0	42.4	44.3	43.6	47.0
1	9	18	40	50	70	73	80	68	70	68
2		15	25	20	25	65	68	60	70	75
3		0	8	18	28	45	45	50	43	48
4		25	28	28	28	28	25	33	25	35
5		23	25	25	25	20	23	18	20	23
6		65	70	68	63	65	63	68	63	68
7		38	43	25	18	10	15	13	18	18
Mean		26.3	34.1	33.4	36.7	43.7	45.6	44.3	44.1	47.9
1	10	55	53	45	33	38	38	18	18	13
2		33	28	23	25	23	20	23	10	20
3		15	18	15	15	13	20	30	43	38
4		68	65	63	75	75	65	68	63	55
5		50	55	58	30	13	18	5	15	18
6		73	75	70	75	98	95	95	88	90
7		68	68	73	78	53	58	45	33	28
Mean		51.7	51.7	49.6	47.3	44.7	44.9	40.6	38.6	37.4
1	11	28	50	58	58	65	70	70	90	88
2		43	23	5	0	10	5	3	0	0
3		28	30	13	18	15	18	15	8	10
4		0	5	18	33	40	43	55	53	50
5		15	10	3	8	5	0	0	0	0
6		43	40	45	48	55	58	60	68	65
7		43	45	38	45	53	53	58	65	68
Mean		28.6	29.0	25.7	30.0	34.7	35.3	37.3	40.5	40.1
1	12	75	78	68	63	55	50	53	43	48
2		78	70	45	18	15	10	8	10	10
3		0	8	28	20	28	35	45	58	55
4		33	43	10	18	25	28	28	33	40
5		23	30	15	20	18	23	23	25	35
6		78	75	68	78	48	50	43	35	28
7		30	43	45	43	45	33	43	40	45
Mean		45.3	49.6	39.9	37.1	33.4	32.7	33.4	34.9	37.3

OVER

APPENDIX 30 (Continued)

PRAIRIE GRASS

Treatment	Day of Anthesis	Harvest Date (Days after Anthesis)								
		4	7	10	14	18	21	24	28	30
1	1	88	82	83	68	78	78	70	58	75
2		95	96	93	95	100	98	98	100	95
3		88	90	90	88	78	95	93	88	90
4		75	79	78	85	80	78	75	73	90
5		90	90	93	95	83	80	85	90	88
6		78	80	78	68	73	68	80	90	93
7		70	74	75	90	88	80	95	98	100
Mean		83.4	84.4	84.3	84.1	82.9	82.4	85.1	85.3	90.1
1	2	68	70	73	78	95	93	83	70	80
2		70	79	78	95	98	95	93	100	95
3		98	97	100	100	98	98	100	98	100
4		93	94	93	100	93	93	93	90	98
5		93	94	98	95	95	90	93	95	98
6		75	77	85	83	90	93	93	95	93
7		75	78	80	83	90	78	85	88	93
Mean		81.7	84.1	86.7	90.6	94.1	91.4	91.4	90.9	93.9
1	3	85	84	83	65	83	85	80	88	75
2		78	77	75	73	75	73	75	88	80
3		80	81	75	78	80	88	83	85	83
4		95	92	93	93	98	90	95	90	98
5		93	94	95	93	88	78	85	93	98
6		78	85	85	88	90	88	88	93	88
7		93	96	98	95	95	90	100	100	98
Mean		86.0	87.0	86.3	83.6	87.0	84.6	86.6	91.0	88.6
1	4	50	53	60	75	83	95	93	85	88
2		48	52	50	55	68	90	90	83	78
3		98	97	98	100	100	98	95	100	95
4		48	51	53	65	83	78	80	83	88
5		95	96	93	98	93	85	90	93	90
6		80	87	90	100	83	85	80	68	78
7		78	84	83	95	98	93	98	98	95
Mean		71.0	74.3	75.3	84.0	86.9	89.1	89.4	87.1	87.4
1	5	70	73	70	75	80	88	83	85	88
2		90	91	93	95	90	93	88	83	80
3		95	96	95	93	100	100	98	98	98
4		90	95	98	98	83	85	95	80	83
5		69	68	73	50	68	90	95	88	95
6		83	82	78	90	93	93	83	88	83
7		75	77	78	73	83	95	93	95	93
Mean		81.6	83.1	83.6	82.0	85.2	92.0	90.7	88.1	88.6
1	6	53	54	63	78	78	83	80	73	83
2		75	76	75	70	78	75	78	68	78
3		58	60	60	55	70	78	90	95	98
4		85	88	95	100	95	90	95	95	95
5		98	96	90	98	93	90	83	90	93
6		48	44	35	73	75	78	80	80	78
7		73	76	75	75	75	73	80	75	78
Mean		70.0	70.6	70.4	78.4	80.6	81.0	83.7	82.3	86.1

APPENDIX 31

PERCENTAGE GERMINATION OF SEED DEVELOPED FROM FLORETS
OPEN ON DIFFERENT DAYS AND HARVESTED AT INTERVALS UP
TO 30 DAYS AFTER ANTHESIS

PERENNIAL RYEGRASS

Treatment	Day of Anthesis	Harvest Date (Days after Anthesis)								
		4	7	10	14	18	21	24	28	30
1	1	0	0	0	17	82	90	92	89	93
2	(1.12.68)	0	0	31	42	87	93	87	90	92
3		0	3	26	41	80	82	93	94	92
4		0	0	7	32	78	68	90	90	91
5		0	2	14	36	71	77	88	90	88
6		0	0	27	57	93	93	100	97	96
7		0	0	8	26	82	80	92	90	90
1	3	0	0	7	42	91	88	100	91	93
2	(3.12.68)	0	0	8	50	82	83	87	97	100
3		0	6	16	28	78	77	91	90	95
4		0	0	19	36	74	80	84	89	87
5		0	0	11	37	89	97	100	91	95
6		0	11	8	38	80	81	87	88	86
7		0	0	7	40	86	86	89	93	90
1	4	0	0	22	25	75	83	92	92	100
2	(4.12.68)	0	0	21	65	82	89	97	93	95
3		0	0	16	30	83	92	91	92	88
4		0	0	11	33	87	89	90	94	91
5		0	0	7	32	84	91	100	93	97
6		0	0	20	26	80	90	95	90	100
7		0	0	7	38	83	89	100	93	93
1	6	0	0	20	56	70	70	92	94	89
2	(6.12.68)	0	7	33	33	80	85	87	91	92
3		0	0	16	75	85	100	89	92	88
4		0	0	26	30	85	87	91	87	90
5		0	0	8	40	87	100	93	96	98
6		0	0	0	30	92	91	90	97	93
7		0	4	13	25	95	92	89	92	93
1	8	0	0	19	42	83	86	88	86	81
2	(8.12.68)	0	0	0	31	78	83	92	90	93
3		0	0	11	37	87	91	90	95	92
4		0	0	16	49	87	90	87	93	96
5		0	0	23	36	82	88	80	91	90
6		0	0	17	40	76	93	79	94	92
7		0	0	2	32	81	82	89	96	91

OVER

APPENDIX 31 (Continued)

Treatment	Day of Anthesis	Harvest Date (Days after Anthesis)								
		4	7	10	14	18	21	24	28	30
1	9	0	0	18	43	84	80	97	100	99
2	(9.12.68)	0	0	0	90	82	77	86	87	100
3		0	0	30	49	81	83	90	80	89
4		0	0	0	60	85	86	86	93	90
5		0	0	0	33	80	88	87	89	86
6		0	0	18	55	80	79	89	92	100
7		0	0	0	30	81	82	80	97	92
1	10	0	0	20	60	86	91	100	97	96
2	(10.12.68)	0	3	17	30	87	87	100	100	98
3		0	0	0	60	80	73	90	90	91
4		0	6	6	28	83	80	93	87	90
5		0	0	26	40	77	77	80	87	81
6		0	0	0	67	90	90	88	100	95
7		0	0	0	35	93	76	82	94	85
1	11	0	20	0	75	92	90	83	97	100
2	(11.12.68)	0	0	11	20	86	83	90	91	88
3		0	0	0	30	81	87	100	86	93
4		0	0	0	50	82	90	92	98	98
5		0	4	10	33	86	88	90	93	93
6		0	0	0	80	97	100	97	92	94
7		0	0	0	50	91	86	100	97	93
1	12	0	25	0	38	78	86	95	93	90
2	(12.12.68)	0	11	17	52	82	100	96	100	87
3		0	0	20	67	81	90	93	96	91
4		0	0	4	30	83	86	96	94	95
5		0	24	0	60	78	83	97	100	93
6		0	20	0	69	87	87	95	94	98
7		0	0	0	100	86	84	100	94	92
Mean all days		0	2.4	11.4	43.8	83.4	86.1	91.3	92.7	92.5

OVER

APPENDIX 31 (Continued)

PRAIRIE GRASS

Treatment	Day of Anthesis	Harvest Date (Days after Anthesis)								
		4	7	10	14	18	21	24	28	30
1	1 (11.11.68)	2	23	27	72	88	92	91	96	94
2		7	27	42	83	94	92	90	91	91
3		9	10	38	88	93	93	89	93	91
4		11	15	46	92	94	96	94	90	92
5		6	19	33	76	91	90	93	88	93
6		3	22	48	91	93	92	91	94	91
7		8	16	42	83	89	92	92	93	94
1	2	5	16	51	91	96	97	95	96	95
2		2	19	42	88	94	95	93	91	92
3		11	24	53	77	88	93	96	94	91
4		7	16	40	93	94	95	92	93	92
5		12	22	57	92	94	92	94	91	93
6		4	19	48	87	90	94	92	92	94
7		1	13	46	91	89	93	96	93	95
1	3	9	12	48	89	90	91	92	90	92
2		3	8	29	76	79	89	90	90	91
3		8	20	51	90	89	90	91	88	92
4		8	17	42	79	82	90	89	90	92
5		12	25	53	88	93	92	92	93	90
6		7	19	37	82	93	94	93	96	93
7		3	18	31	68	87	91	94	92	91
1	4	1	17	50	92	93	94	96	95	96
2		4	12	34	63	86	90	91	90	89
3		10	13	46	87	92	93	92	91	93
4		6	12	36	87	94	91	93	90	94
5		4	19	42	89	90	92	93	92	92
6		4	10	31	84	93	94	95	93	94
7		5	17	47	86	91	90	91	91	91
1	5	8	19	43	90	92	95	93	91	94
2		11	11	46	88	89	92	96	95	95
3		6	16	37	86	87	90	92	91	90
4		2	10	51	93	94	95	92	96	94
5		2	16	42	86	86	93	91	92	93
6		0	17	48	82	91	90	89	91	91
7		4	19	40	85	93	91	92	89	90
1	6	6	29	48	87	91	92	93	92	93
2		3	9	51	90	92	92	94	94	93
3		7	16	53	92	92	92	91	93	93
4		8	17	33	81	93	91	92	92	91
5		0	18	37	83	94	90	94	90	93
6		9	12	61	89	91	94	95	92	94
7		8	17	52	94	96	93	91	93	95
Mean all days		5.9	16.6	43.6	85.5	91.0	92.3	92.5	92.1	92.8