

Table 2. Non-waterfowl bird surveys for 1993 corn fields for the three farming systems. Figures are in breeding bird pairs per hectare (within a row, means followed by the same letter are not significantly different; Scheffe interaction test, $P < 0.05$, $n=30$, $df=27$).

Species	Farming System			Pr > F
	CON	ORG	TNT	
Red-winged Blackbird	0.182	0.000	1.046	0.0777
Yellow-headed Blackbird	0.256	0.000	0.334	0.2050
Common Grackle	0.059	0.147	0.101	0.2842
Brown-headed Cowbird	0.253	0.000	0.078	0.8429
Eastern Kingbird	0.000	0.461	0.117	0.0749
Western Kingbird	0.000	0.000	0.000	--
Common Yellowthroat	0.021	0.000	0.039	0.8048
American Goldfinch	0.079	0.147	0.000	0.1597
Horned Lark	0.298	0.000	0.217	0.3016
Western Meadowlark	0.000	0.000	0.000	--
Mourning Dove	0.027	0.000	0.012	0.8461
Killdeer	0.027A	0.000A	0.244B	0.0033
Upland Sandpiper	0.000	0.000	0.012	0.3223
Song Sparrow	0.068	0.147	0.103	0.4603
Vesper Sparrow	0.175	0.000	0.050	0.6648
Chipping Sparrow	0.000	0.000	0.000	--
Grasshopper Sparrow	0.000	0.000	0.000	--
Le Conte's Sparrow	0.039	0.000	0.000	0.7305
Field Sparrow	0.006	0.000	0.000	0.7305
Savannah Sparrow	0.000	0.000	0.000	--
American Tree Sparrow	0.000	0.000	0.000	--
Lark Sparrow	0.000	0.000	0.000	--
Dickcissel	0.031	0.000	0.000	0.7305
Bobolink	0.000	0.000	0.000	--
Lark Bunting	0.000	0.000	0.000	--
Ring-necked Pheasant	0.000	0.000	0.000	--
Gray Partridge	0.000	0.000	0.000	--
Unidentified	0.078	0.000	0.000	0.7305

Table 3. Non-waterfowl bird surveys for 1992 stubble corn fields for the three farming systems. Figures are in breeding bird pairs per hectare (within a row, means followed by the same letter are not significantly different; Scheffe interaction test, $P < 0.05$, $n = 18$, $df = 15$).

Species	Farming System			Pr > F
	CON	ORG	TNT	
Red-winged Blackbird	0.000A	1.954B	1.245B	0.0165
Yellow-headed Blackbird	0.241A	0.188A	1.442B	0.0001
Common Grackle	0.000	0.207	0.074	0.7335
Brown-headed Cowbird	0.000	0.254	0.222	0.3848
Eastern Kingbird	0.000	0.376	0.035	0.3490
Western Kingbird	0.000	0.000	0.020	0.6346
Common Yellowthroat	0.000	0.103	0.000	0.3911
American Goldfinch	0.000	0.085	0.000	0.3911
Horned Lark	0.000	0.000	0.090	0.3687
Western Meadowlark	0.000	0.103	0.000	0.3911
Mourning Dove	0.241	0.310	0.054	0.8655
Killdeer	0.000	0.376	0.395	0.2348
Upland Sandpiper	0.000	0.000	0.000	--
Song Sparrow	0.000	0.188	0.278	0.4331
Vesper Sparrow	0.000	0.207	0.413	0.5794
Chipping Sparrow	0.000	0.000	0.000	--
Grasshopper Sparrow	0.000	0.000	0.000	--
Le Conte's Sparrow	0.000	0.000	0.000	--
Field Sparrow	0.000	0.000	0.000	--
Savannah Sparrow	0.000	0.000	0.000	--
American Tree Sparrow	0.000	0.000	0.000	--
Lark Sparrow	0.000	0.000	0.000	--
Dickcissel	0.000	0.000	0.000	--
Bobolink	0.000	0.000	0.000	--
Lark Bunting	0.000	0.000	0.000	--
Ring-necked Pheasant	0.000	0.085	0.034	0.7650
Gray Partridge	0.000	0.000	0.000	--
Unidentified	0.000	0.000	0.000	--

Table 4. Non-waterfowl bird surveys for 1993 soy bean fields for the three farming systems. Figures are in breeding bird pairs per hectare (within a row, means followed by the same letter are not significantly different; Scheffe interaction test, $P < 0.05$, $n = 18$, $df = 15$).

Species	Farming System			Pr > F
	CON	ORG	TNT	
Red-winged Blackbird	0.314	0.142	0.213	0.8868
Yellow-headed Blackbird	0.000	0.285	1.187	0.3458
Common Grackle	0.000	0.000	0.071	0.3911
Brown-headed Cowbird	0.000	0.000	0.071	0.3911
Eastern Kingbird	0.000	0.000	0.000	--
Western Kingbird	0.000	0.000	0.000	--
Common Yellowthroat	0.000	0.000	0.000	--
American Goldfinch	0.000	0.000	0.071	0.3911
Horned Lark	0.000	0.071	0.284	0.6145
Western Meadowlark	0.000	0.065	0.000	0.3911
Mourning Dove	0.000A	0.000A	0.405B	0.0228
Killdeer	0.157	0.213	0.962	0.2502
Upland Sandpiper	0.000	0.000	0.000	--
Song Sparrow	0.000	0.272	0.213	0.3911
Vesper Sparrow	0.000	0.000	0.071	0.3911
Chipping Sparrow	0.000	0.000	0.000	--
Grasshopper Sparrow	0.000	0.000	0.000	--
Le Conte's Sparrow	0.000	0.000	0.000	--
Field Sparrow	0.000	0.065	0.000	0.3911
Savannah Sparrow	0.000	0.000	0.000	--
American Tree Sparrow	0.000	0.000	0.000	--
Lark Sparrow	0.000	0.000	0.000	--
Dickcissel	0.000	0.000	0.000	--
Bobolink	0.000	0.000	0.000	--
Lark Bunting	0.000	0.000	0.000	--
Ring-necked Pheasant	0.000	0.000	0.000	--
Gray Partridge	0.000	0.000	0.000	--
Unidentified	0.000	0.071	0.000	0.3911

Table 5. Non-waterfowl bird surveys for 1992 stubble soy bean fields for the three farming systems. Figures are in breeding bird pairs per hectare (within a row, means followed by the same letter are not significantly different; Scheffe interaction test, $P < 0.05$, $n=6$, $df=4$).

Species	Farming System			Pr > F
	CON	ORG ^a	TNT	
Red-winged Blackbird	0.606	--	0.635	0.8541
Yellow-headed Blackbird	0.000A	--	0.370B	0.0065
Common Grackle	0.000	--	0.212	0.1270
Brown-headed Cowbird	0.000	--	0.212	0.3739
Eastern Kingbird	0.000	--	0.053	0.3739
Western Kingbird	0.000	--	0.000	--
Common Yellowthroat	0.606	--	0.000	0.1270
American Goldfinch	0.000	--	0.000	--
Horned Lark	0.000	--	0.106	0.1161
Western Meadowlark	0.000	--	0.000	--
Mourning Dove	0.000	--	0.106	0.3739
Killdeer	0.000	--	0.159	0.3739
Upland Sandpiper	0.000	--	0.000	--
Song Sparrow	0.202	--	0.053	0.8276
Vesper Sparrow	0.202	--	0.000	0.3739
Chipping Sparrow	0.000	--	0.000	--
Grasshopper Sparrow	0.000	--	0.000	--
Le Conte's Sparrow	0.000	--	0.000	--
Field Sparrow	0.000	--	0.000	--
Savannah Sparrow	0.000	--	0.000	--
American Tree Sparrow	0.000	--	0.000	--
Lark Sparrow	0.000	--	0.000	--
Dickcissel	0.404	--	0.000	0.3739
Bobolink	0.202	--	0.000	0.3739
Lark Bunting	0.000	--	0.000	--
Ring-necked Pheasant	0.000	--	0.000	--
Gray Partridge	0.000	--	0.000	--
Unidentified	0.000	--	0.000	--

^a No 1992 soy bean stubble fields were available to survey on the ORG farming system.

Table 6. Non-waterfowl bird surveys for 1993 alfalfa fields for the three farming systems. Figures are in breeding bird pairs per hectare (within a row, means followed by the same letter are not significantly different; Scheffe interaction test, $P < 0.05$, $n = 45$, $df = 43$).

Species	Farming System			Pr > F
	CON	ORG	TNT ^a	
Red-winged Blackbird	0.586	0.569	--	0.8944
Yellow-headed Blackbird	0.618	0.102	--	0.4868
Common Grackle	0.069	0.114	--	0.8782
Brown-headed Cowbird	0.139	0.146	--	0.6079
Eastern Kingbird	0.382	0.113	--	0.2183
Western Kingbird	0.000	0.000	--	--
Common Yellowthroat	0.379	0.204	--	0.8540
American Goldfinch	0.277	0.154	--	0.1099
Horned Lark	0.000	0.000	--	--
Western Meadowlark	0.000	0.147	--	0.1190
Mourning Dove	0.000	0.009	--	0.5526
Killdeer	0.000	0.064	--	0.2906
Upland Sandpiper	0.000	0.000	--	--
Song Sparrow	0.346	0.165	--	0.9068
Vesper Sparrow	0.174	0.082	--	0.7794
Chipping Sparrow	0.000	0.054	--	0.3946
Grasshopper Sparrow	0.208A	0.793B	--	0.0368
Le Conte's Sparrow	1.001	0.334	--	0.1959
Field Sparrow	0.000	0.003	--	0.5526
Savannah Sparrow	0.000	0.043	--	0.3946
American Tree Sparrow	0.000	0.000	--	--
Lark Sparrow	0.000	0.013	--	0.5526
Dickcissel	0.689	0.874	--	0.1713
Bobolink	0.208	0.082	--	1.0000
Lark Bunting	0.000	0.000	--	--
Ring-necked Pheasant	0.000	0.000	--	--
Gray Partridge	0.000	0.000	--	--
Unidentified	0.069	0.090	--	0.9389

^a No alfalfa fields were available to survey on the TNT farming system.

Table 7. Non-waterfowl bird surveys for 1993 oats fields for the three farming systems. Figures are in breeding bird pairs per hectare (within a row, means followed by the same letter are not significantly different; Scheffe interaction test, $P < 0.05$, $n = 21$, $df = 19$).

Species	Farming System			Pr > F
	CON	ORG	TNT ^a	
Red-winged Blackbird	0.000	0.535	--	0.2672
Yellow-headed Blackbird	5.714	0.432	--	0.6267
Common Grackle	0.000	0.000	--	--
Brown-headed Cowbird	0.000	0.034	--	0.6939
Eastern Kingbird	0.000	0.034	--	0.6939
Western Kingbird	0.000	0.000	--	--
Common Yellowthroat	0.000	0.000	--	--
American Goldfinch	0.000	0.080	--	0.4718
Horned Lark	0.000	0.028	--	0.6939
Western Meadowlark	0.635A	0.000B	--	0.0001
Mourning Dove	0.000	0.000	--	--
Killdeer	0.000	0.135	--	0.3256
Upland Sandpiper	0.000	0.072	--	0.6939
Song Sparrow	0.317	0.057	--	0.2945
Vesper Sparrow	0.000	0.017	--	0.6939
Chipping Sparrow	0.000	0.000	--	--
Grasshopper Sparrow	0.000	0.048	--	0.5678
Le Conte's Sparrow	0.000	0.000	--	--
Field Sparrow	0.000	0.000	--	--
Savannah Sparrow	0.000	0.000	--	--
American Tree Sparrow	0.000	0.000	--	--
Lark Sparrow	0.000	0.000	--	--
Dickcissel	0.317A	0.000B	--	0.0102
Bobolink	0.000	0.017	--	0.6939
Lark Bunting	0.000	0.000	--	--
Ring-necked Pheasant	0.000	0.000	--	--
Gray Partridge	0.000	0.000	--	--
Unidentified	0.000	0.000	--	--

^a No oats fields available to survey on the TNT farming system.

Table 8. Non-waterfowl bird surveys for 1993 fallow fields for the three farming systems. Figures are in breeding bird pairs per hectare (within a row, means followed by the same letter are not significantly different; Scheffe interaction test, $P < 0.05$, $n=12$, $df=10$).

Species	Farming System			Pr > F
	CON ^a	ORG	TNT	
Red-winged Blackbird	--	1.058	1.348	0.0934
Yellow-headed Blackbird	--	0.847A	0.780B	0.0432
Common Grackle	--	0.053	0.071	0.5037
Brown-headed Cowbird	--	0.317	0.355	0.9183
Eastern Kingbird	--	0.114	0.000	0.5884
Western Kingbird	--	0.000	0.000	--
Common Yellowthroat	--	0.000	0.000	--
American Goldfinch	--	0.000	0.213	0.0816
Horned Lark	--	0.285	0.426	0.2132
Western Meadowlark	--	0.171	0.071	0.9101
Mourning Dove	--	0.000	0.000	--
Killdeer	--	0.265	0.496	0.1256
Upland Sandpiper	--	0.000	0.000	--
Song Sparrow	--	0.000	0.000	--
Vesper Sparrow	--	0.057	0.000	0.5884
Chipping Sparrow	--	0.000	0.000	--
Grasshopper Sparrow	--	0.108	0.000	0.5884
Le Conte's Sparrow	--	0.106	0.000	0.5884
Field Sparrow	--	0.000	0.071	0.0816
Savannah Sparrow	--	0.000	0.000	--
American Tree Sparrow	--	0.000	0.000	--
Lark Sparrow	--	0.000	0.000	--
Dickcissel	--	0.021	0.000	0.5884
Bobolink	--	0.000	0.000	--
Lark Bunting	--	0.000	0.000	--
Ring-necked Pheasant	--	0.000	0.000	--
Gray Partridge	--	0.000	0.000	--
Unidentified	--	0.057	0.000	0.5884

^a No fallow fields were available to survey on the CON farming system.

Table 9. Waterfowl broods (BWT=blue-winged teal, RED=redhead, MAL=mallard, RUD=ruddy duck) counted during the summer of 1993 on the three farming systems with the number of ducklings in each brood (in parentheses, nv=not visible).

System	Wetland Class ^a		Time period ^b				
			WK1	WK2	WK3	WK4	
Conventional	15A	S	BWT(nv)	BWT(1)	BWT(6)	BWT(7)	
	15D	S	0	0	0	0	
	15G	SP	0	BWT(nv)	0	0	
	15I	S	0	0	0	0	
	16A	S	0	0	0	0	
	21D	S	0	0	0	0	
	21E	S	0	0	0	0	
	21H	SP	0	0	0	0	
	21K	SP	0	0	0	0	
	Organic	24E	T	0	0	0	0
		26A	SP	RED(8)	RED(7) RED(8)	RED(10)	BWT(3)
26F		SP	0	0	0	0	
26G		S	0	0	0	0	
26H		S	0	0	MAL(6)	BWT(6) MAL(5-8)	
26J		S	0	0	0	0	
26N		S	0	0	0	0	
36B		S	0	0	0	0	
36H		S	0	0	0	BWT(12)	
36I		S	0	0	0	0	
36K		T	0	0	0	0	
36L		T	0	0	0	0	
Transitional No-Till		27C/D	T	0	0	0	0
		27F	S	0	0	0	0
	27J	SP	MAL(nv)	RED(nv)	0	0	
	27Q	S	0	0	0	0	
	27R	SP	0	0	0	0	
	27S	SP	0	0	0	0	
	34G	SP	RUD(4)	0	0	0	
	34H	S	0	0	0	0	
	34K	SP	RED(5)	0	0	MAL(6)	

^a T=temporary, S=seasonal, SP=semipermanent

^b WK1 = June 20-25, WK2 = July 13-18, WK3 = July 25-30, WK4 = August 8-12

Table 10. Species richness (number of species) of plants in selected seasonal and semipermanent wetlands in the three farming systems.

System	Seasonal		Semipermanent	
	ID ^a	N ^b	ID	N
CON	15A	17	21H	21
	21D	21		
	21E	18		
ORG	26G	15	26F	32
	36H	12	26H	25
TNT	27F	32	27J	23
	27H	23	34G	27
	27Q	19		
	34H	14		

^a Wetland identifier.

^b Number of species.

Table 11. Relative surface area.

Wetland	Month 1993	Volume	Wetland	Month 1993	Volume
1	May	-	7	May	0
	Jun	+		Jun	-
	Jul	+		Jul	-
	Aug	-		Aug	-
	Sep	-		Sep	Dry
2	May	0	8	May	0
	Jun	+		Jun	+
	Jul	+		Jul	-
	Aug	+		Aug	-
	Sep	-		Sep	-
3	May	0	9	May	+
	Jun	+		Jun	+
	Jul	+		Jul	+
	Aug	+		Aug	-
	Sep	-		Sep	-
4	May	-	11	May	-
	Jun	+		Jun	0
	Jul	+		Jul	-
	Aug	-		Aug	-
	Sep	-		Sep	-
5	May	+	12	May	-
	Jun	+		Jun	+
	Jul	+		Jul	+
	Aug	+		Aug	0
	Sep	+		Sep	-
6	May	-	13	May	+
	Jun	-		Jun	+
	Jul	-		Jul	+
	Aug	-		Aug	0
	Sep	-		Sep	-

Relative surface area based on reference level taken in April (snow melt), legend is as follows:

- 0 = Reference Level
- + = more than Reference Level
- = less than Reference Level

Table 12. Pesticide hits in groundwater samples taken April 20, 1993.

Wetland	Pesticide				
	Treflan	Atrazine	Counter	Lasso	Dual
2					
3				*	
5	*	*		*	
7		*		*	
9		*		*	*
12		*	*	*	*
13		*	*	*	
Wetland	Ramrod	Bladex	Sencore	Sutan	Banvel
2			*		
3	*			*	
5		*	*	*	
7	*			*	
9		*		*	
12		*		*	
13				*	*
Wetland	2,4 D	Buctril			
2	*	*			
3					
5	*	*			
7	*	*			
9					
12	*				
13		*			

* indicates hit
 Dyfonate, Prowl, Thimet, Dursban, Parathion, EPTC, and Tordon were also tested for but no hits occurred.

Table 13. Most Probable Number (MPN) Values for First Sampling Date (Oven Dry Weight Basis)

	<u>Denitrifiers (cells/g soil)</u>	<u>Dissimilatory ammonia producers (cells/g soil)</u>
Wetland #5 (ORG)		
Upland	1.7 x 10 ⁵	3.5 x 10 ⁵
Lowland	1.8 x 10 ⁶	>1.8 x 10 ⁶
Wetland #8 (TNT)		
Upland	2.8 x 10 ³	9.3 x 10 ⁵
Lowland	4.0 x 10 ⁴	4.9 x 10 ⁴

Most Probable Number (MPN) Values for Second Sampling Date (Oven Dry Weight Basis)

	<u>Denitrifiers (cells/g soil)</u>	<u>Dissimilatory ammonia producers (cells/g soil)</u>
Wetland #5 (ORG)		
Upland	2.8 x 10 ⁵	1.6 x 10 ⁶
Lowland	2.4 x 10 ⁴	3.8 x 10 ³
Wetland #8 (CON)		
Upland	3.6 x 10 ⁴	2.9 x 10 ⁵
Lowland	1.7 x 10 ⁴	776.0
Wetland #13 (low input)		
Upland	9.2 x 10 ⁵	4.3 x 10 ⁵
Lowland	3.3 x 10 ⁴	2.4 x 10 ⁴

Table 14. Overview of Cultural Practices by Management System

14.a Transitional No-till (TNT)

CORN (Grain)

1. Tandem disk - 1x on 75 acres of 400 total acres
2. Plant - Liquid 10-34-0 applied with planter (10 gal/acre)
 - Force insecticide applied with planter on 200 acres of 400 total acres (9 lbs/acre)
 - 30" rows
 - 24,000 seeds/acre population
3. Spray - Broadcast treatment on all acres
 - Bladex (1 lb/acre)
 - Extrazine (2 lb/acre)
 - Banvel (0.5 pt/acre)
4. Anhydrous applied on all acres (130 lbs N actual/acre)
5. Harvest

CORN (Silage)

1. Same as corn for grain except Force insecticide was used on all corn for silage acres.

SOYBEANS

1. Tandem disk - 1x on 80 acres of 395 total acres
2. Pre-plant chemical burndown - Roundup (6 oz/acre)
 - 2,4-D ester (1 pt/acre)
3. Plant - No-till drill
 - 7.5" spacing
 - 80 lbs/acre seeding rate
4. Spray - Broadcast treatment on all acres
 - Pursuit (4 oz/acre)
 - Fusion (4 oz/acre)
5. Harvest

ALFALFA (Established stand)

1. Broadcast 10-34-0 dry fertilizer (120 lbs/acre)
2. Three cuttings per year

MILLET HAY (Set aside acres)

1. Tandem disk - 1x
2. Plant - No-till drill
 - 22 lbs/acre seeding rate
3. Harvest

Table 14 - Continued

14.b Conventional (CON)

CORN:

1. Tandem disk - 2x
2. Pony drag - 1x with tandem disk
3. Plant - Liquid Lasso MicroTec banded with planter (1 qt/acre)
- Counter insecticide banded with planter (5.03 lbs/acre)
- 38" rows
- 18,600 seeds/acre population
4. Cultivate
5. Spray - Broadcast treatment of Marksman (3 pt/acre)
6. Cultivate - 28% applied with cultivator (60 lbs N actual/acre)
7. Harvest
8. Grazing by cattle

CORN & SORGHUM MIX (SILAGE)

1. Broadcast cattle manure
2. Tandem disk - 2x
3. Pony drag - 1x with tandem disk
4. Plant - Alternate rows with corn and sorghum
- Lasso MicroTec banded on corn rows only (1pt/acre)
- No insecticide used
- 38" rows
- 18,600 seeds/acre population for corn
- 10 lbs/acre for sorghum seed
5. Cultivate
6. Spray - Broadcast treatment of Buctril (1.1 pt/acre)
7. Cultivate - 28% applied with cultivator (60 lbs N actual/acre)
8. Harvest - 2 row silage cutter
- 1 row of corn & 1 row of sorghum

SOYBEANS

1. Tandem disk - 1x
- Treflan applied with disk (1.5 pt/acre)
2. Field cultivator - 1x
3. Pony drag - 1x with field cultivator
4. Plant - press drill
- 6" spacing
- 60 to 65 lbs/acre soybean seed
5. Spray - Broadcast treatment of Basagran (1.5 pt/acre)
6. Harvest

Table 14 - Continued

14.b - Continued

ALFALFA (New seeding)

1. Broadcast dry 18-46-0 fertilizer (125lbs/acre)
2. Field cultivator - 1x
3. Pony drag - 1x with field cultivator
4. Plant - press drill
 - 6" spacing
 - Alfalfa seeded at 8 lbs/acre
 - Oats seeded at 2 bu/acre
5. Oats clipped or harvested
6. One cutting of alfalfa taken

ALFALFA (Established stand)

1. Broadcast dry 18-46-0 fertilizer - 3rd & 4th year stands only
 - 100 lbs/acre
2. Three cuttings per year of alfalfa

CORN (Following alfalfa stand)

1. Spring moldboard plowing - 1x
2. Harrow - 1x mounted on plow
3. Field cultivator - 1x
4. Pony drag - 1x with field cultivator
5. Plant - Lasso MicroTec banded with planter (1 qt/acre)
 - No insecticide used
 - 38" rows
 - 18,600 seeds/acre population
6. Cultivate
7. Spray - Broadcast treatment of Marksman (3 pt/acre)
8. Cultivate - 28% applied with cultivator (60 lbs N actual/acre)
9. Harvest & Grazing by cattle

Table 14 - Continued

14.c Organic (ORG)

CORN

1. Tandem disk - 1x
2. Field cultivator - 1x
3. Plant - 30" rows
- 22,000 seeds/acre population
4. Harrow - 1x
5. Rotary hoe - 1x
6. Cultivate - 1.5x
7. Spray - Emergency broadcast treatment on 52 acres
- Buctril (1.2 pt/acre)
8. Harvest (Cattle grazed on 30 acres)
9. Tandem disk - 1x on 25 acres

SOYBEANS

1. Tandem disk - 1x
2. Field cultivator - 1x
3. Plant - 30" rows
- 175,000 seeds/acre seeding rate
4. Rotary hoe - 1x
5. Cultivate - 1x
6. Harvest
7. Plant - winter rye into soybean stubble (17 acres only)
- press drill w/6" spacing
- 1 bu/acre seeding rate for winter rye
8. Chisel plow - 1x on 86 acres

ALFALFA (Established stand)

1. Three cuttings per year
2. Chisel plow - 2x on 82 acres
- 1x with straight points
- 1x with 16" sweeps

WHEAT W/ALFALFA

1. Tandem disk - 1x
2. Plant - press drill w/6" spacing
- alfalfa interseeded with wheat
- alfalfa at 6 lbs/acre
- wheat at 1.25 bu/acre
3. Drag - 1x
4. Harvest

OATS W/ALFALFA

1. Tandem disk - 1.5x
2. Plant - press drill w/6" spacing
- alfalfa interseeded with oats
- alfalfa at 6 lbs/acre
- oats at 2 bu/acre
3. Drag - 1x
4. Harvest

Table 15 Historical Crop Acreage by Mgt System 1988-1992

15.a Transitional No-till (TNT)

CROP ACREAGE	1992	1991	1990	1989	1988
CORN	400.0	420.0	398.0	400.0	336.0
CORN (SILAGE)	40.0	25.0	0.0	0.0	0.0
SOYBEANS	395.0	400.0	470.0	415.0	325.0
WHEAT	0.0	0.0	0.0	0.0	0.0
OATS (GRAIN)	0.0	0.0	0.0	60.0	0.0
BARLEY (GRAIN)	0.0	60.0	0.0	0.0	0.0
BARLEY/ALFALFA	0.0	0.0	61.0	0.0	0.0
MILLET (ACR)	35.0	0.0	44.0	58.0	96.0
PASTURE MIX (ACR)	0.0	45.0	0.0	65.0	48.0
IDLE (ACR)	0.0	41.0	0.0	0.0	0.0
ALFALFA	160.0	100.0	0.0	0.0	0.0
CROPLAND	1030.0	1091.0	973.0	998.0	805.0
PASTURE	300.0	300.0	300.0	300.0	230.0
OTHER	190.0	129.0	167.0	142.0	165.0
TOTAL ACRES OPERATED	1520.0	1520.0	1440.0	1440.0	1200.0

* Includes building sites, grass waterways, non-farmed wetlands and wet spots, and native grasses.

Table 15 - Continued

15.b Conventional (CON)

CROP ACREAGE	1992	1991	1990	1989	1988
CORN	195.4	229.5	139.8	164.3	144.7
CORN/SORGHUM SILAGE	35.0	35.0	35.0	35.0	8.1
SOYBEANS	43.7	127.4	67.0	67.6	45.9
OATS (GRAIN)	0.0	0.0	24.5	27.4	42.7
OATS/ALFALFA (GRAIN)	8.8	4.7	13.3	0.0	0.0
OATS/ALFALFA (ACR)	12.1	22.7	20.0	20.4	35.8
SUDAN (ACR)	0.0	0.0	0.0	0.0	20.8
ALFALFA	57.8	79.9	68.1	53.0	69.7
CROPLAND	352.8	499.2	367.7	367.7	367.7
PASTURE	245.0	167.6	167.6	167.6	167.6
*OTHER	42.2	53.2	24.7	24.7	24.7
TOTAL ACRES OPERATED	640.0	720.0	560.0	560.0	560.0

* Includes building sites, grass waterways, non-farmed wetlands and wet spots, and native grass.

Table 15 - Continued

15.c Organic (ORG)

CROP ACREAGE	1992	1991	1990	1989	1988
CORN	163.0	206.0	169.0	220.0	162.0
SOYBEANS	260.0	227.0	267.0	310.0	172.0
SOYBEANS (FALL RYE)	17.0	0.0	0.0	0.0	0.0
S. WHEAT (FALL RYE)	0.0	17.0	0.0	0.0	0.0
S. WHEAT	0.0	0.0	35.0	0.0	40.0
S.WHEAT/ALFALFA MIX	31.0	53.0	0.0	40.0	0.0
OATS	0.0	0.0	21.0	0.0	66.0
OATS/ALFALFA MIX	131.0	109.0	179.0	120.0	34.0
OATS/CLOVER MIX	0.0	0.0	0.0	50.0	0.0
BARLEY/ALFALFA MIX	0.0	0.0	0.0	0.0	106.0
RYE	16.0	0.0	0.0	0.0	0.0
ALFALFA	188.0	194.0	179.0	160.0	140.0
CROPLAND	806.0	806.0	850.0	900.0	720.0
PASTURE	180.0	180.0	180.0	180.0	180.0
WATERBANK	53.2	53.2	0.0	0.0	0.0
* OTHER	160.8	160.8	170.0	120.0	140.0
TOTAL ACRES OPERATED	1200.0	1200.0	1200.0	1200.0	1040.0

* Includes building sites, grass waterways, non-farmed wetlands and wet spots, and native grass.

Table 16 Farmer Reported Yields by Crop, 1988-1992

Transitional No-till (TNT)

YEAR	CORN (BU)	CORN SILAGE (T)	SOY-BEANS (BU)	OATS GRAIN (BU)	MILLET HAY (T)	BARLEY (BU)	ALFAL (T)
1988	95		40		2.0		
1989	91		35	53	3.0		
1990	105		33			50	
1991	108	10	33			51	4.0
1992	98	13	32		0.3		5.0
1993							

Conventional (CON)

YEAR	CORN (BU)	CORN SILAGE (T)	SORG-HUM (T)	SOY BEANS (BU)	OATS (BU)	SUDAN (T)	ALFAL (T)
1988	93.0	15.8		37.5	55.0		2.75
1989	95.0	16.1		37.5	60.0		3.00
1990	96.3	16.2		40.0	55.0		3.50
1991	100.0	16.75		40.0			3.75
1992	110.0	15.0		33.0	90.0		3.50

Organic (ORG)

YEAR	CORN (BU)	SOY-BEANS (BU)	OATS GRAIN (BU)	RYE (BU)	WHEAT (BU)	BARLEY (BU)	ALFAL TONS
1988	92.5	34	20		11	15	3.0
1989	87.5	26	30		18		2.5
1990	93.5	26.5	57		13		3.0
1991	95	26	55		23		3.3
1992	69	21	43.3	22	36.8		3.3
1993							

Table 17 Field Tract Size and Soil Types Present by Mgt System

17.a Transitional No-till (TNT)

Mgt. System	Field ID.	Field Size	Soil Types & Acres per Field			
TNT	TNT 23-A	10.0	VbA 5.0	EsE 5.0		
TNT	TNT 23-B	13.7	EbB 7.0	EsE 3.0	EhB 3.0	EaC 0.7
TNT	TNT 23-C	8.7	Wh 5.0	Wo 2.7	EsE 1.0	
TNT	TNT 23-D	37.3	EgA 15.0	EhB 15.0	Wh 4.3	EbB 2.0
			Wo 1.0			
TNT	TNT 23-E	38.7	EbB 18.0	VbA 8.7	EgA 8.0	Wh 4.0
TNT	TNT 24-A	52.0	EhB 18.0	EaC 13.0	VbA 10.0	EaC2 6.0
			Wh 2.0	EbB 2.0	EgA 1.0	
TNT	TNT 24-B	61.0	EhB 36.0	Wh 10.0	VbA 7.0	Ba 5.0
			VgB 2.0	EbB 1.0		
TNT	TNT 24-C	6.5	EhB 3.0	Wh 2.5	EsE 0.5	Wo 0.5
TNT	TNT 27-A	66.1	EbB 26.0	EhB 14.0	Wh 8.0	EbC 7.0
			Wo 5.1	WeA 3.0	VbA 3.0	
TNT	TNT 27-A-1	4.0	Wo 4.0			
TNT	TNT 27-B	8.5	Wo 3.5	EbB 3.0	Ba 1.5	Te 0.5
TNT	TNT 27-B-1	3.5	Wo 3.5			
TNT	TNT 27-C	70.0	EbB 34.0	EhB 26.0	EbC 5.0	Ba 2.0
			VbA 2.0	Wo 1.0		
TNT	TNT 27-D	63.4	EhB 22.0	EbB 16.0	WeA 16.0	BdA 4.0
			EbA 4.0	Ba 1.0	VbA 0.4	
TNT	TNT 34-A	102.2	EbB 37.2	EhB 35.0	Ba 10.0	VbA 8.0
			Wh 5.0	Wo 5.0	EbA 2.0	
TNT	TNT 34-A-1	4.5	Wo 4.5			
TNT	TNT 34-B	6.4	EbB 3.0	EhB 3.0	EaC 0.4	
TNT	TNT 34-C	10.0	EbB 4.0	EhB 3.0	EaC 2.5	Wo 0.5
TNT	TNT 34-D	11.7	EhB 5.0	EbB 3.0	Wh 2.7	VbA 1.0
TNT	TNT 34-E	26.0	MARSH			
TNT	TNT 34-F	88.3	EhB 42.0	EaC 14.0	VgB 12.0	ScA 6.0
			SdB 5.3	Wh 4.0	EeC2 3.0	VbA 2.0
TNT	TNT 34-G	52.0	EhB 22.0	Wh 15.0	EbC 7.0	EeC2 6.0
			VgB 2.0			
TNT	TNT 34-H	40.6	EeC2 7.0	Wh 7.0	VbA 7.0	EhB 7.0
			EbB 7.0	EaC 5.0	Wo 0.6	
TNT	TNT 34-I	5.3	Wh 5.3			
TNT	TNT 34-J	15.0	SdB 9.0	EeC2 3.0	EaC 2.0	ScA 1.0

Table 17 - Continued

17.b Conventional (CON)

Mgt. System	Field I.D.	Field Size	Soil Types & Acres per Field			
CON	CON 16-A	27.0	BKC2 11.0	Lp 7.0	KBUB 5.0	Hw 4.0
CON	CON 16-B	28.1	BKC2 16.1	Lp 7.0	KBUB 4.0	Hw 1.0
CON	CON 16-B-1	8.0	BKC2 6.0	KBUB 2.0		
CON	CON 16-B-2	4.0	BKC2 4.0	Hw 1.0	Lp 1.0	
CON	CON 16-C	26.0	KRC2 10.0	Hw 7.0	BKC2 5.0	Lp 4.0
CON	CON 16-C-1	5.0	Hw 4.0	BKC2 1.0		
CON	CON 16-C-2	5.0	KRC2 5.0			
CON	CON 16-C-3	4.0	Lp 4.0			
CON	CON 16-D	13.0	BKC2 13.0			
CON	CON 16-D-1	5.0	BKC2 5.0			
CON	CON 16-E	8.1	KRB 3.6	Lp 3.0	Pa 1.5	
CON	CON 16-F	20.0	KRB 9.0	BKC2 8.0	Lp 2.0	Hw 1.0
CON	CON 16-G	3.0	KRB 3.0			
CON	CON 15-A	15.6	BKC2 6.0	Hw 3.6	KRC2 3.0	KRB 2.0
			BKD2 1.0			
CON	CON 15-A-1	6.0	BKC2 6.0			
CON	CON 15-B	12.0	KRC2 8.0	Lp 2.0	Pa 1.0	BKC2 1.0
CON	CON 15-C	7.9	BKD2 7.9			
CON	CON 15-D	20.9	KRC2 17.9	La 1.0	Pa 1.0	Hw 1.0
CON	CON 15-D-1	9.0	KRC2 8.0	La 1.0		
CON	CON 15-D-2	4.0	KRC2 4.0			
CON	CON 15-E	14.1	KRC2 5.1	KrB 4.0	Be 3.0	BKC2 1.0
			Hw 1.0			
CON	CON 15-F	20.8	BKC2 15.8	Be 2.0	Hw 2.0	Lp 1.0
CON	CON 15-F-1	5.0	BKC2 4.0	Lp 1.0		
CON	CON 21-A	32.0	BKC2 22.0	KrB 5.0	Lp 3.0	Hw 2.0
CON	CON 21-A-1	1.0	Hw 1.0			
CON	CON 21-A-2	1.0	Hw 1.0			
CON	CON 21-A-3	6.0	KrB 4.0	BKC2 2.0		
CON	CON 21-A-4	9.0	BKC2 5.0	Lp 2.0	KrB 1.0	Hw 1.0
CON	CON 21-B	79.0	BKC2 48.0	KrB 13.0	Hw 10.0	Lp 8.0
CON	CON 21-B-1	13.0	BKC2 13.0			
CON	CON 21-B-2	26.0	KrB 13.0	BKC2 11.0	Lp 2.0	
CON	CON 21-B-3	13.0	BKC2 9.0	Hw 4.0		
CON	CON 21-B-4	3.0	BKC2 3.0			
CON	CON 21-B-5	24.0	BKC2 13.0	Lp 7.0	Hw 3.0	KrB 1.0
CON	CON 21-C	20.5	BKC2 18.5	Lp 2.0		
CON	CON 21-C-1	5.0	BKC2 5.0			

Table 17 - Continued

17.c Organic (ORG)

Mgt. System	Field I.D.	Field Size	Soil Types & Acres per Field			
ORG	ORG 36-A	20.6	EbB 9.6	Wh 4.0	EhB 4.0	EtD 3.0
ORG	ORG 36-A-1	7.3	EbB 6.0	Wh 1.3		
ORG	ORG 36-B	7.3	Wh 4.0	EeC2 3.3		
ORG	ORG 36-C	7.1	SdB 4.0	Wh 2.0	Te 1.1	
ORG	ORG 36-D	6.7	ScA 4.0	EgA 2.0	SdB 0.7	
ORG	ORG 36-E	18.7	EeC2 7.0	Ba 6.7	Wh 5.0	
ORG	ORG 36-F	10.0	EhB 5.5	Wo 2.0	Ba 1.5	SdB 0.5
			EeC2 0.5			
ORG	ORG 36-G	9.0	EbB 5.0	SdB 2.0	Ba 2.0	
ORG	ORG 36-H	22.7	Ba 10.7	EhB 4.0	EbB 3.0	Wo 3.0
			SdB 2.0			
ORG	ORG 26-A	36.3	EbB 10.0	EgA 9.3	Ba 9.0	Wh 7.0
			Te 1.0			
ORG	ORG 26-B	27.0	EeC2 9.0	Wh 9.0	EbB 5.0	SdB 4.0
ORG	ORG 26-C	31.0	SdB 18.0	EeC2 9.0	EbB 4.0	
ORG	ORG 26-D	8.8	Wo 4.0	EeC2 2.0	Te 1.8	Wh 1.0
ORG	ORG 26-E	32.0	EbB 16.0	EeC2 7.0	Wh 5.0	Wo 2.0
			Ba 2.0			
ORG	ORG 26-E-1	4.0	EbB 2.0	Te 2.0		
ORG	ORG 26-F	29.0	EbB 20.0	EeC2 9.0		
ORG	ORG 26-G	14.6	EeB 5.0	BdA 5.0	EbB 4.6	
ORG	ORG 26-H	15.0	EeC2 9.0	EbA 2.0	ScA 2.0	SdB 2.0
ORG	ORG 26-I	16.4	ScA 9.0	SdB 7.4		
ORG	ORG 26-J	4.1	Ba 4.1			
ORG	ORG 26-K	21.5	ScA 9.0	EeC2 6.0	Wo 3.5	CeD 3.0
ORG	ORG 26-L	8.0	SdB 4.0	EeC2 4.0		
ORG	ORG 26-M	28.4	EeC2 16.0	Ba 4.4	ScA 4.0	EbB 3.0
			SdB 1.0			
ORG	ORG 25-A	29.0	EbB 12.5	Wh 7.5	EhB 4.0	Ba 3.0
			Wo 2.0			
ORG	ORG 25-B	25.4	EbB 10.0	EeC2 8.0	Ba 4.0	EhB 3.4
ORG	ORG 25-B-1	10.0	EhB 3.5	EeC2 3.5	EbB 3.0	
ORG	ORG 25-C	31.9	EeC2 12.4	EbB 10.0	Ba 5.5	Wh 4.0
ORG	ORG 25-C-1	14.0	EeC2 6.5	Ba 5.5	EbB 2.0	
ORG	ORG 25-D	8.7	EeC2 8.7			
ORG	ORG 25-E	32.0	EbB 7.5	Ba 3.5	Wh 12.0	EeC2 9.0
ORG	ORG 24-A	13.3	EbB 8.0	EeC2 3.0	Wh 2.3	
ORG	ORG 24-B	16.8	VgB 8.8	Ba 4.0	EhB 2.0	La 1.0
			Wh 1.0			
ORG	ORG 24-C	39.2	EhB 30.7	EbB 6.0	VbA 1.5	VgB 1.0
ORG	ORG 24-D	38.1	EhB 13.5	EgA 8.0	VgB 7.0	VbA 5.6
			Wh 2.0	EbB 2.0		
ORG	ORG 24-E	34.0	Wh 12.5	WeA 9.5	VbA 6.5	EhB 3.5
			EgA 2.0			
ORG	ORG 24-F	17.6	La 9.0	CeD 6.6	La 1.0	EbC 1.0

Table 18 Soil Classification Data For Field Tract Acres
by Farming System

18.a Transitional No-till(TNT) 767.4 Acres Cropland

Soil Types				
Map Symbol	Map Name	Acres	Land Capability Subclass	% Slope
EhB	Egan/Wentworth	254.0	2e	2-6
EbB	Egan/Beadle	163.2	2e/3e	2-6
* Wh	Whitewood	74.8	2w	0-2
VbA	Viborg	54.1	1	0-2
EaC	Egan	37.6	3e	6-9
* Marsh	Worthing Poned	26.0	8w	0-1
EeC2	Egan/Ethan (eroded)	25.0	4e/6e	6-9
EgA	Ethan/Viborg	24.0	1	0-3
* Wo	Worthing (undrained)	19.9	5w	0-1
* Ba	Badus	19.5	2w	0-2
EbC	Egan/Beadle	19.0	3e	6-9
WeA	Wentworth/Egan	19.0	1	0-2
VgB	Viborg/Egan	16.0	2e	2-6
SdB	Sinai	14.3	3e	2-6
EsE	Ethan/Clarno (stony)	9.5	7s/6e	6-25
ScA	Sinai	7.0	2s	0-2
EbA	Egan/Beadle	6.0	1/2s	0-2
BdA	Beadle	4.0	2s	0-2
* Te	Tetonka (undrained)	0.5	4w	0-1

* Indicates hydric soils

18.b Conventional (CON) 348.0 Acres Cropland

Soil Types				
Map Symbol	Map Name	Acres	Land Capability Subclass	% Slope
BkC2	Ethan/Egan (eroded)	165.4	4e	5-9
KrC2	Egan/Ethan (eroded)	44.0	3e/4e	5-9
KrB	Egan	39.6	2e	3-5
* Lp	Trent/Chancellor	39.0	1/2w	0-2
* Hw	Whitewood	32.6	2w	0-2
KBuB	Egan/Ethan	9.0	2e/3e	3-5
BKD2	Ethan/Clarno (eroded)	8.9	6e/4e	9-17
Be	Trent	5.0	1	0-2
* Pa	Worthing (undrained)	3.5	5w	0-1
* La	Lamo	1.0	2w	0-2

* Indicates hydric soils

Table 18 - Continued

18.c Organic (ORG) 621.7 Acres Cropland

Soil Types		Acres	Land	% Slope	
Map Symbol	Map Name		Capability Subclass		
	EbB	Egan/Beadle	136.2	2e/3e	2-6
	EeC2	Egan/Ethan (eroded)	116.9	4e/6e	6-9
*	Wh	Whitewood	77.3	2w	0-2
	EhB	Egan/Wentworth	70.6	2e	2-6
*	Ba	Badus	56.3	2w	0-2
	SdB	Sinai	41.6	3e	2-6
	ScA	Sinai	28.0	2s	0-2
	EgA	Egan/Viborg	21.3	1	0-3
	VgB	Viborg/Egan	16.8	2e	2-6
	VbA	Viborg	13.6	1	0-2
*	Wo	Worthing (undrained)	12.5	5w	0-1
	WeA	Wentworth/Egan	9.5	1	0-2
	EeB	Egan/Ethan	5.0	2e/3e	2-6
	BdA	Beadle	5.0	2s	0-2
	EtD	Ethan/Davis (stony)	3.0	7s/2e	3-21
	CeD	Clarno/Ethan	3.0	4e/6e	9-16
*	Te	Tetonka	2.1	4w	0-1
	EbA	Egan/Beadle	2.0	1/2s	0-2
*	La	Lamo	1.0	2w	0-2

* Indicates hydric soils

Table 19 Wetland Acreage Inventory by Management System

Mgt. System	Section	Total Acres	Cropland Acres	Total Wetland Acres	Breakdown of Wetland Acres				
					PEMA	PEMC	PLM/ABF	PABF	PFO/EMA
TNT	SE 1/4 23-105-53	160.0	108.4	4.28	1.06	2.94	-	0.28	-
TNT	SW 1/4 24-105-53	160.0	119.5	3.11	-	2.73	-	0.38	-
TNT	NE 1/4 & E 1/2 SE 1/4 27-105-53	240.0	208.0	21.59	4.70	5.97	10.65	-	0.27
TNT	NE 1/4 & E 1/2 SE 1/4 34-105-53	400.0	331.5	37.49	1.41	4.14	31.94	-	-
Totals		960.0	767.4	66.47	7.17	15.78	42.59	0.66	0.27
CON	SW 1/4 15-104-52	160.0	91.3	24.07	5.99	12.90	4.97	0.21	-
CON	SE 1/4 16-104-52	160.0	125.2	10.31	1.70	8.06	-	-	0.55
CON	NE 1/4 21-104-52	160.0	131.5	17.71	7.04	1.31	9.09	0.12	0.15
Totals		480.0	348.0	52.09	14.73	22.27	14.06	0.33	0.7
ORG	SE 1/4 24-105-53	160.0	141.4	2.86	2.42	0.44	-	-	-
ORG	NE 1/4 25-105-53	160.0	127.0	2.35	0.32	1.59	-	0.44	-
ORG	W 1/2 & W 1/2 SE 1/4 26-105-53	400.0	251.2	63.98	3.01	8.01	52.96	-	-
ORG	N 1/2 NE 1/4 & SE 1/4 NE 1/4 36-105-53	120.0	102.1	19.60	4.96	14.43	-	0.21	-
Totals		840.0	621.7	88.79	10.71	24.47	52.96	0.65	0

Description of Wetland Type:

PEMA = Emergent Temporarily Flooded

PEMC = Emergent Seasonally Flooded

PEM/ABF = Emergent/Aquatic Semipermanently Flooded

PABF = Aquatic Semipermanently Flooded

PFO/EMA = Forested/Emergent Temporarily Flooded

Table 20. Description of project wetlands.

Wetland No.	Wetland Class	Farming System	Traditionally Farmed-Through
1	Temporary	Organic	Yes
2	Seasonal	Organic	Yes
3	Seasonal	Organic	No
4	Seasonal	Organic	No
5	Semi-Permanent	Organic	No
6	Seasonal	Transitional No-Till	No
7	Temporary	Transitional No-Till	Yes
8	Semi-Permanent	Transitional No-Till	No
9	Seasonal	Transitional No-Till	No
11	Seasonal	Conventional	Yes
12	Seasonal	Conventional	Yes
13	Semi-Permanent	Conventional	No

Table 21 - Sample Field Budget

ary Budget Report - Budget EC-200-, Field TNT 23-B, 448 Bushels of Soybeans
 is 14 acres of TNT 23-B at Owned, No-till Tillage
 Residue Management, No Conservation Plan, No Management Charge Specified
 Prepared for Planning Purposes Only.

1. Gross Receipts From Production				
	Unit	Price /Unit	Quantity	Value / Acre
Soybeans	Bushels	5.250	32.00	168.00
Total Receipts				168.00

2. Production Activities Report									
Date	Operation Description	Performance rate Acres/hr	Power Unit -- Owner-ship	Unit -- Operating	Machinery --- Owner-ship	Operating	Labor Cost	--- Cost Per Acre	--- Unit
Pre-Harvest Activities									
05/03/92	Sprayer Self-propelled 60'	30.727	17.15	13.29	0.00	0.00	3.55	2.43	0.076
05/10/92	No-Till Drill 30'	13.606	13.72	13.30	78.29	23.36	7.75	9.78	0.306
05/10/92	Sprayer Self-propelled 50'	30.727	17.15	13.29	0.00	0.00	3.55	2.43	0.076
Pre-Harvest SubTotal			48.03	40.89	78.29	23.36	14.85	14.64	0.457
Harvest Activities									
10/10/92	Combine head Soybean, Large	5.303	148.25	56.61	25.04	5.64	21.55	13.44	0.576
10/10/92	Truck - tandem	9.697	0.96	5.65	0.00	0.00	2.25	0.85	0.026
Harvest SubTotal			152.22	62.25	25.04	5.64	23.90	19.29	0.603
Total Cost of Operations			200.25	102.65	103.33	30.01	38.76	33.93	1.060

3. Material Usage Report:					
	Units	Quantity	Total Costs	--- Cost Per Acre	--- Unit
Materials Used					
2,4-D 5.7E	Pints	14.00	29.54	2.11	0.066
Roundup RT 3L	Ounces	34.00	27.72	1.98	0.062
Soybean Seed, \$.201b	Pounds	1120.00	224.00	16.00	0.500
Fusion	Ounces	55.00	64.40	4.60	0.144
Pursuit 2L	Ounces	55.00	259.84	18.56	0.580
Crop Ins-CON beans	Acres	14.00	57.40	4.10	0.128
Trucking charge	Bushels	448.00	35.84	2.55	0.080
Storage cost (grain)	Bushels	448.00	44.80	3.20	0.100
Labor Used					
Machinery Labor	Hours	5.74	37.29	n/a	n/a
Other Labor	Hours	0.22	1.47	n/a	n/a
Fuels Used					
Gasoline	Gallons	13.67	13.67	n/a	n/a
Diesel	Gallons	33.67	28.62	n/a	n/a
Total Cost of Inputs			743.54	53.11	1.660

4. Other Operating Costs				
Interest On Operating Capital	62	25.40	1.39	0.059
Crop Drying Costs		0.00	0.00	0.000

Table 22 Machinery Inventory by Management System, 1992

(TNT) Machinery Used in Budgets

120 hp tractor	combine
170 hp tractor FWA	15' 6RN corn head (30")
140 hp tractor	25' soybean head
30' 12RN minimum till corn planter (30")	30' no-till drill 2-15's
30' 12RN anhydrous tool bar	18' self-propelled swather
3RN silage chopper (30")	large round baler
18' forage wagon	bale hauler
350 bu. tandem truck	8' rake
21' tandem disk	fertilizer spreader
	60' self propelled sprayer

(CON) Machinery Used in Budgets

140 hp tractor 2WD	2RW forage harvester
100 hp tractor 2WD	pull-type (38")
55 hp tractor 2WD	12' forage wagon
fertilizer spreader	3 ton stackwagon
19' field cultivator	3 ton stackmover
19' drag	5 x 16" moldboard plow
19' tandem disk	4RW corn planter (38")
185 bu. gravity wagon	4RW cultivator (38")
8' baled hay racks	2RW corn picker (38")
12' press drill	2RW corn picker/sheller (38")
12' stalk chopper	38' pull-type sprayer
14' haybine self-propelled	500 bu. manure spreader
8' rake	

(Org) Machinery Used in Budgets

140 hp tractor 2WD	7' large round baler
100 hp tractor 2WD	8' baled hay racks
75 hp tractor 2WD	240 bu. gravity wagon
32' drag	20' drag
20' tandem disk	12' press drill
18' field cultivator	combine 2WD
20' 8RN corn planter (30")	20' soybean lead
20' rotary hoe	15' grain pickup head
20' 8RN cultivator (30")	10' 4RN corn head (30")
16' chisel plow	small square baler
15' swather self-propelled	9' sickle mower
8' rake	

Table 23 Whole Farm Crop Budget Summary, 1992

Transitional No-till (TNT)

(Per Acre)	Corn	Corn Silage	Soybeans	Alfalfa	Set Aside	Total
Crop Distribution...	400	40	395	160	35	1030
Gross Income.....	240.73	298.23	168.00	250.00	9.00	
Operating Costs.....	68.35	67.22	37.18	58.14	13.69	
Input Costs.....	90.22	129.52	53.11	12.30	1.41	
Total Costs.....	158.56	196.75	90.29	70.43	15.10	
Land & Mgt Return...	82.17	101.48	77.71	179.57	-6.10	
Land Charge.....	51.75	51.75	51.75	51.75	51.75	
Total Crop Costs....	210.31	248.50	142.04	122.18	66.85	
Net Return.....	30.42	49.73	25.96	127.82	-57.85	
Net Return (Crop)...	12168.00	1989.20	10254.20	20451.20	-2024.85	42837.85
Totals: Whole Farm Average (acre)						
Gross Income.....	208.64					
Total Costs.....	115.30					
Land & Mgt Return...	91.47					
Net Return Over All Costs.....	41.59					

Table 24 Whole Farm Crop Budget Summary, 1992

Conventional (CON)

(Per Acre)	Corn	Corn Silage	Soybeans	Alfalfa	Set Aside	Oats	Total
Crop Distribution...	195	35	44	58	12	9	353
Gross Income.....	268.98	341.48	173.25	175.00	25.00	153.62	
Operating Costs.....	80.36	100.90	28.91	67.45	49.24	21.90	
Input Costs.....	95.07	113.12	59.13	8.46	39.00	82.20	
Total Costs.....	175.42	214.02	88.04	75.91	88.24	104.10	
Land & Mgt Return...	93.56	127.46	85.21	99.09	-63.24	49.52	
Land Charge.....	51.75	51.75	51.75	51.75	51.75	51.75	
Total Crop Costs....	227.17	265.77	139.79	127.66	139.99	155.85	
Net Return.....	41.81	75.21	33.46	47.34	-114.99	-2.23	
Net Return (Crop)...	8152.95	2649.85	1472.24	2745.72	-1379.88	-20.07	13620.81
 Totals: Whole Farm Average (acre)							
Gross Income.....	237.56						
Total Costs.....	147.22						
Land & Mgt Return...	90.34						
Net Return Over All Costs.....	38.59						

Table 25 Whole Farm Crop Budget Summary, 1992

Organic (ORG)

(Per Acre)	Corn	Soybeans #1	Soybeans #2	Alfalfa #1	Alfalfa #2	Wheat/w Alfalfa	Oats/w Alf #1	Oats/w Alf #2	Rye #1	Rye #2	Total
Crop Distribution...	163	260	17	182	6	31	128	3	6	10	806
Gross Income.....	200.14	137.97	137.97	165.00	82.50	159.46	111.59	84.79	100.6	76.30	
Operating Costs.....	82.26	52.04	65.54	59.57	18.22	59.84	59.00	59.00	48.28	48.28	
Input Costs.....	43.77	34.00	38.00	0.00	0.00	26.50	25.54	25.54	3.96	3.96	
Total Costs.....	126.02	86.05	103.55	59.57	18.22	86.34	84.54	84.54	52.24	52.24	
Land & Mgt Return...	74.12	51.92	34.42	105.43	64.28	73.12	27.05	0.25	48.36	24.06	
Land Charge.....	51.75	51.75	51.75	51.75	51.75	51.75	51.75	51.75	51.75	51.75	
Total Crop Costs....	177.77	137.80	155.30	111.32	69.97	138.09	136.29	136.29	103.99	103.99	
Net Return.....	22.37	0.17	-17.33	53.68	12.53	21.37	-24.70	-51.50	-3.39	-27.69	
Net Return (Crop)...	3646.31	44.20	-294.61	9769.76	75.18	662.47	-3161.60	-154.50	-20.34	-276.90	10289.97

Totals: Whole Farm Average (acre)

Gross Income.....	151.63
Total Costs.....	87.11
Land & Mgt Return...	64.52
Net Return Over All Costs.....	12.77

Table 26 Explanation of Organic Crop Enterprises

<u>CORN</u> (full defc. pmts.) -	163 acres
<u>SOYBEANS #1</u> (without rye sown in fall)	260 acres
<u>SOYBEANS #2</u> (with rye sown in fall)	17 acres
<u>WHEAT w/ ALFALFA</u> (full defc. pmts.)	31 acres
<u>OATS w/ ALFALFA #1</u> (with <u>corn</u> defc. pmts.)	128 acres
<u>OATS w/ ALFALFA #2</u> (with <u>wheat</u> defc. pmts.)	3 acres
<u>ALFALFA #1</u> - that can be harvested for 3 cuttings (83 Flex acres + 94 normal acres + 5 acres set aside)	182 acres
<u>ALFALFA #2</u> - that can only be harvested for 1 cutting (1/2 of 11 set aside acres harvested after Sept. 1)	6 acres
<u>RYE #1</u> (collecting wheat defc. pmts.)	6 acres
<u>RYE #2</u> (without defc pmts--counts as set aside)	10 acres
10 crop Enterprises with a total of.....	806 acres

Resource Conserving Crop - 20% of Crop Acreage Base

Oats - $128.6 * 20\% = 25.7$ or 26 acres devoted to RCC. Since all oats were seeded with alfalfa, this qualifies as RCC.

Wheat - $63.3 * 20\% = 12.6$ or 13 acres devoted to RCC. 3 of the 13 acres are designated as set aside and are maintained in rye. The other 10 acres are designated as Flex acres and are maintained in alfalfa.

Corn - $362.9 * 20\% = 72.48$ or 72 acres devoted to RCC. 18 of the 72 acres are designated as set-aside and are maintained in rye and alfalfa. The other 52 acres designated as normal Flex acres and are maintained in alfalfa.

* This table was created by Lon Henning, Research Assistant in the Economics Dept., South Dakota State University.

Table 27 SDSU Collected Yield Data, 1992

Wetland #	Field #	Farmer Reported			SDSU Objective Yields			
		Crop	Wetland Yield	R.O.F. Yield	1st Crop Row	50' Out	100' Out	150' Out
4	Org26-E-1	Soybeans	18	26	13.5	26.3	32.5	22.5
5	Org26-G	Soybeans		15	6.6	14.6	23.5	14.8
6	Tnt27-A	Soybeans		31	14.8	31.0	25.1	38.8
7	Tnt27-A	Soybeans	NA	31	16.2	39.8	35.4	32.9
8	Tnt34-A	Corn		115	16.4	96.6	121.2	106.7
9	Tnt34-A	Corn		115	22.3	67.2	115.0	137.7
11	Con21-A-2	Corn	50	110	27.1	94.6	88.1	97.9
12	Con21-A-1	Corn	0	110	17.6	109.9	127.9	119.5
13	Con21-A-4	Corn		100	74.1	97.2	111.3	135.5

* R.O.F. yield is the farmer reported 1992 crop yield for the field, excluding the reported yield in the farmed-through wetland.

Fig. 1. Above Ground Biomass Production.
(1993 Average)

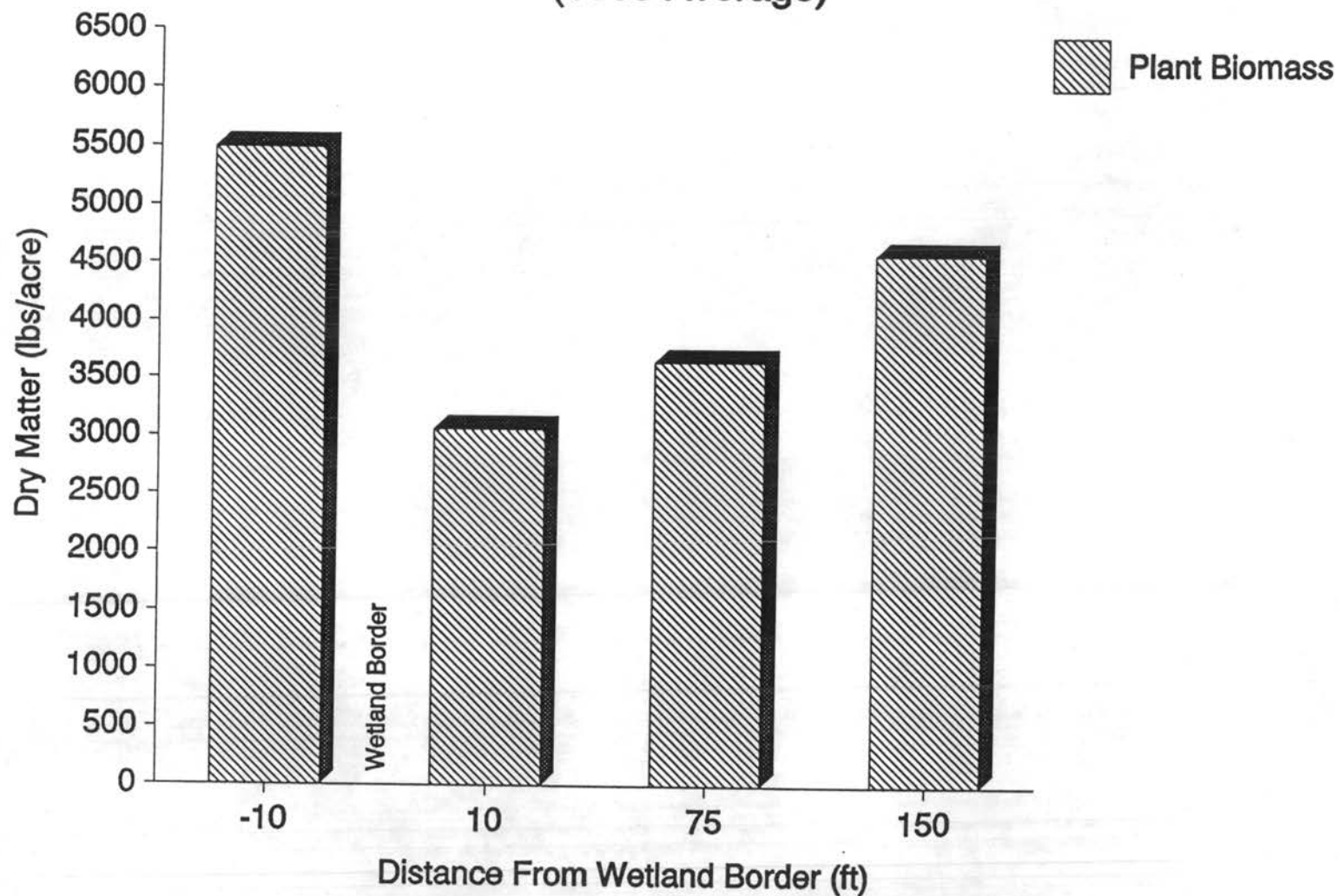
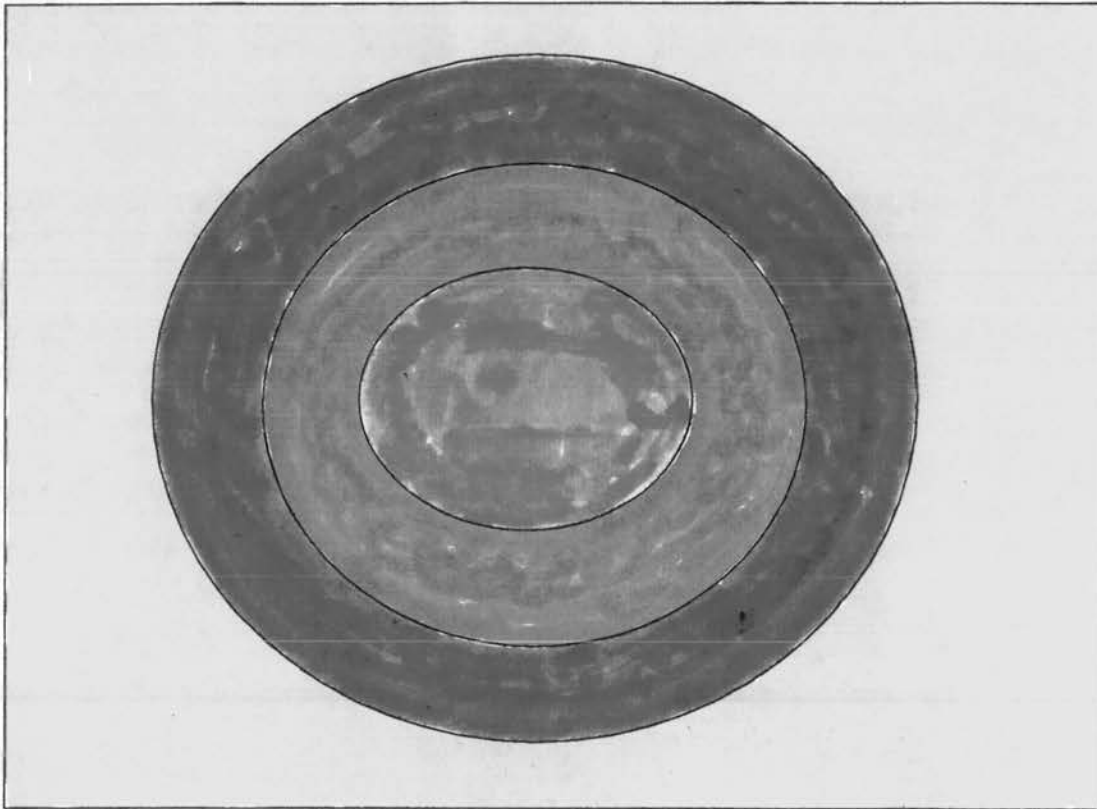


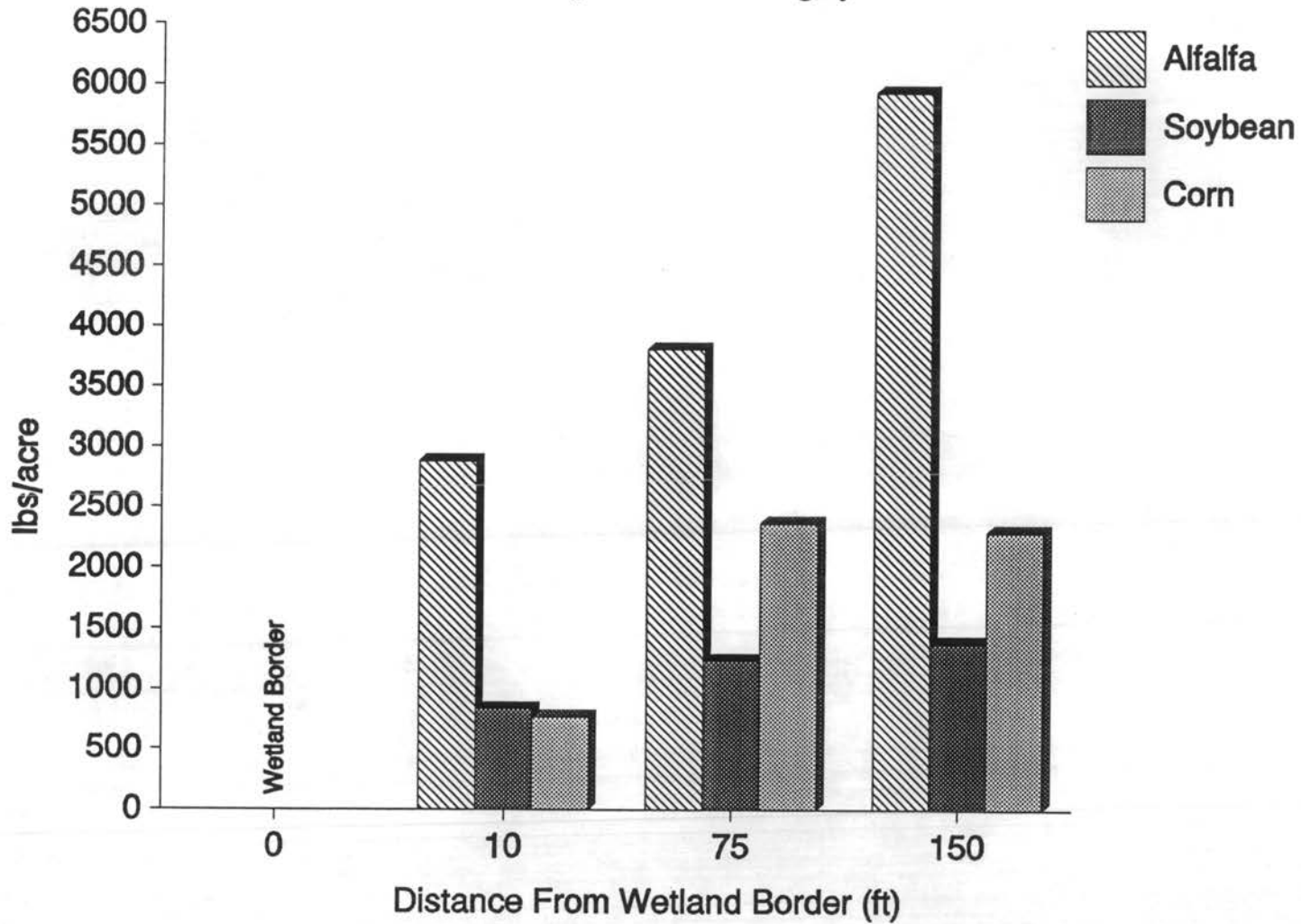
Fig. 2.
An Analysis Of Wetland Field Tracts



		Wetland
0-50'		Negative \$ Return*
50-100'		Positive \$ Return
>100'		Average \$ Return

*The zone of highest environmental risk is also the zone of lowest economic return.

Fig. 3. Crop Yields.
(1993 Average)



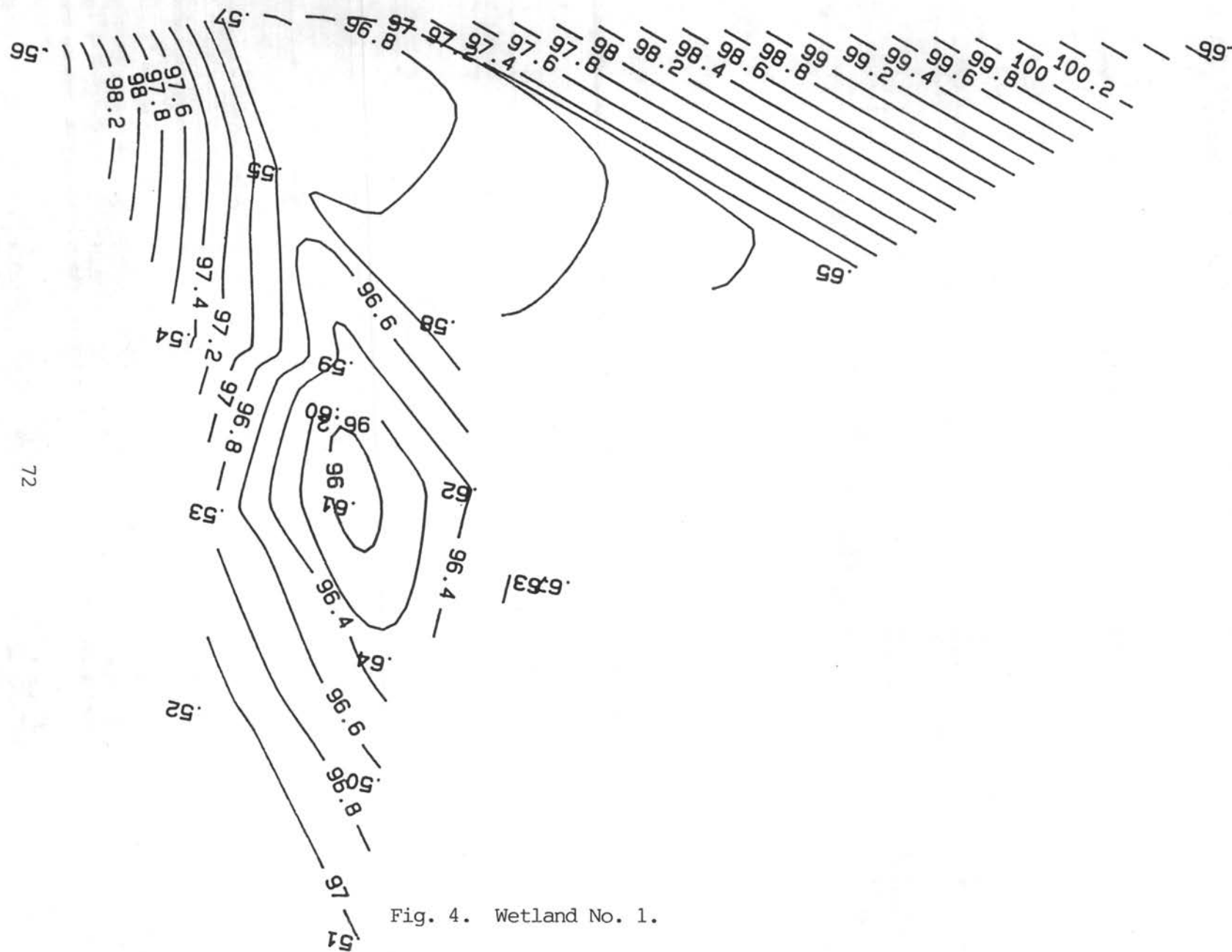


Fig. 4. Wetland No. 1.

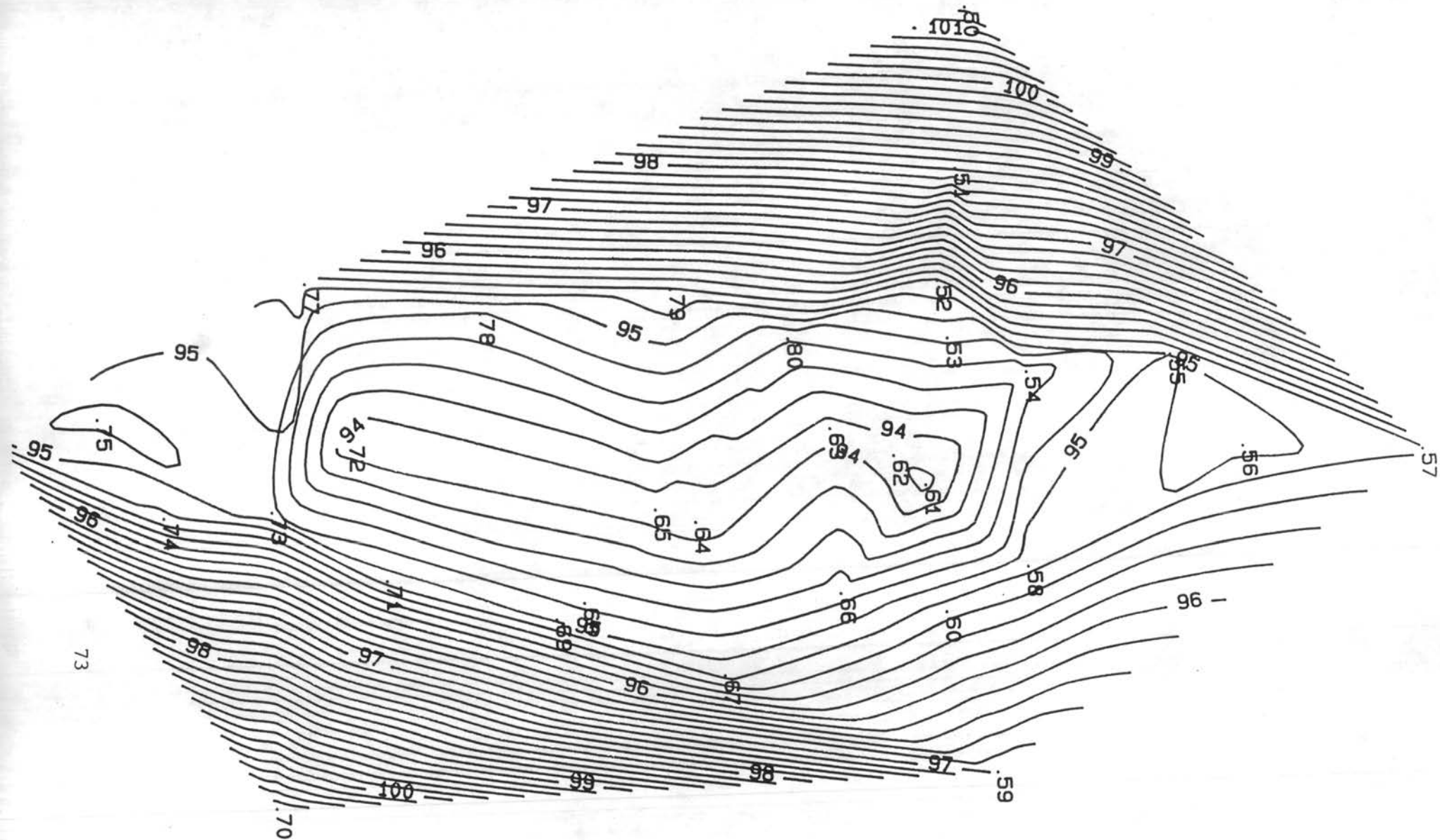


Fig. 5. Wetland No. 2.

74

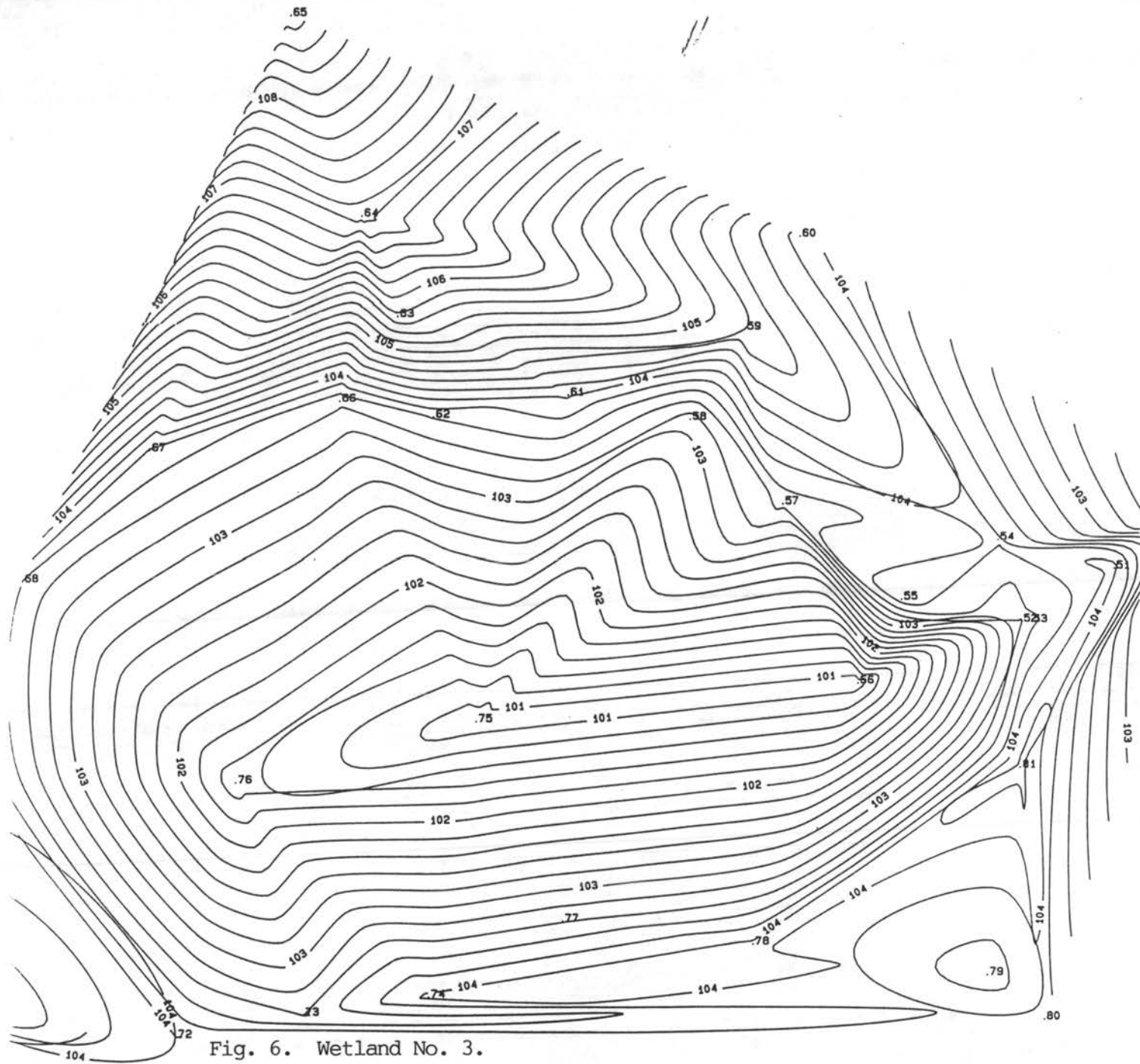


Fig. 6. Wetland No. 3.

75

92

91

92

93

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95

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91

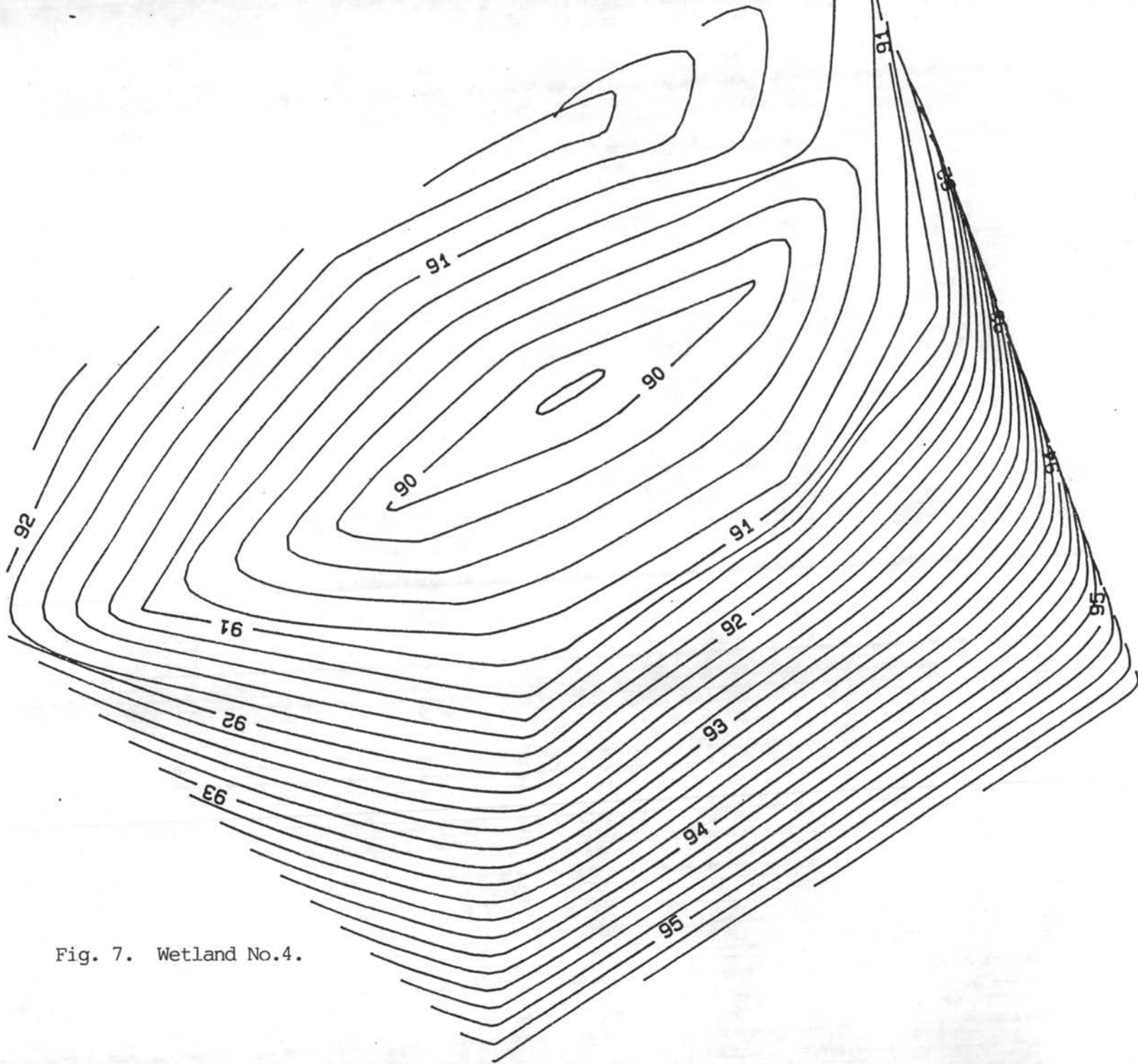
92

93

94

95

Fig. 7. Wetland No.4.



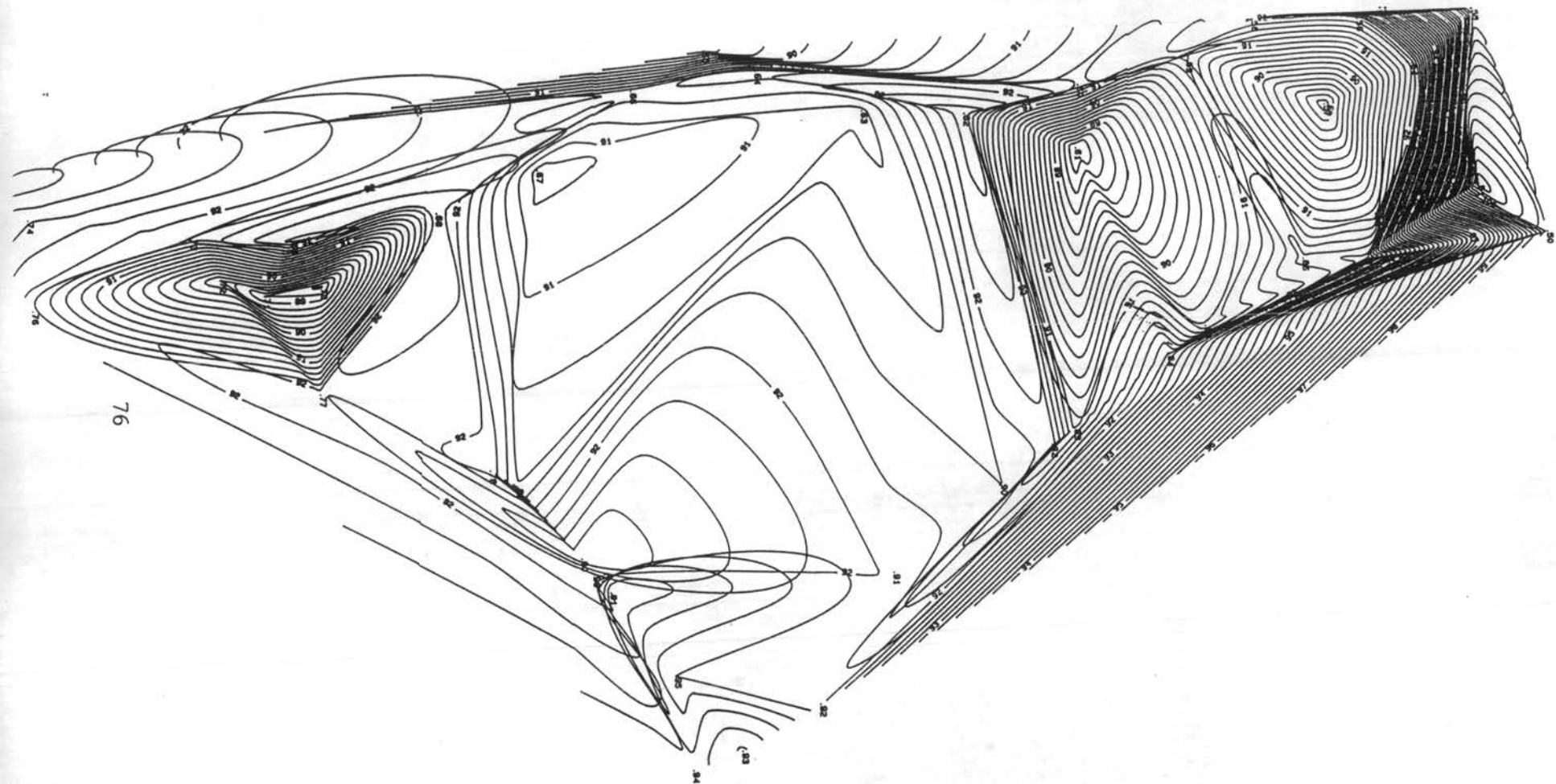


Fig. 8. Wetland No. 5.

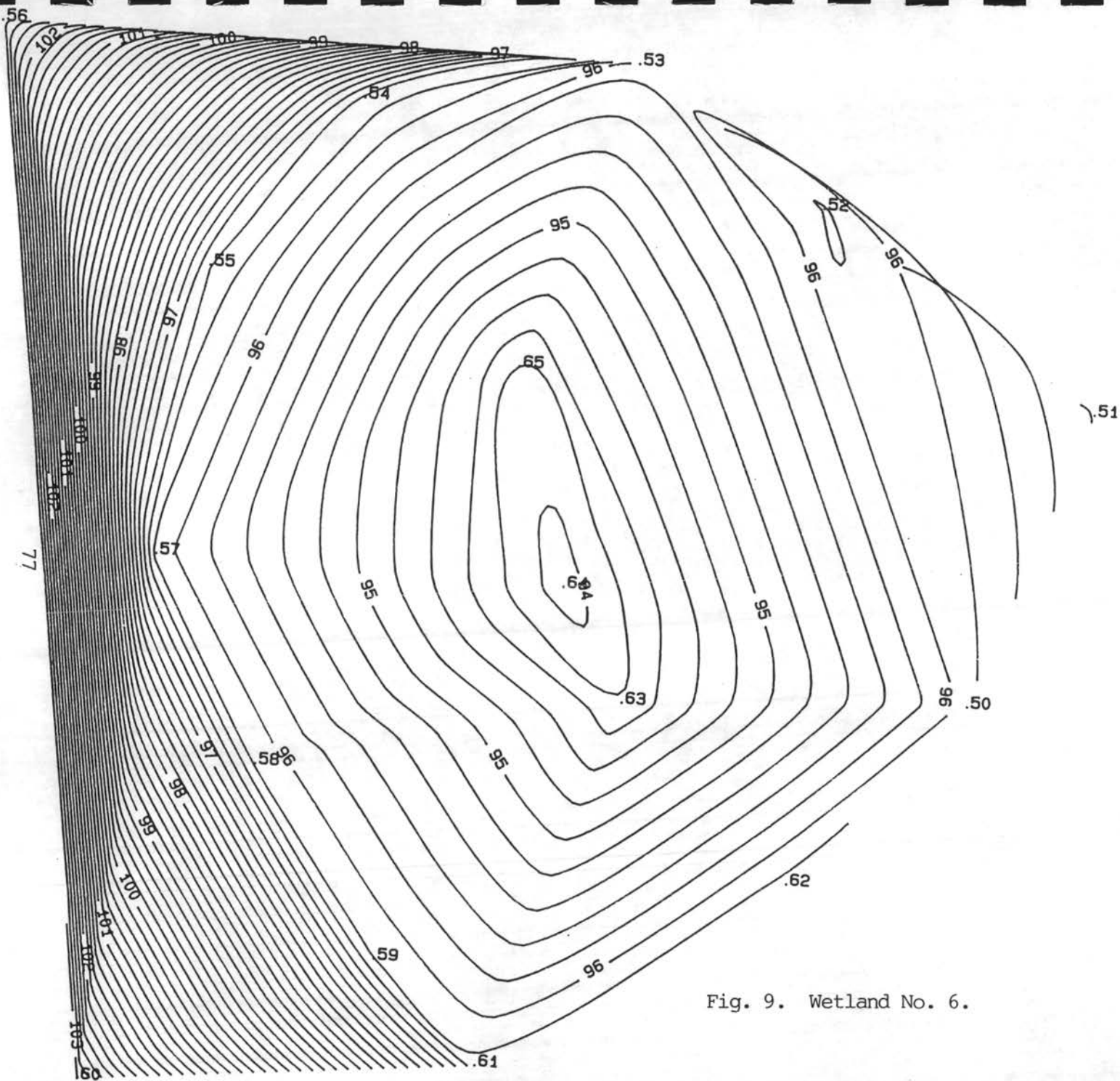


Fig. 9. Wetland No. 6.

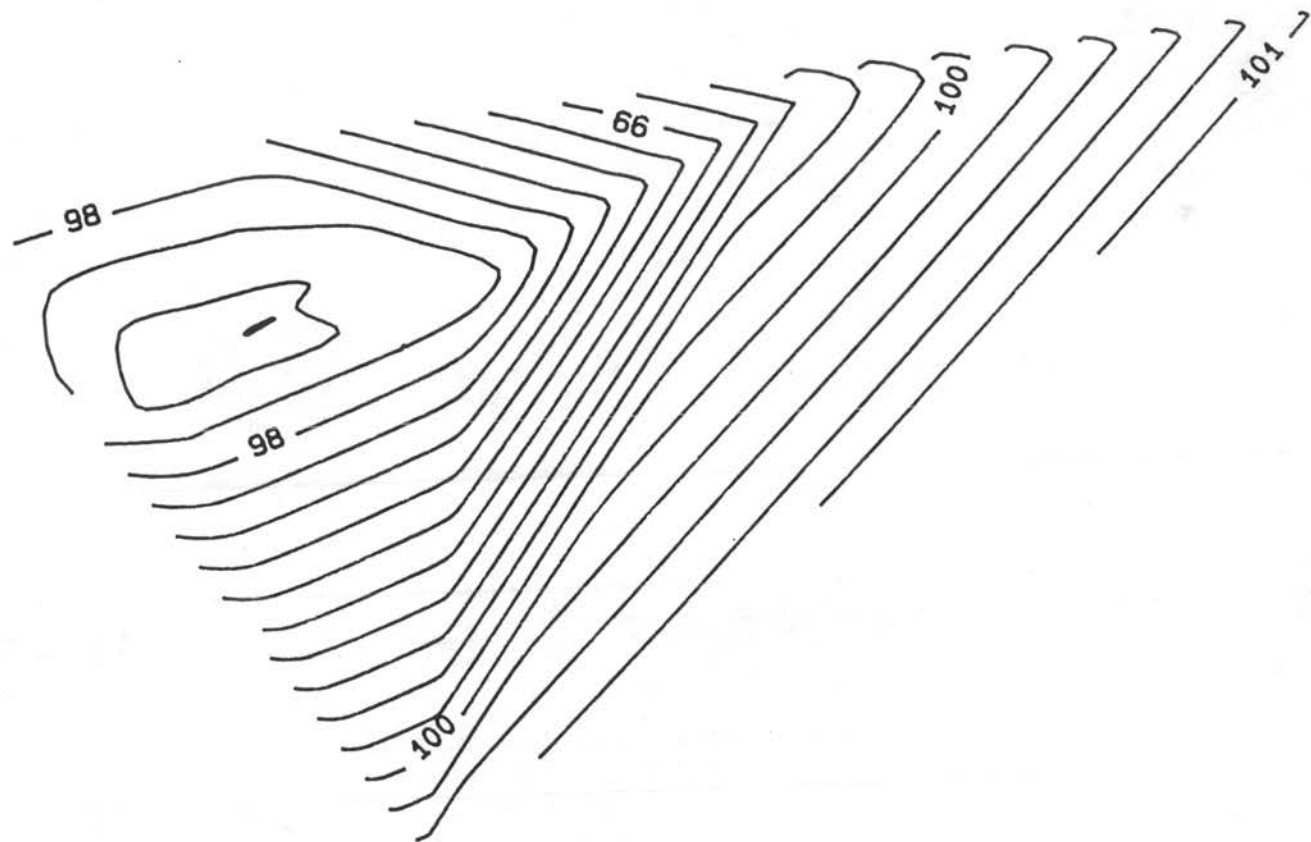


Fig. 10. Wetland No. 7.

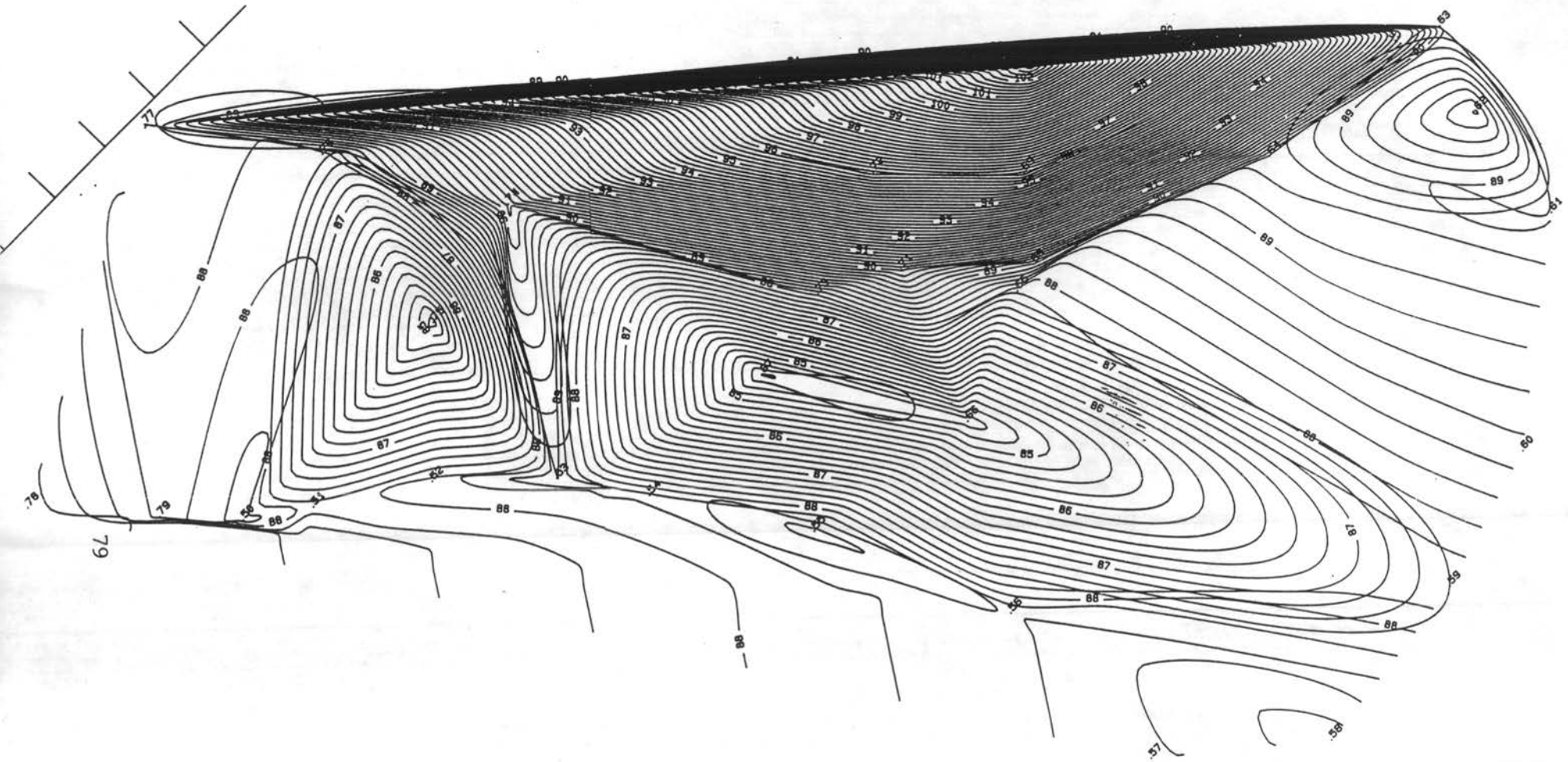


Fig. 11. Wetland No. 8.

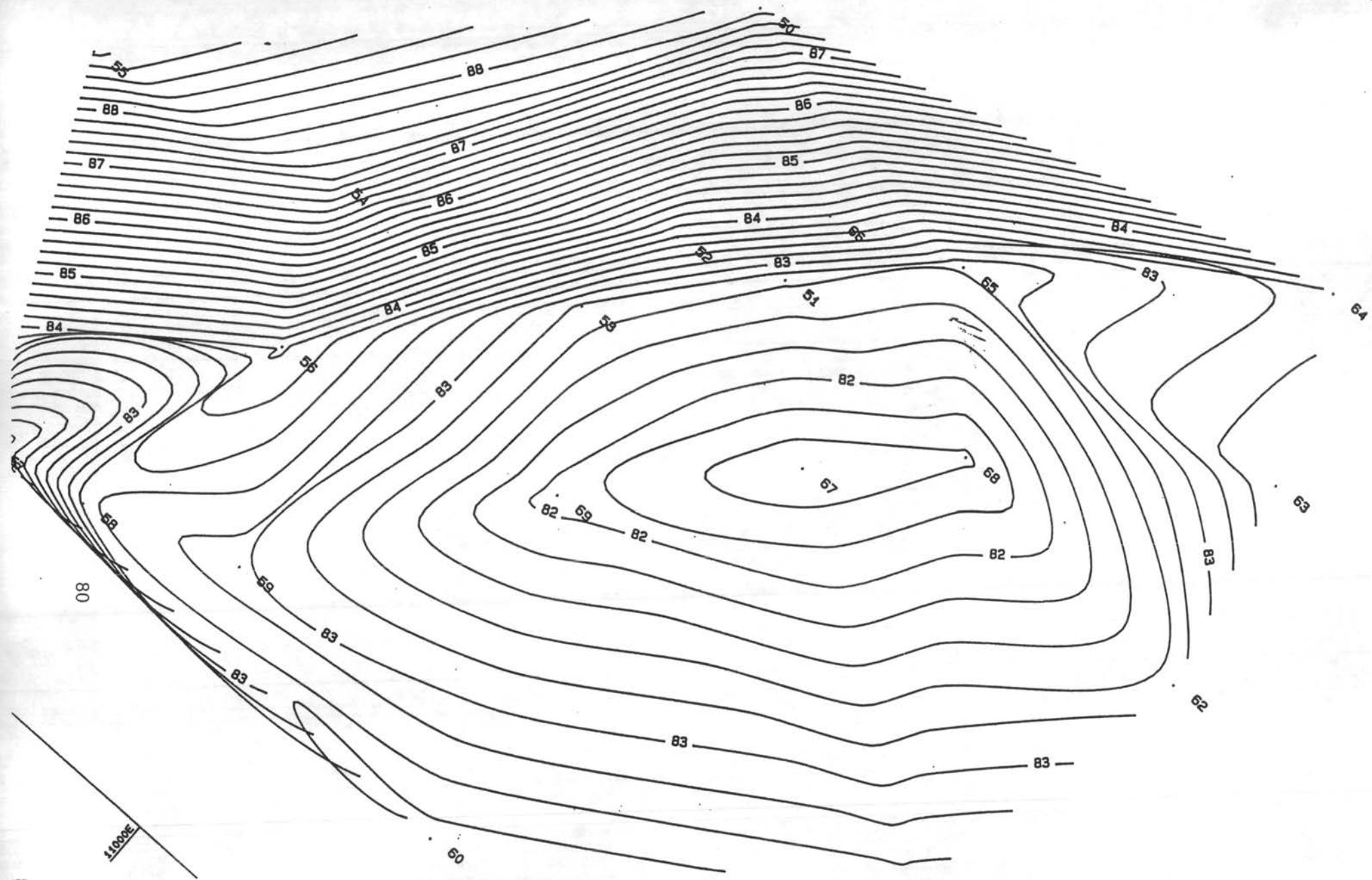


Fig. 12. Wetland No. 9.

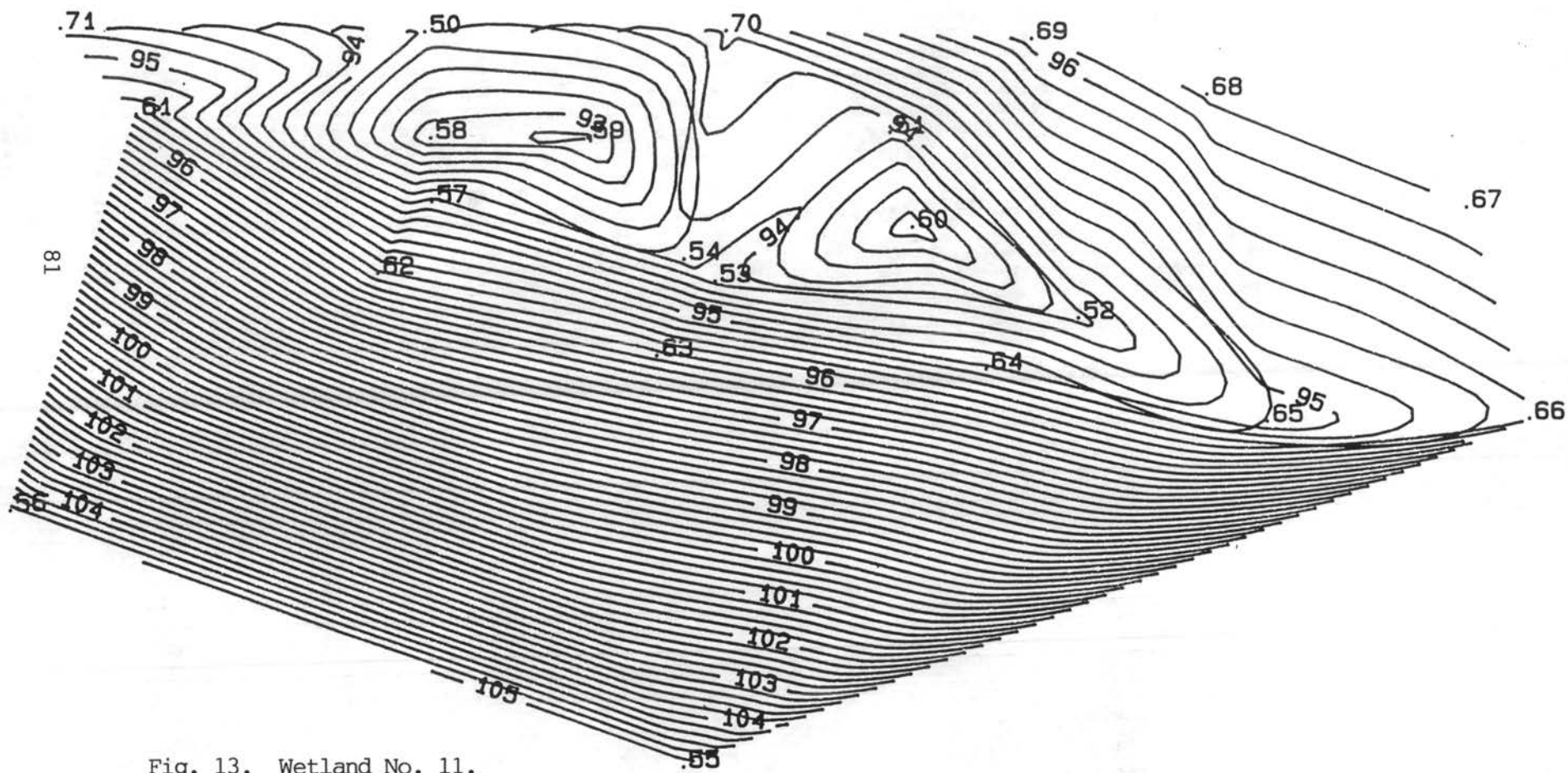
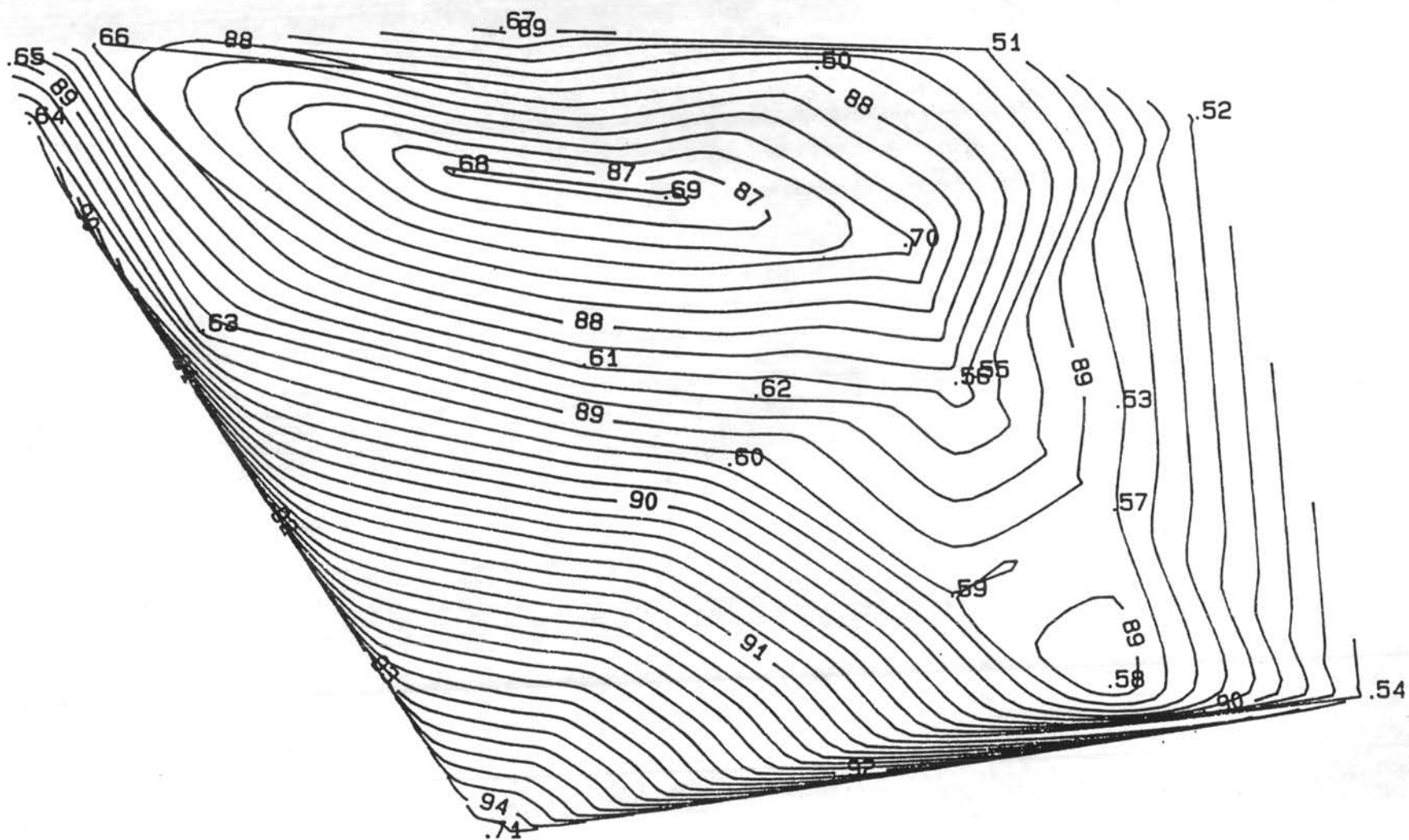


Fig. 13. Wetland No. 11.



82

Fig. 14. Wetland No. 12.

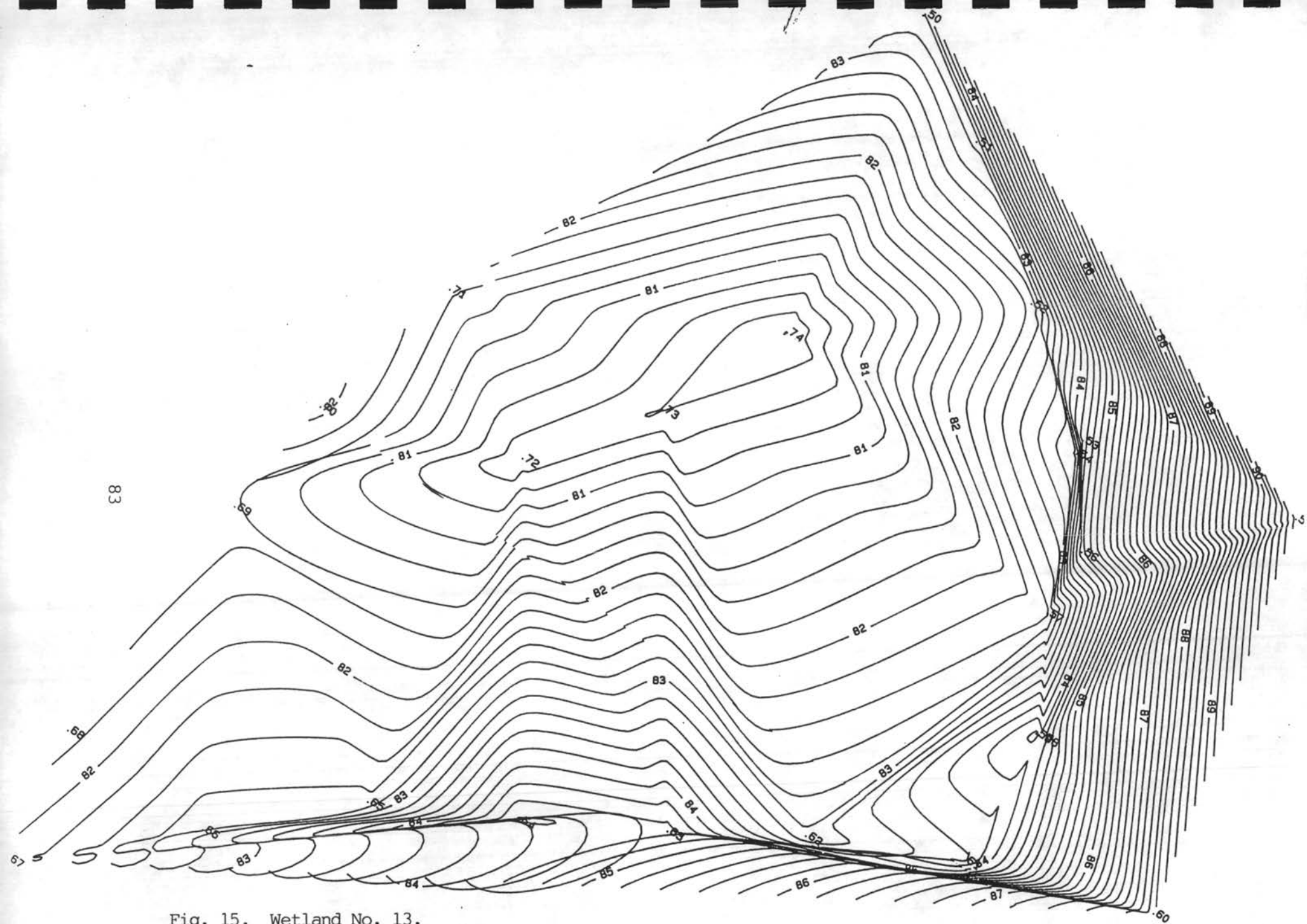


Fig. 15. Wetland No. 13.

Fig. 16. Precipitation.

Nearest Reporting Station: Madison, SD

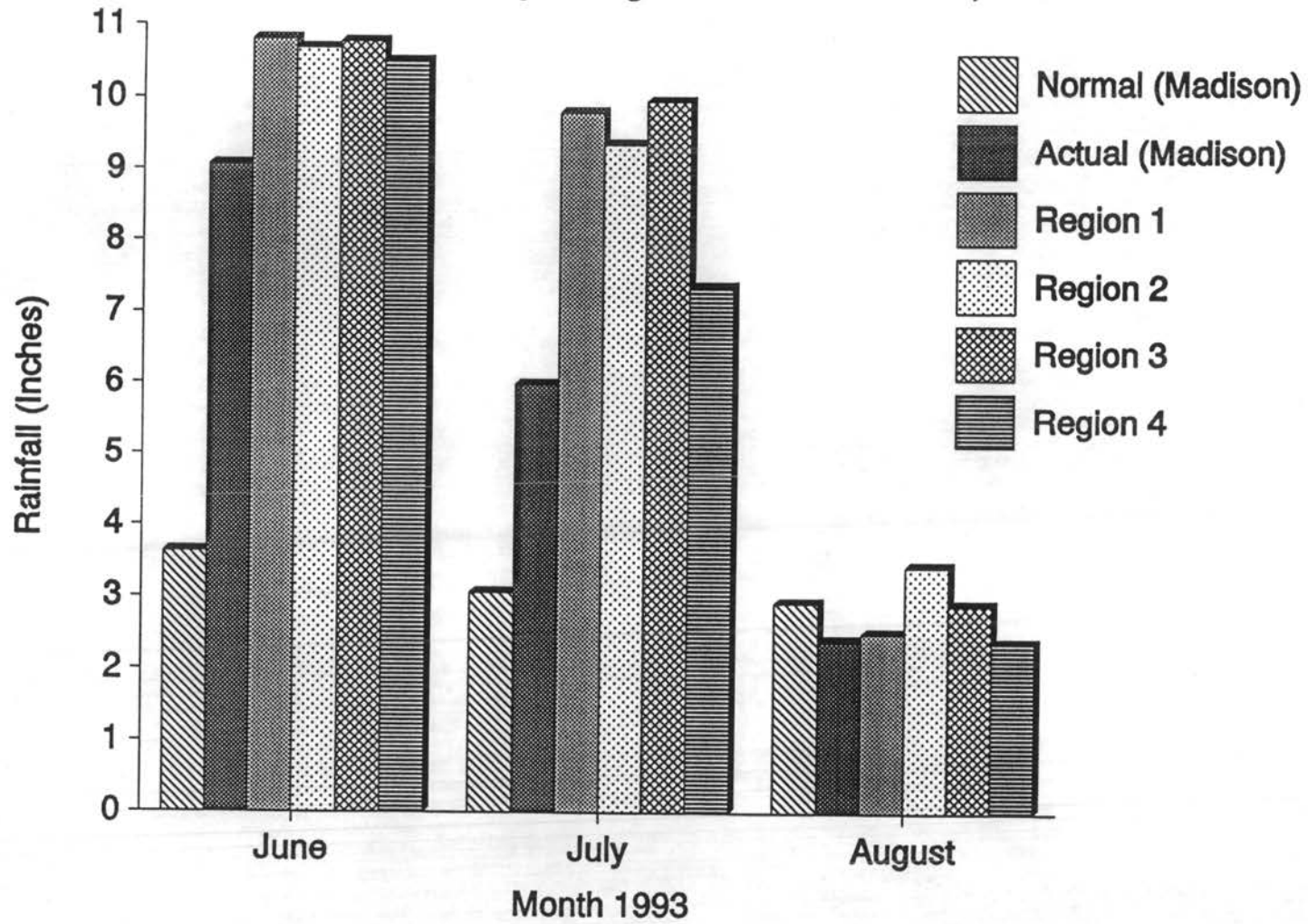


Fig. 17. Soil Moisture.
System Comparison

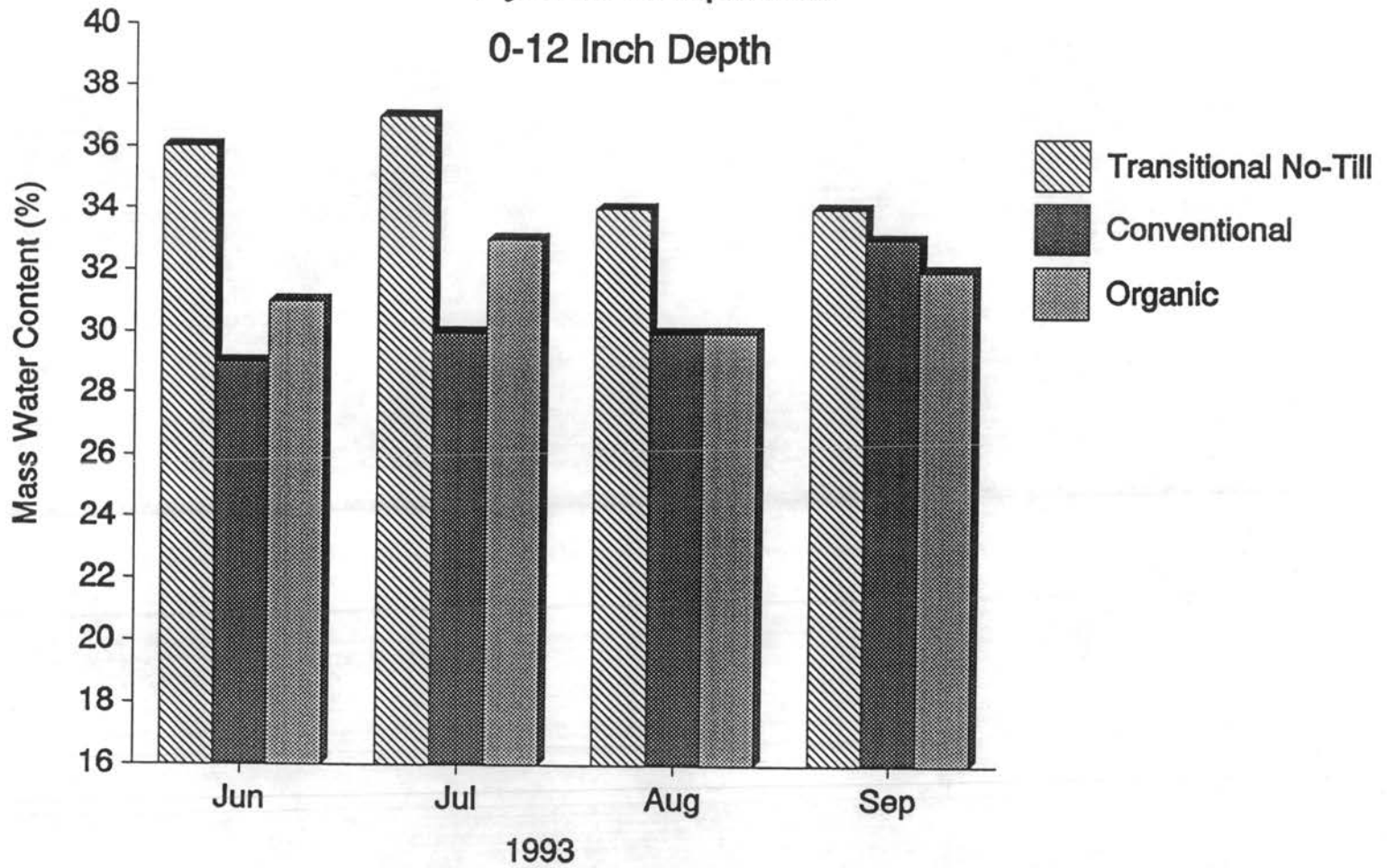


Fig. 18. Soil Moisture.
System Comparison
12-24 Inch Depth

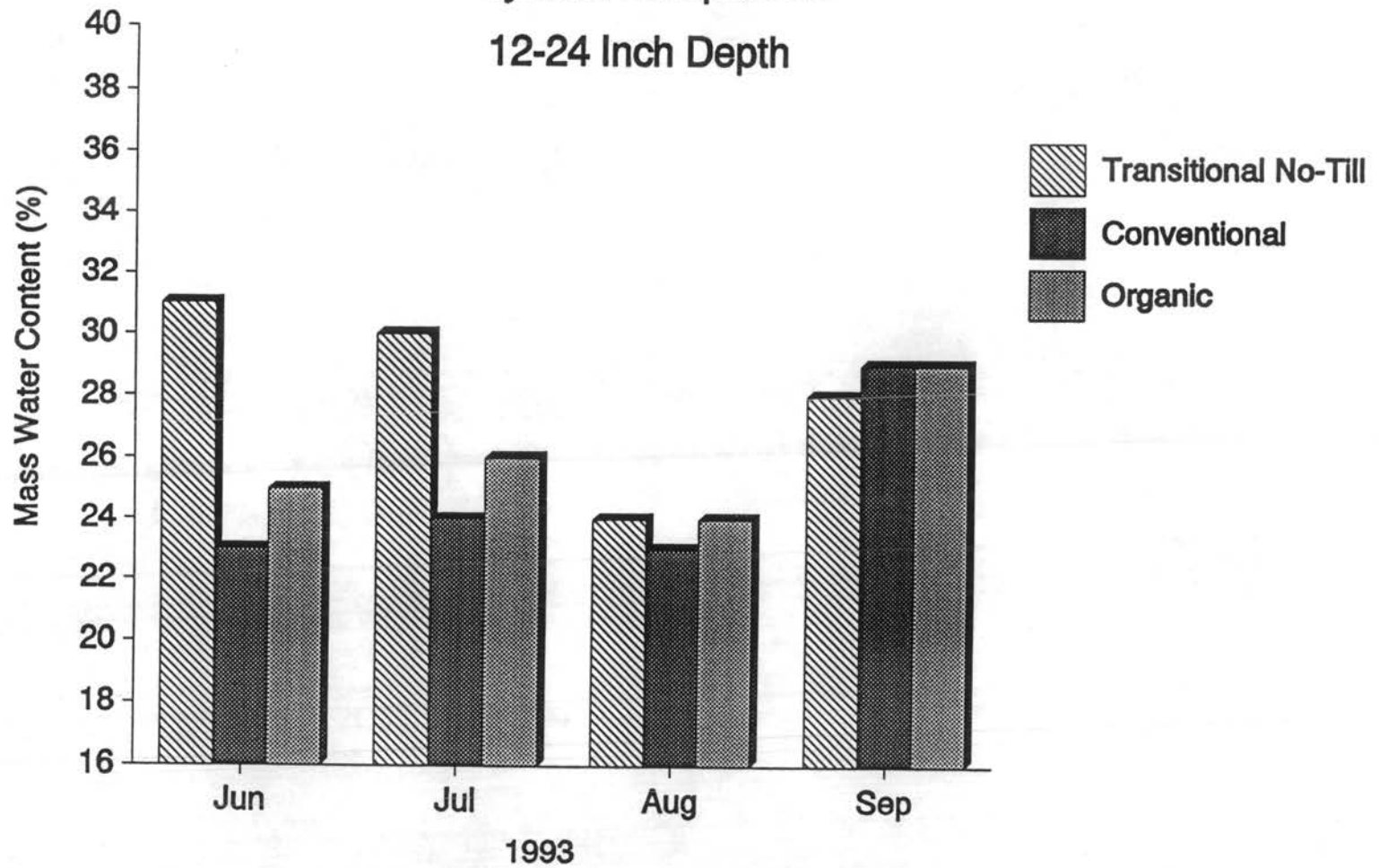


Fig. 19. Soil Moisture.
System Comparison
24-36 Inch Depth

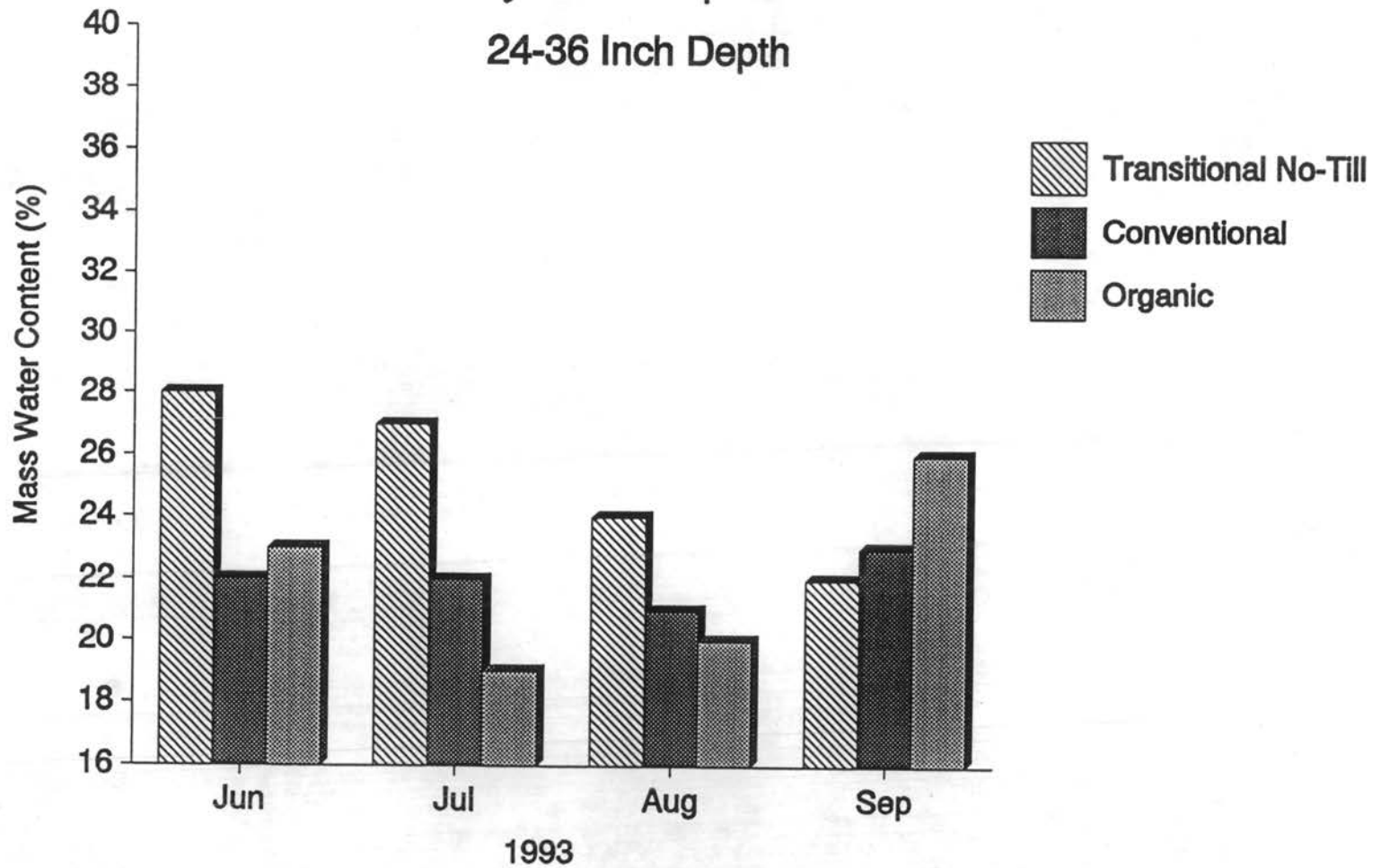


Fig. 20. Soil Moisture.
System Comparison

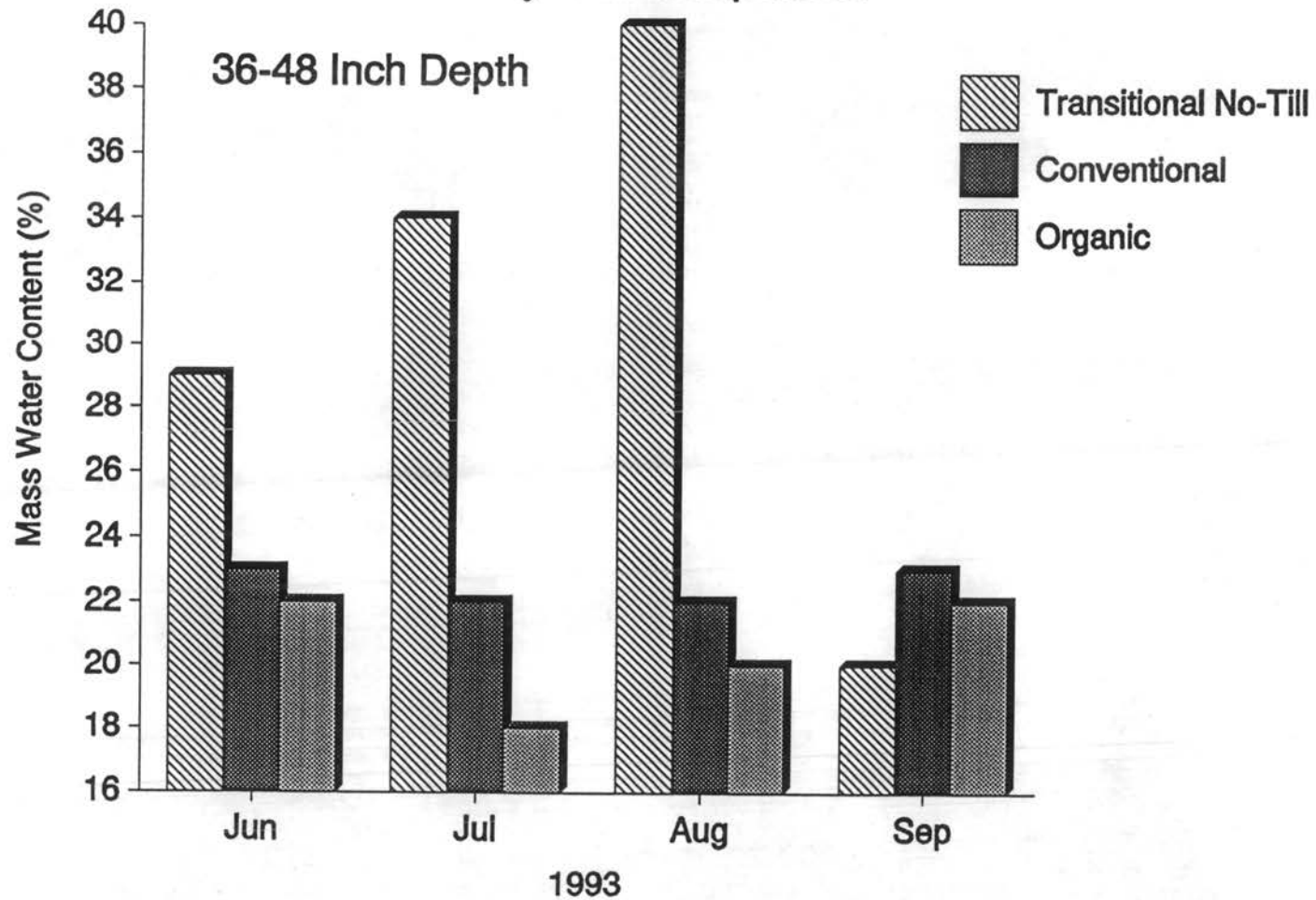


Fig. 21. Average Water Table Level.

Farming System Comparison

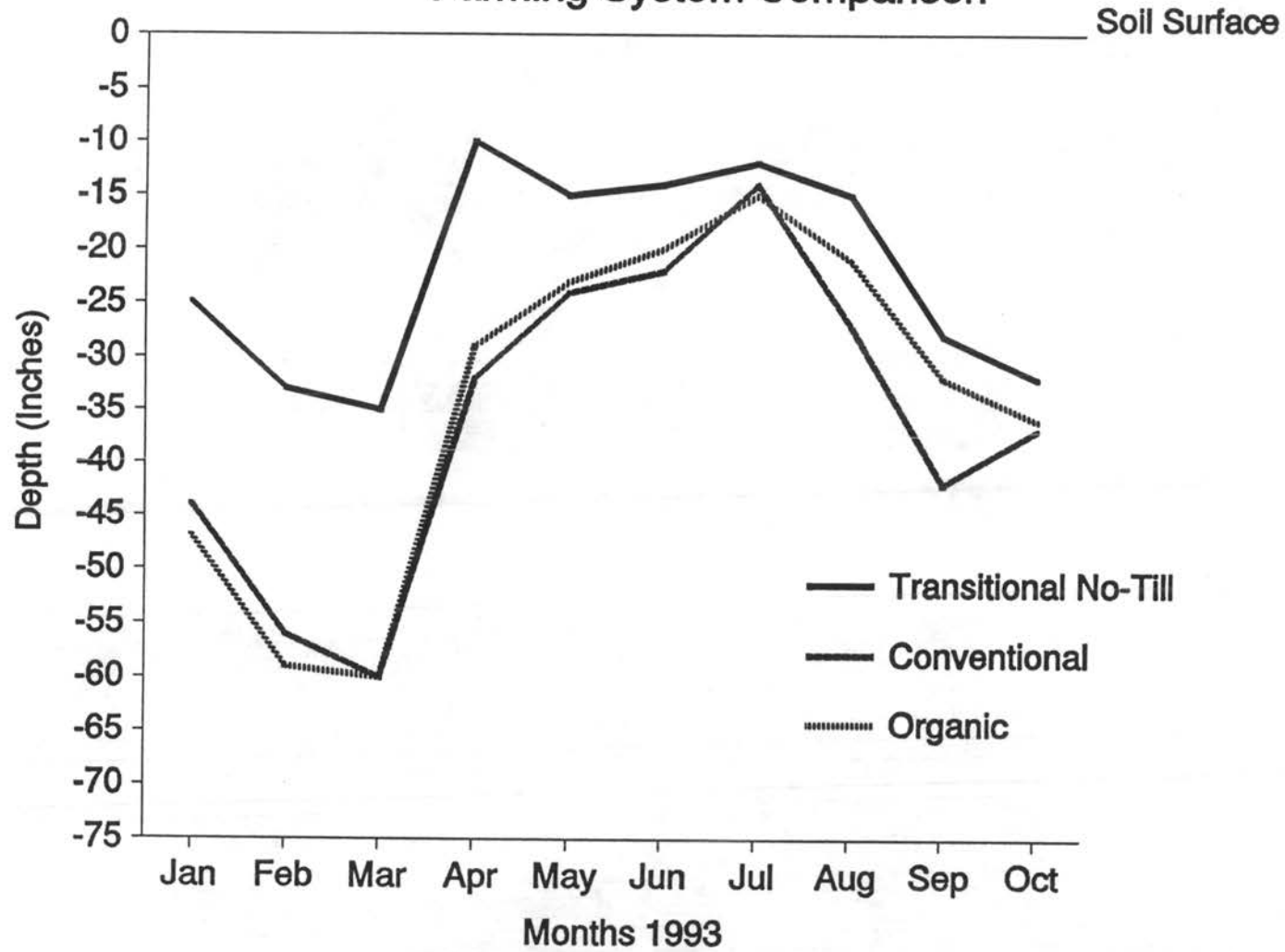


Fig. 22. Depth to Calcium Carbonate.

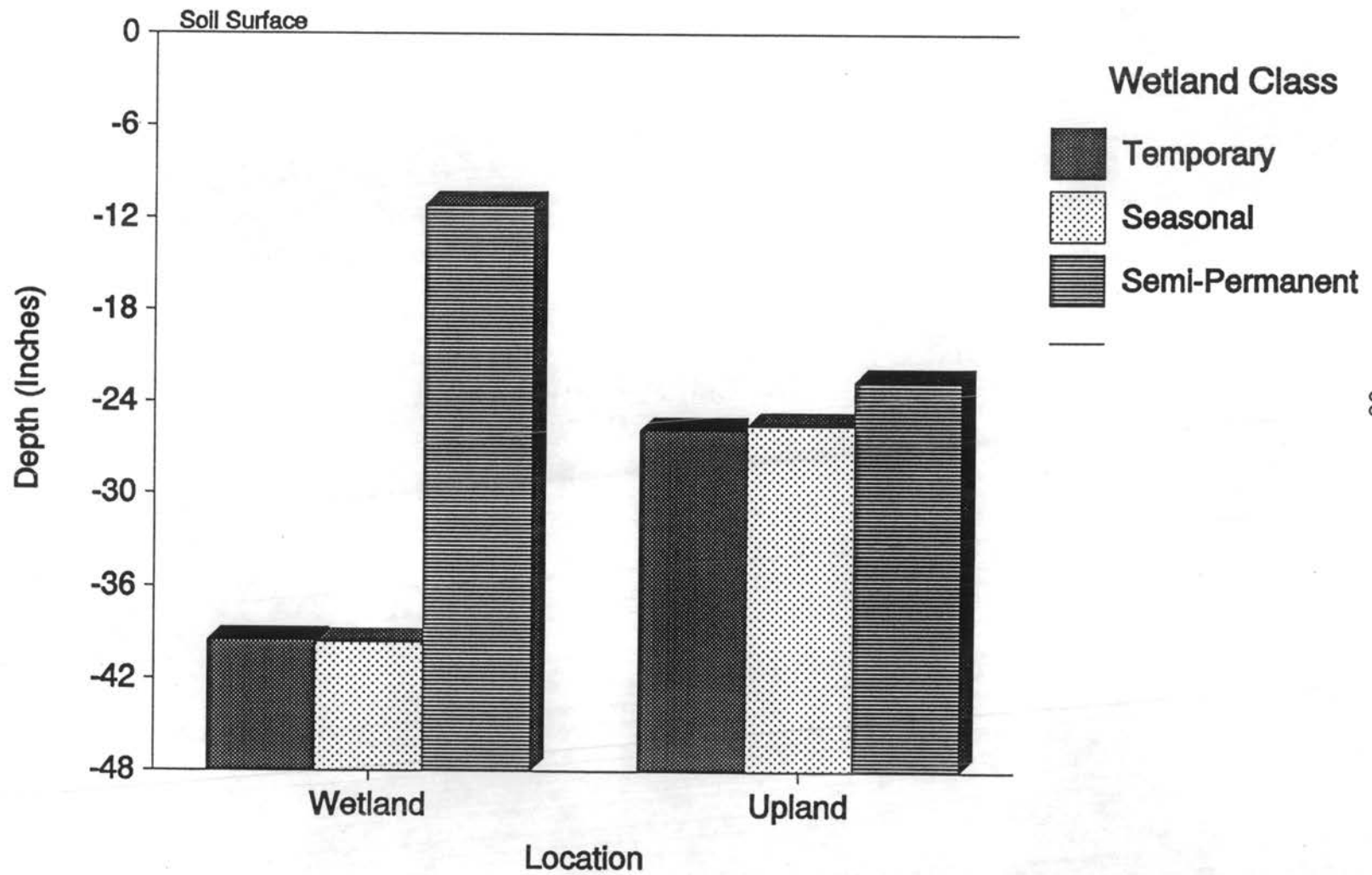


Fig. 23. Chemical Analysis of Wetland Surface Water.
1993

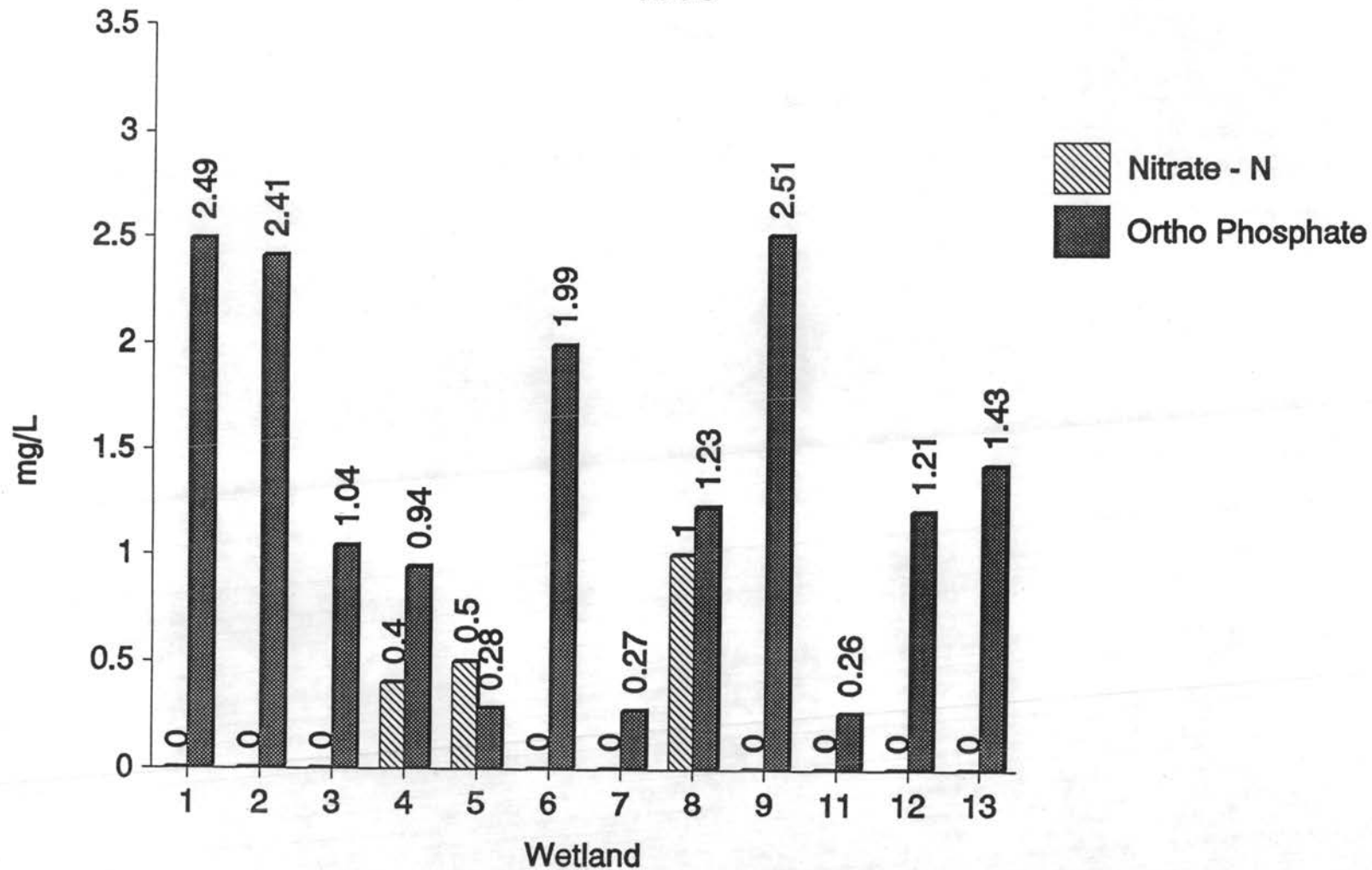


Fig. 24. Chemical Analysis of Wetland Ground Water.
1993

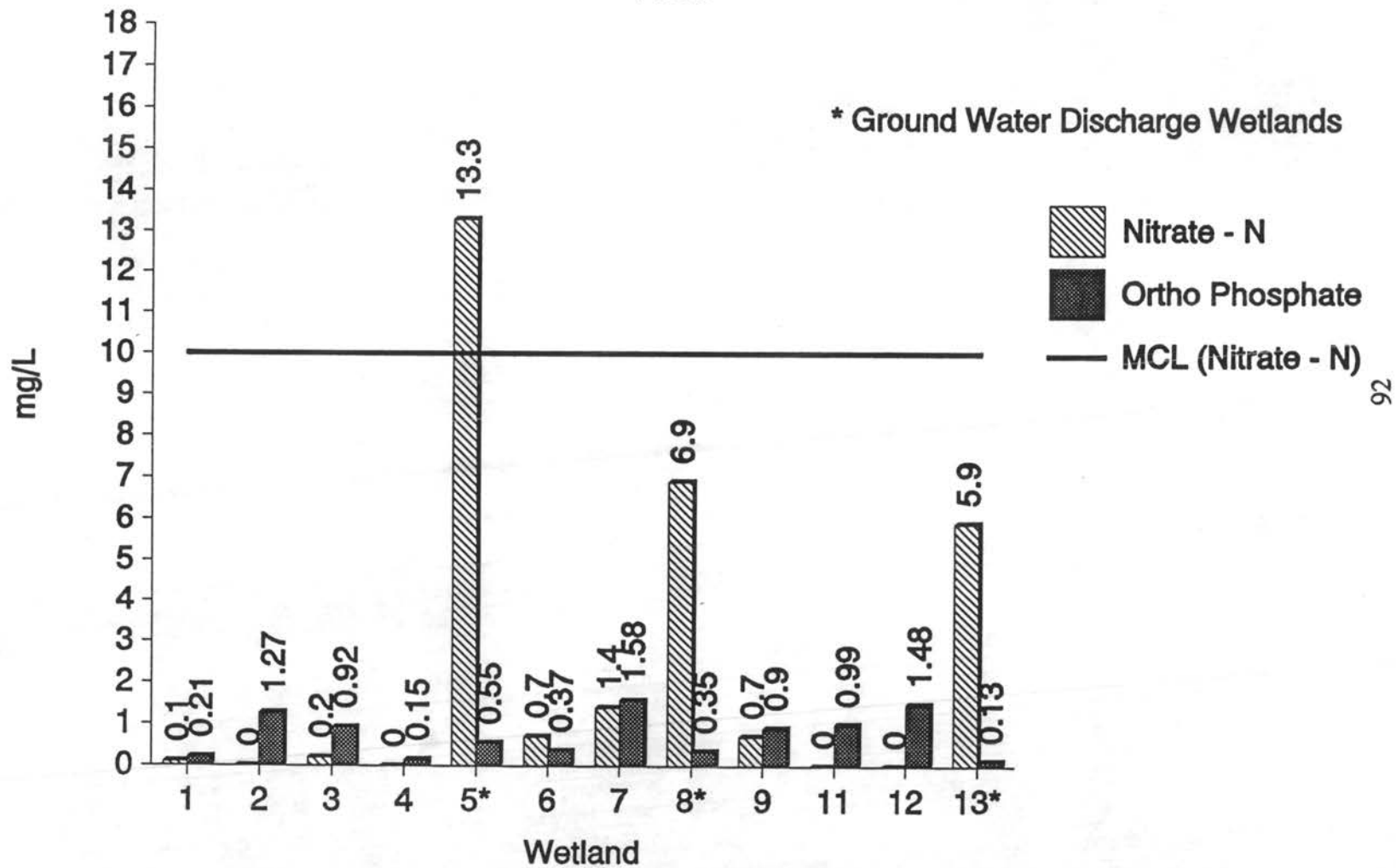


Fig. 25. Chemical Analysis of Upland Ground Water.
1993

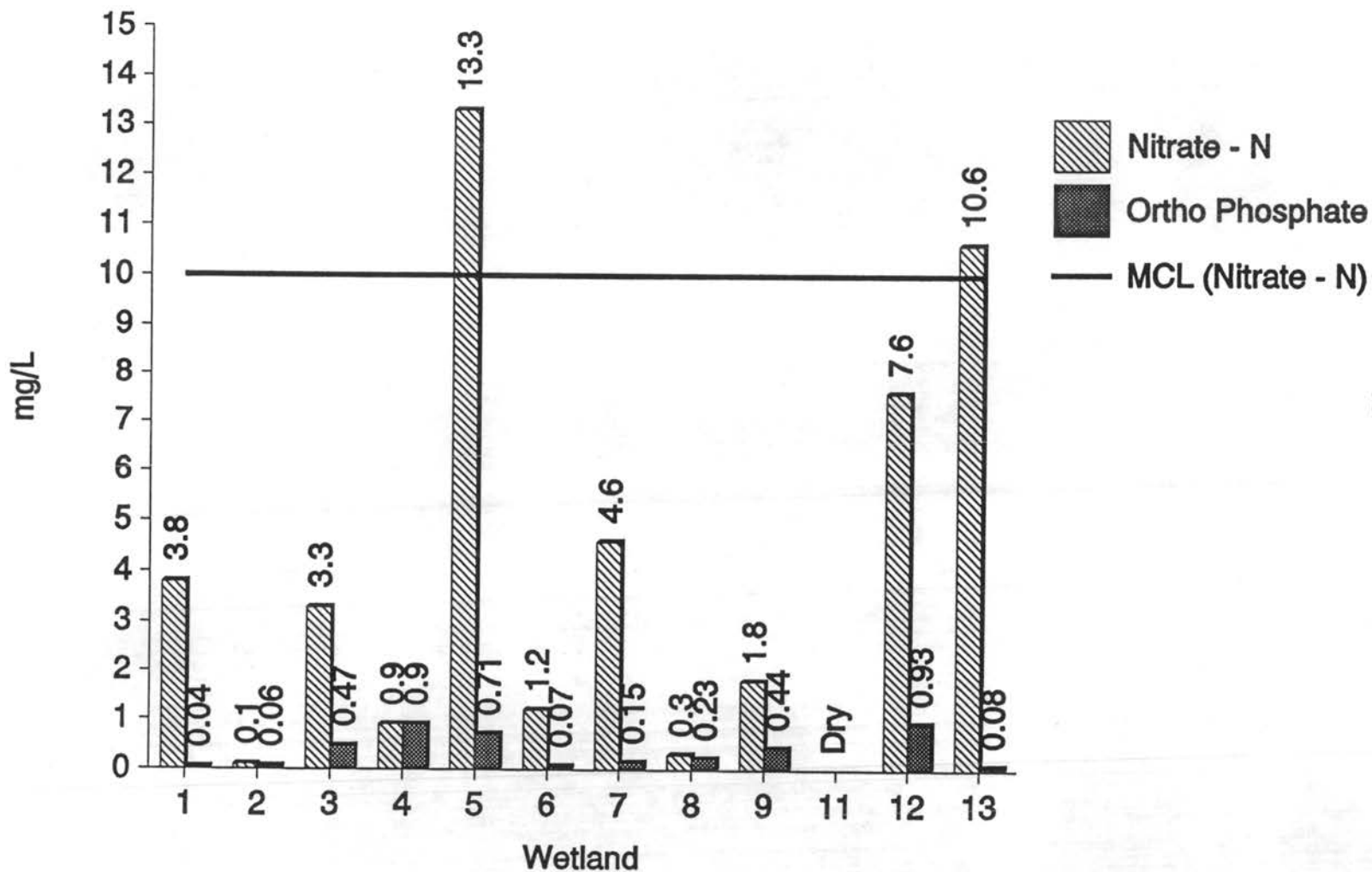


Figure 26 National Wetlands Inventory (NWI) by Management System
Lake and Minnehaha Counties

Transitional No-till (TNT) and Organic (ORG) Wetland Inventory, Lake County

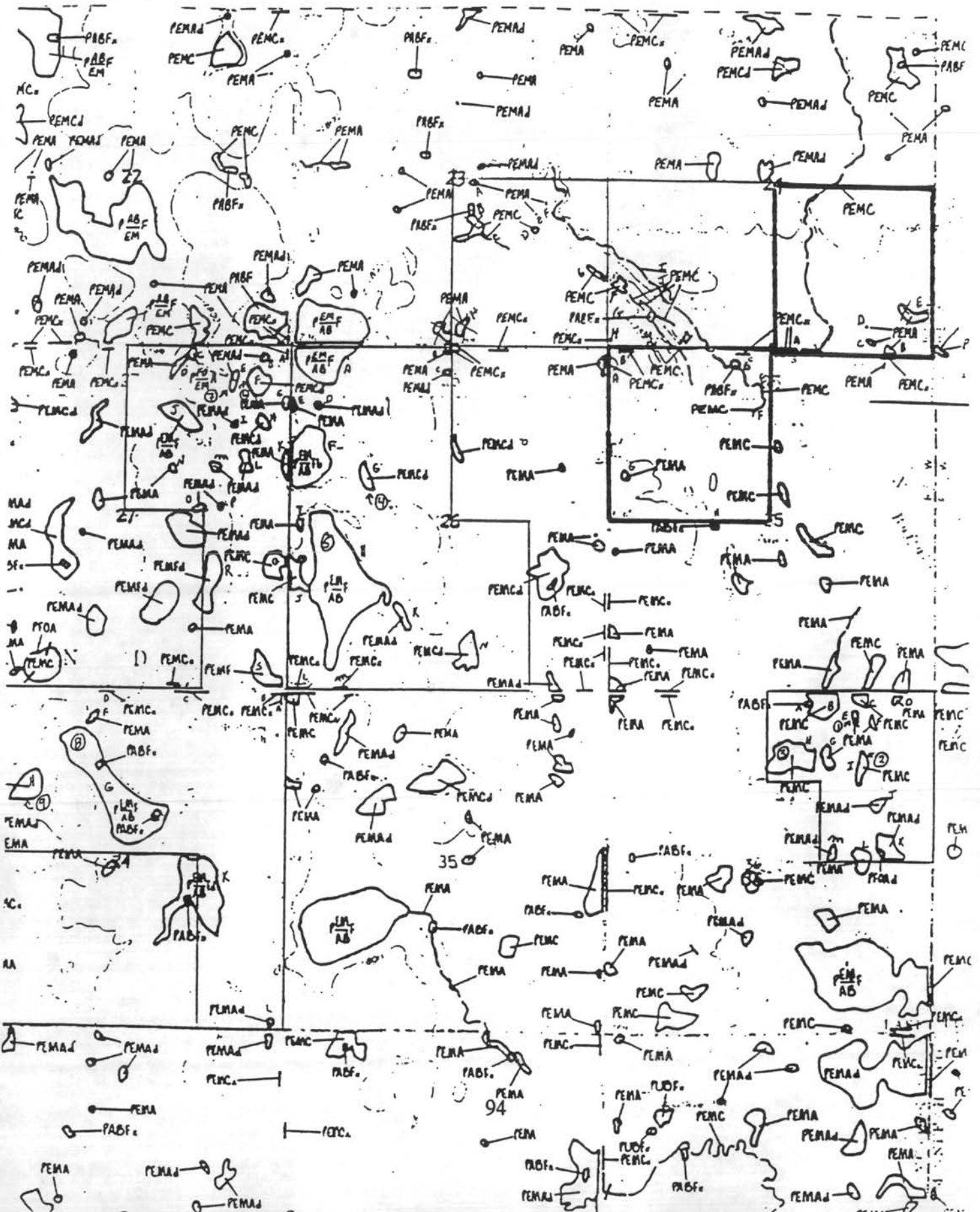


Figure 26 - Continued

Conventional (CON) Wetlands Inventory, Minnehaha County

