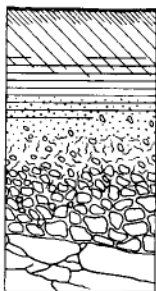P. ZANTE

MISE EN VALEUR DES MANGROVES DU SENEGAL Vallée des Kalounayes Site d'étude de Koubalan

COMPORTEMENT HYDRIQUE DES SOLS DE LA SEQUENCE AU COURS DE LA SAISON 1984-1985

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COMPORTEMENT HYDRIQUE DES SOLS DE LA SEQUENCE AU COURS
DE LA SAISON 1984-1985.

P. ZANTE

Novembre 1987

O . R . S . T . O . M

INSTITUT FRANCAIS DE RECHERCHE SCIENTIFIQUE
POUR LE DEVELOPPEMENT EN COOPERATION
centre de DAKAR-HANN

SOMMAIRE

- R E M A R Q U E -

Ce rapport est un prémier dépouillement des relevés de sonde à neutrons. Nous l'avons réalisé pour que les principales données soient accessibles et puissent être éventuellement reprises ultérieurement.
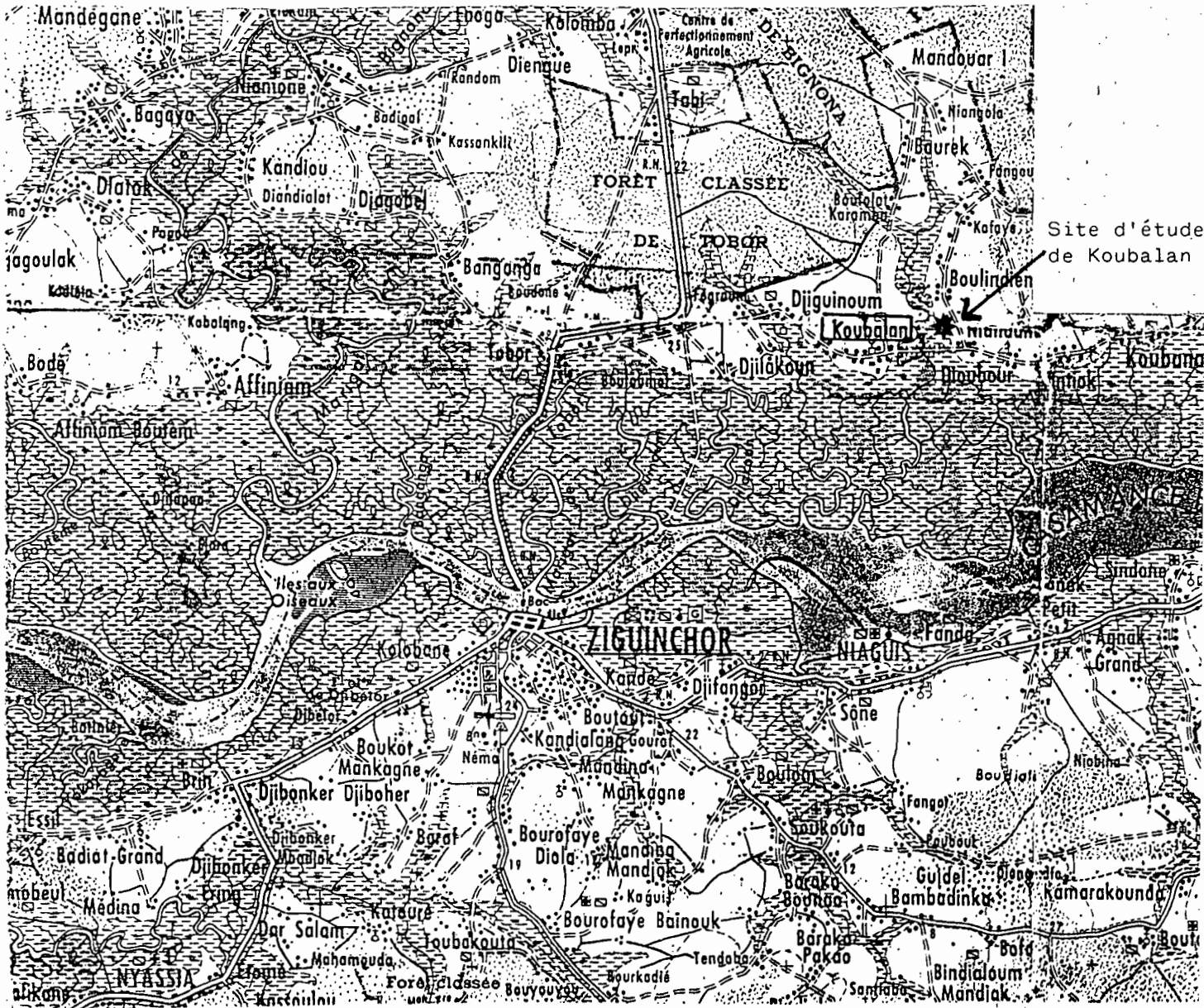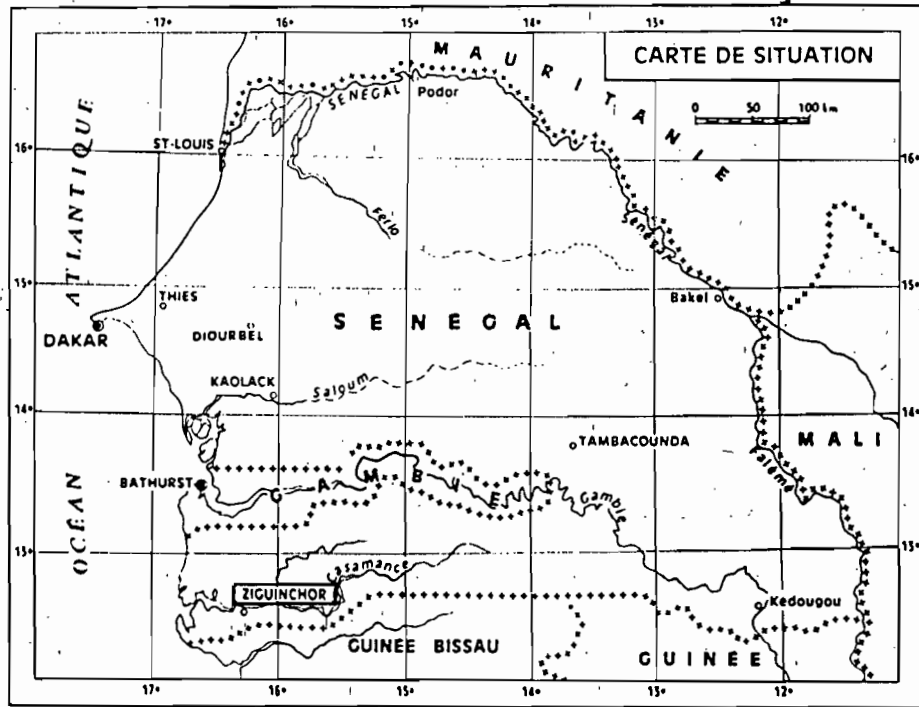
Fig. 1: Extrait de la carte IGN au 1/200 000 Ziguinchor

INTRODUCTION:

Le marigot de Koubalan se situe sur la rive droite de la casamance dans laquelle il se déverse, en amont de Ziguinchor. Sa vallée pénétre dans la forêt des Kalounayes, au sud de Bignona.

L'implantation des différents sites d'étude a été choisie à la suite d'une cartographie pédologique au 1/10.000 (P.BOIVIN, J.Y. LE BRUSQ -1984-) qui avait pour but de définir l'état actuel de la vallée, notamment en regard du développement de la riziculture.

Un suivi de quatre parcelles expérimentales a été décidé, sur une séquence représentant les principaux types de sols allant du plateau vers le tanne (Fig.1):

-Station 1: sous la palmeraie, en bordure de plateau
-Station 2: à la limite palmeraie/terrasse
-Station 3: à la partie inférieure de la terrasse
-Station 4: au milieu du tanne vif

Le suivi des variations d'humidité au cours de la saison des pluies a été effectué journellement à l'aide d'une sonde à neutrons SOLO 20 sur chacun des sites. Le site n°4, à l'aval de la séquence est situé en sol sulfaté acide; son étalonnage pose des problèmes non résolus dûs à la teneur élevée en chlorures. De plus ce sol reste innondé pendant tout l'hivernage et saturé en saison sèche à partir de 60cm. Il ne sera pas traité ici.

La saison des pluies 1984 a débuté le 2 juin pour se terminer le 6 octobre avec une répartition équitable des pluies entre les mois de juin, juillet, août et septembre. Le total précipité est de 942,7mm. Trois épisodes pluvieux importants ont contribués à ce total: du 23 au 28 juin: 112,0mm, du 30 juillet au 2 août: 147,3mm et 71,8mm le 12 août.

1 : Etalonnage de la sonde SOLO 20.

L'étalonnage a été effectué par prélèvements in-situ en fin de saison sèche, en cours d'hivernage et en fin d'hivernage.
Les densités apparentes ont été déterminées par la méthode du cylindre à raison de trois mesures par horizon. Les résultats sont les suivants:

Site P1:		Site P2:		Site P3:	
0-10	: 1,56	0-40	: 1,46	0-20	: 1,45
10-60	: 1,26	40-110	: 1,71	20-40	: 1,28
60-140	: 1,42	110-190	: 1,78	40-80	: 1,45
140-290	: 1,72			80-225	: 1,71

Les droites d'étalonnage établies ont les équations suivantes, où:
- Hv est l'humidité volumique en pourcent.
- TNAJ est le Taux de Neutrons Ajusté, c'est à dire ramené à un comptage standard de 1000 dans l'eau.

Fig: **1** KOUBALAN — PROFIL TOPOGRAPHIQUE DE LA SÉQUENCE
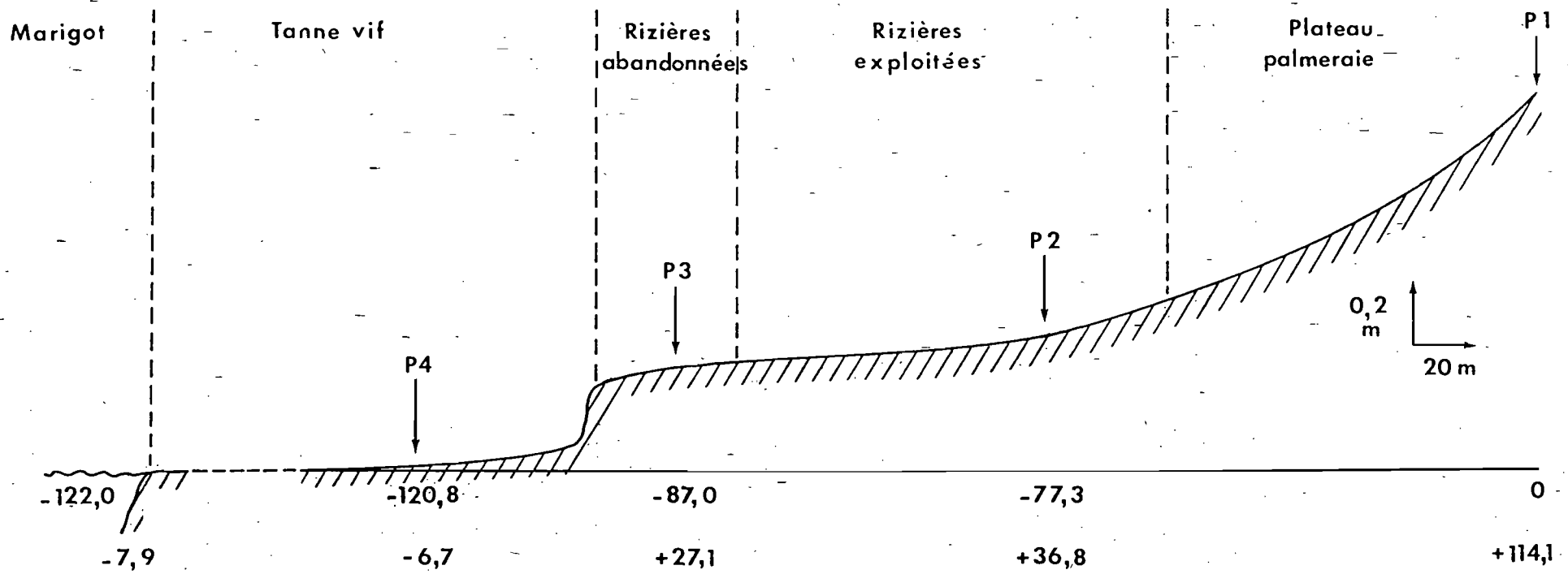
P1

0-20   : Hv = 0,07676 TNAJ- 4,7042   r= 0,9988

20-60   : Hv = 0,09461 TNAJ - 13,810   r= 0,9777

60-140 : Hv = 0,0777 TNAJ - 13,358   r = 0,9843

140-290 : H_v = 0,0589 TNAJ - 4,1774   r = 0,9442

P2

0-40   : H_v = 0,06372 TNAJ - 0,5412   r = 0,9401

40-110 : Hv = 0,09662 TNAJ - 18,79   r = 0,9702

110-190 : H_v = 0,1135 TNAJ - 30,04   r = 0,9331

P3

0-20   : Hv = 0,0956 TNAJ - 4,9384   r = 0,9582

20-40   : Hv = 0,1067 TNAJ - 17,6283   r = 0,9569

40-80   : Hv = 0,0979 TNAJ -36,82   r = 0,9684

80-225 : Hv = 0,1377 TNAJ - 36,882   r = 0,9600

Nous avons également calculé l'intervalle de confiance pour une valeur individuelle estimée à l'aide d'une droite de régression de la forme y=ax+b (d'après Théorie et méthodes statistiques vol.2 p.291 P.Dagnelie).

La variance résiduelle de y est donnée par:

$$s^2(e) = \frac{1 - r^2}{n - 2} \left[\varepsilon y_i^2 - \frac{(\varepsilon y_i)^2}{n} \right]$$

L'intervalle de confiance dans le cas de l'estimation d'une valeur individuelle, tenant compte de la variance propre de cette valeur individuelle sont calculées par:

$$y_c = a x + b \pm t_{1 - \alpha/2} \sqrt{s^2(e) \left[1 + \frac{1}{n} + \frac{(x - \frac{\varepsilon x_i}{n})^2}{SCEx} \right]}$$
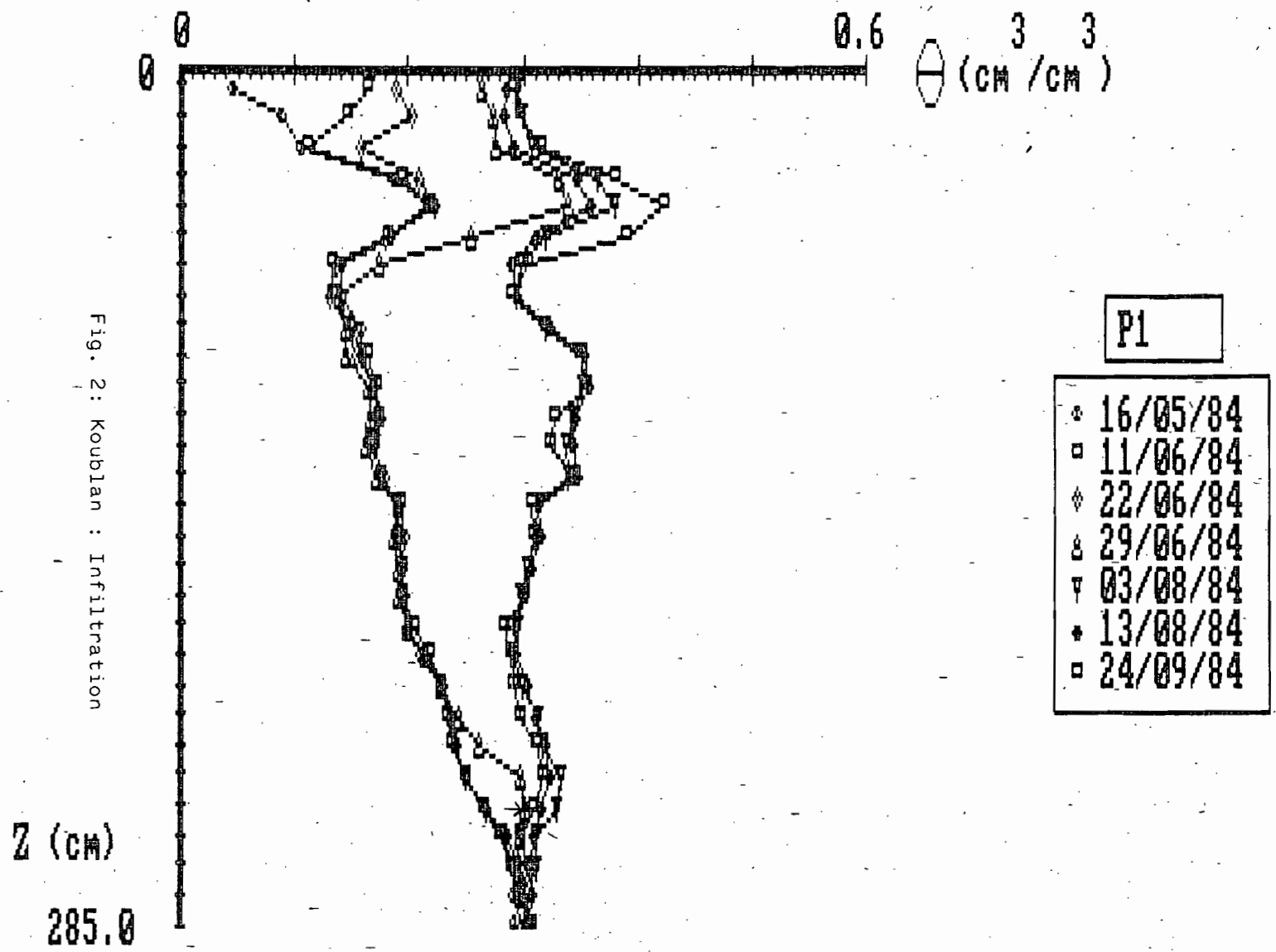
Fig. 2: Koublan : Infiltration
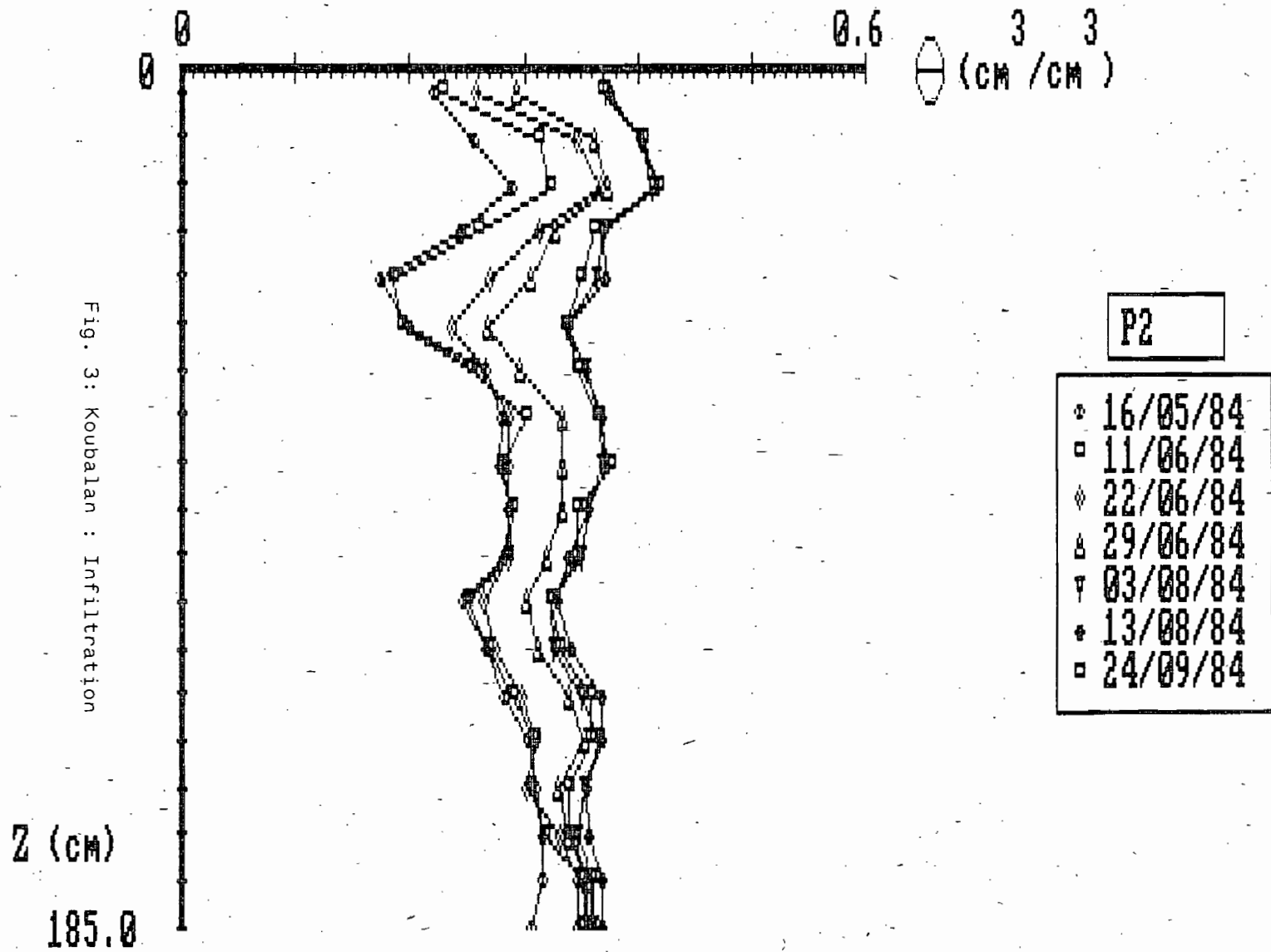
P1

⊕	16/05/84
▫	11/06/84
⊕	22/06/84
⚇	29/06/84
⊽	03/08/84
✴	13/08/84
▫	24/09/84

Θ (cm³/cm³)

Z (cm)

285.0

Fig. 3: Koubalan : Infiltration

P2

- ⊕ 16/05/84
- □ 11/06/84
- ◇ 22/06/84
- △ 29/06/84
- ▽ 03/08/84
- ✦ 13/08/84
- ▫ 24/09/84

0   0.6   ⊖ (cm³/cm³)

Z (cm)

185.0

Fig. 4: Koubalan : Infiltration

P3

- ✦ 16/05/84
- ↘ 11/06/84
- ◈ 22/06/84
- ⚥ 29/06/84
- ⚥ 03/08/84
- ✦ 13/08/84
- ▫ 24/09/84

$\ominus$ (cm^3/cm^3)

Z (cm)

225.0

0 ... 0.6

Fig. 5 : Koubalan : Infiltration

P1

- 16/05/84
- 11/06/84
- 22/06/84
- 29/06/84
- 16/07/84
- 24/07/84
- 29/07/84
- 03/08/84

Maxi: 24/9

3/8

24/7

16/7

29/6
22/6

Z (cm)

11/6

285.0

0

0.6

$\ominus$ (cm^3/cm^3)

- 8 -
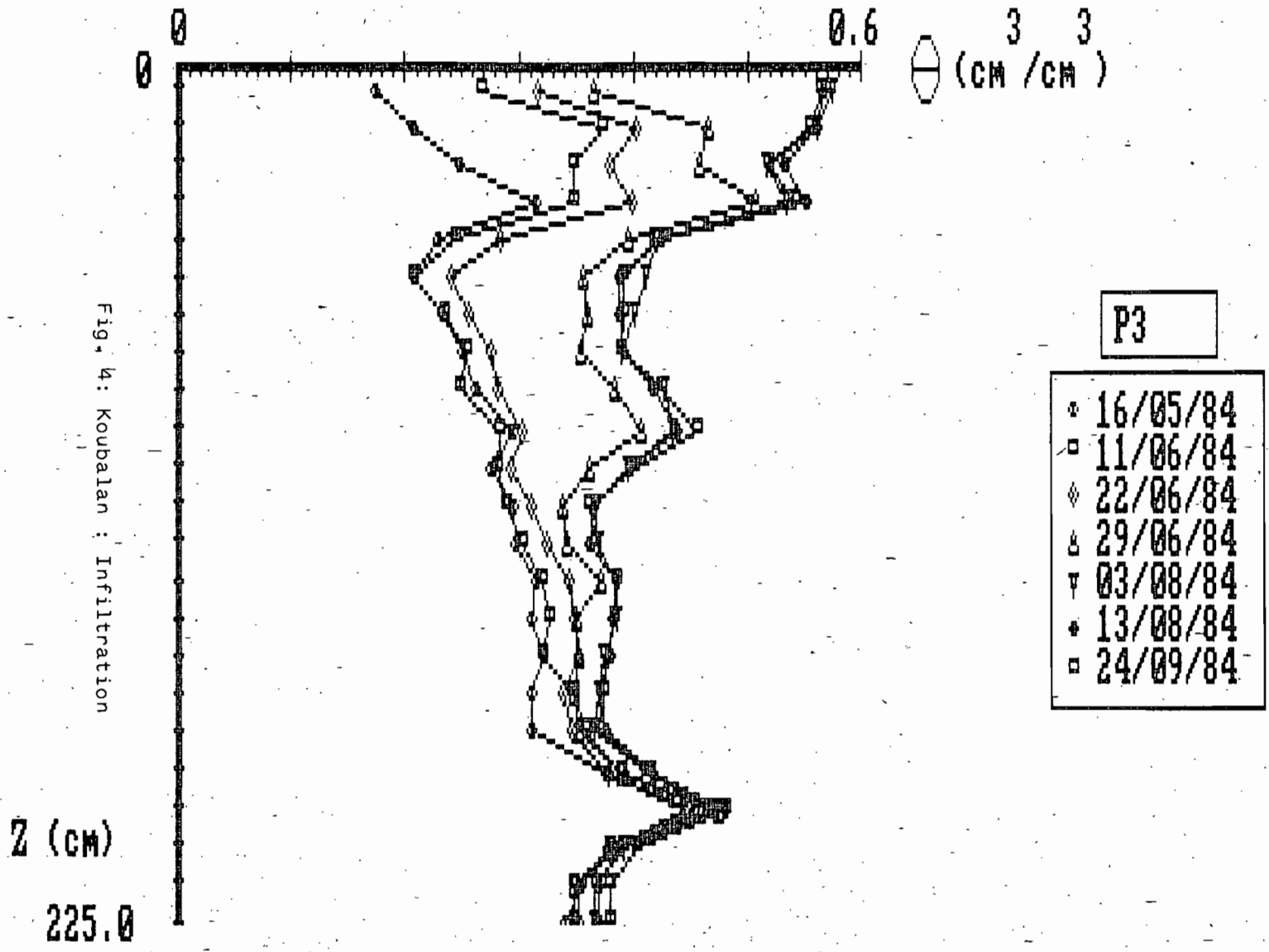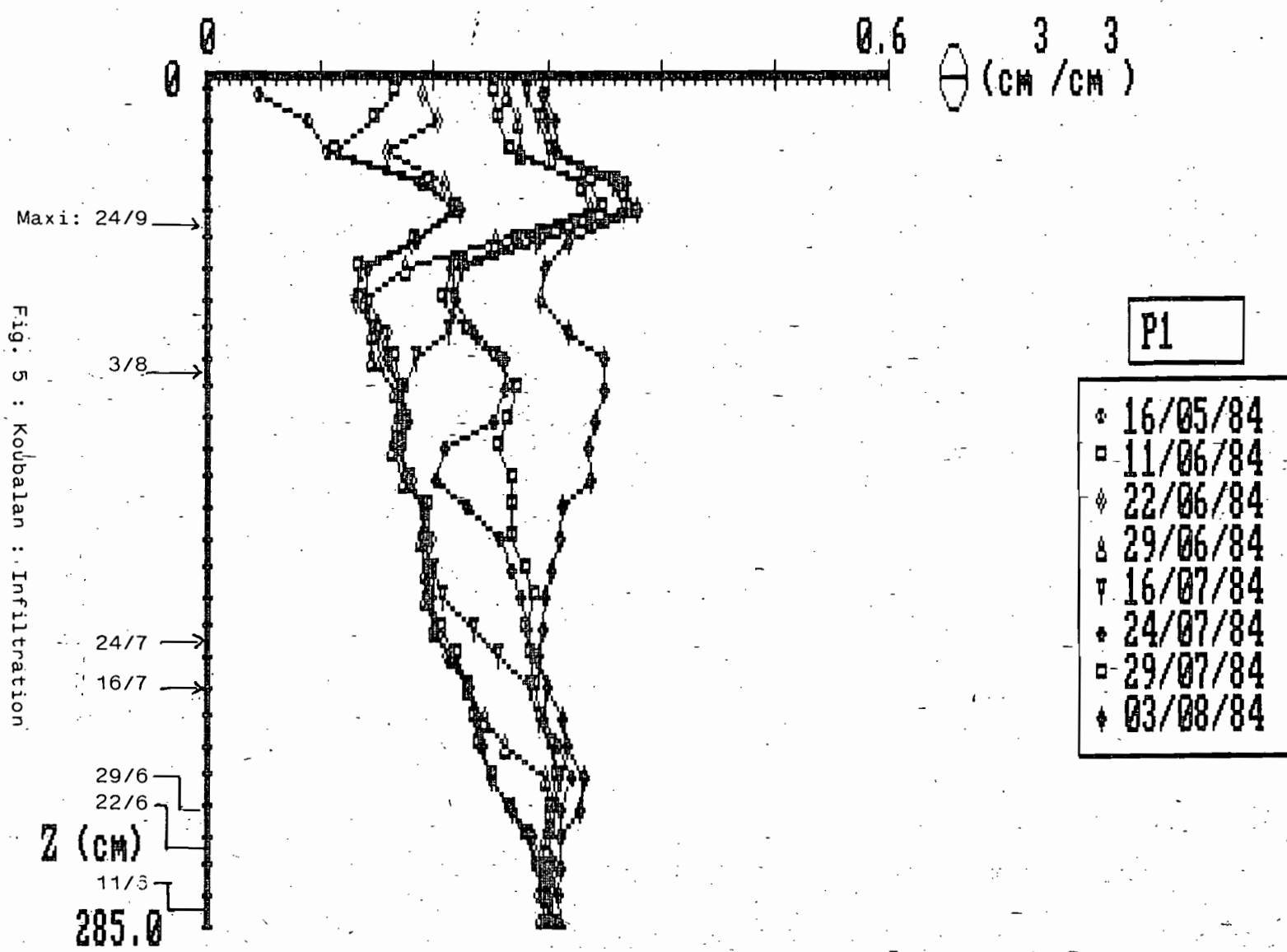
Avec : $SCE_x = \varepsilon xi^2 - \dfrac{(\varepsilon xi)^2}{n}$

n: nombre de couples (xi;yi)
r: coefficient de corrélation
t1-α/2: variable de la table de Student
pour α donné, avec n-2 degrés de liberté.

Les limites ainsi calculées pour différentes valeurs de x sont figurées sur les graphiques n°   à   .Elles ont été déterminées à P=0,90.

2 Infiltration

L'examen des courbes d'infiltration (Fig. 1, 2, 3) montre l'importance de la pluie du 23 au 28 juin. Elle provoque l'humectation des profils P3 jusqu'à 145cm et P2 jusqu'à 165cm; par contre en P1 elle n'affecte que les 75 premiers centimètres de sol, mais on constate un accroissement d'humidité au bas du profil, à partir de 215cm.

Tab.1 : Variation de stock correspondant à l'épisode pluvieux du 22 au 29 juin 1984 (112,0mm)

Site	S22/6	S29/6	ΔS
P1 0-75	137,1	198,1	+61,0
P2 0-165	482,8	535,7	+52,9
P3 0-145	460,4	566,1	+105,7

Seul le site P3 a absorbé la totalité de la pluie, P1 et P2 présentent un déficit de stock de 51 et 59,1mm.
La séquence pluvieuse du 30 juillet au 3 août amène les profils à leur teneur en eau maximum et ce jusqu'au 24 septembre, cette période comprenant des phases de ressuyage-infiltration plus ou moins prononcées en fonction de l'espacement des épisodes pluvieux et de la hauteur d'eau précipitée.

L'accroissement d'humidité constaté au bas du profil P1 après les pluies du 22 au 29 juin nous a amené à examiner plus en détail la période du 29 juin au 3 août. On constate alors qu'en P2 etP3, les profils hydriques se sont humectés sur toute la profondeur dès la pluie du 23 au 29 juin, en même temps que la nappe phréatique remontait.

Par contre en P1, le phénomène de remplissage du profil par apport par le haut et par remontée de la nappe se poursuit. Ce n'est qu'à partir du 24 juillet que la zone intermédiaire restée sèche jusqu'alors disparaît.(Fig.5)
Ceci montre que jusqu'au 24 juillet la remontée du niveau de la nappe constaté en P1 ne peut pas se faire par apport d'eau de

Fig. 6 : KOUBALAN —   INVERSION DE CHARGE DE LA NAPPE EN DÉBUT D'HIVERNAGE 1984-1985

P mm

23/9
13/8 P2 = P1 598,1

4/8

2/8 P3 = P2 521,2

16/7
14/7
10/7 P4 = P3 259,3
30/6/84
20/6/84
3/6/84

Pld cm

20 cm
10 m   : Echelle

x — x : Surface du sol

— 10 —

Fig. 7: Koubalan Ressuyage

Fig. 8 : Koubalan : Ressuyage

P2

* 24/09/84
□ 01/10/84
✧ 02/11/84
△ 15/11/84
▽ 02/12/84
● 22/01/85
▫ 05/04/85
◆ 09/05/85

--- pF 4,2

——— pF 3,0

$\ominus$ (cm^3/cm^3)

Z (cm)

185.0
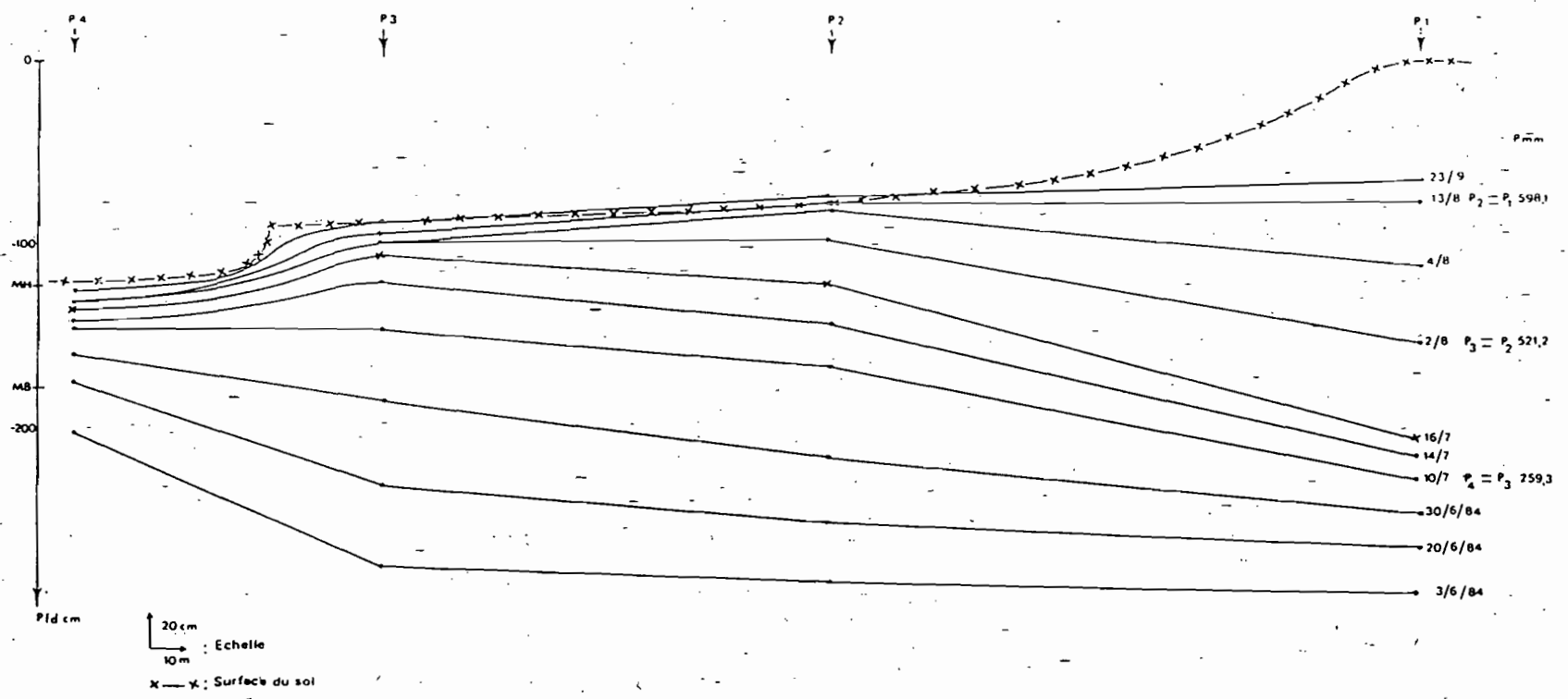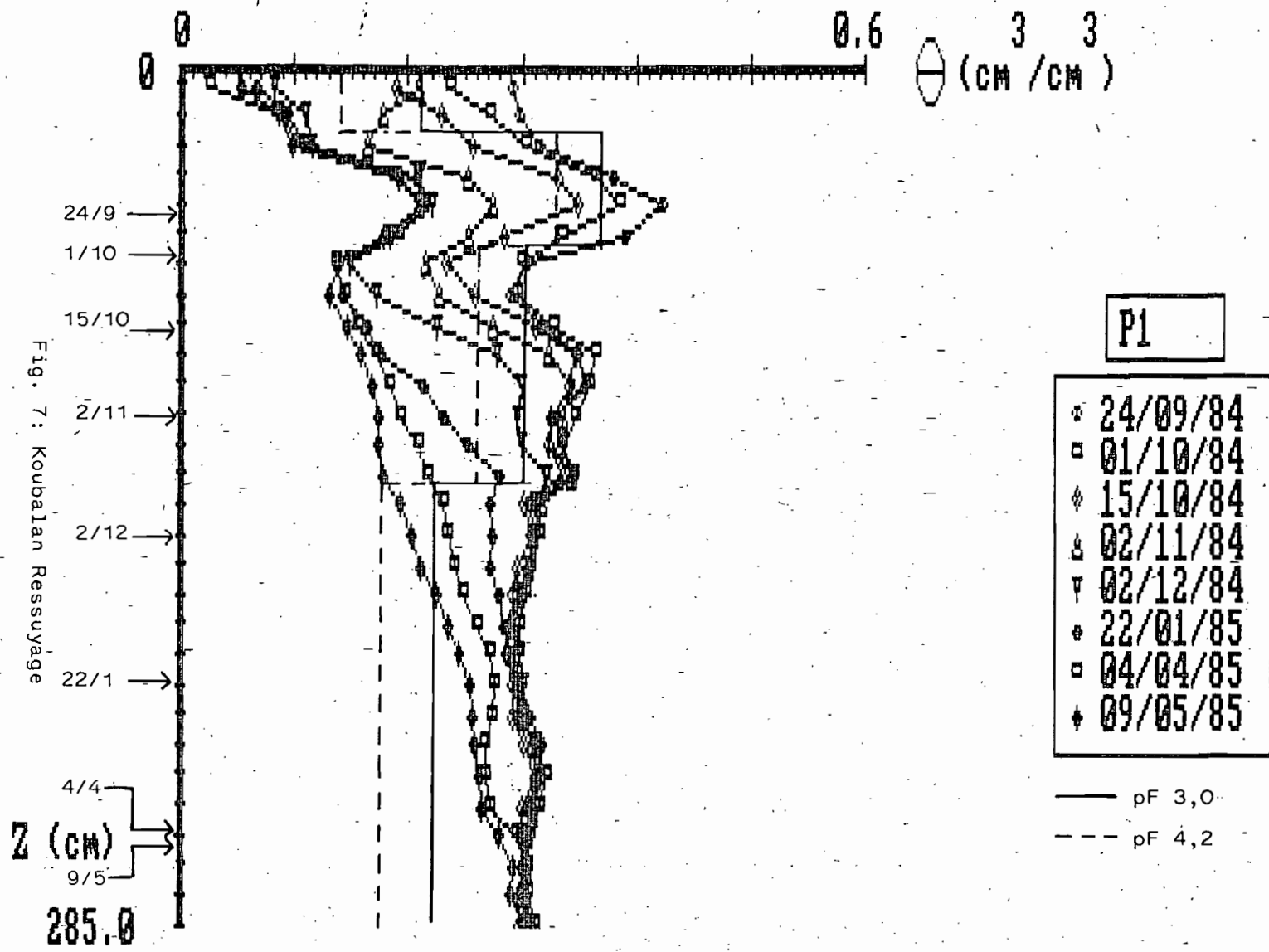
Fig. 9: Koubalan : Ressuyage
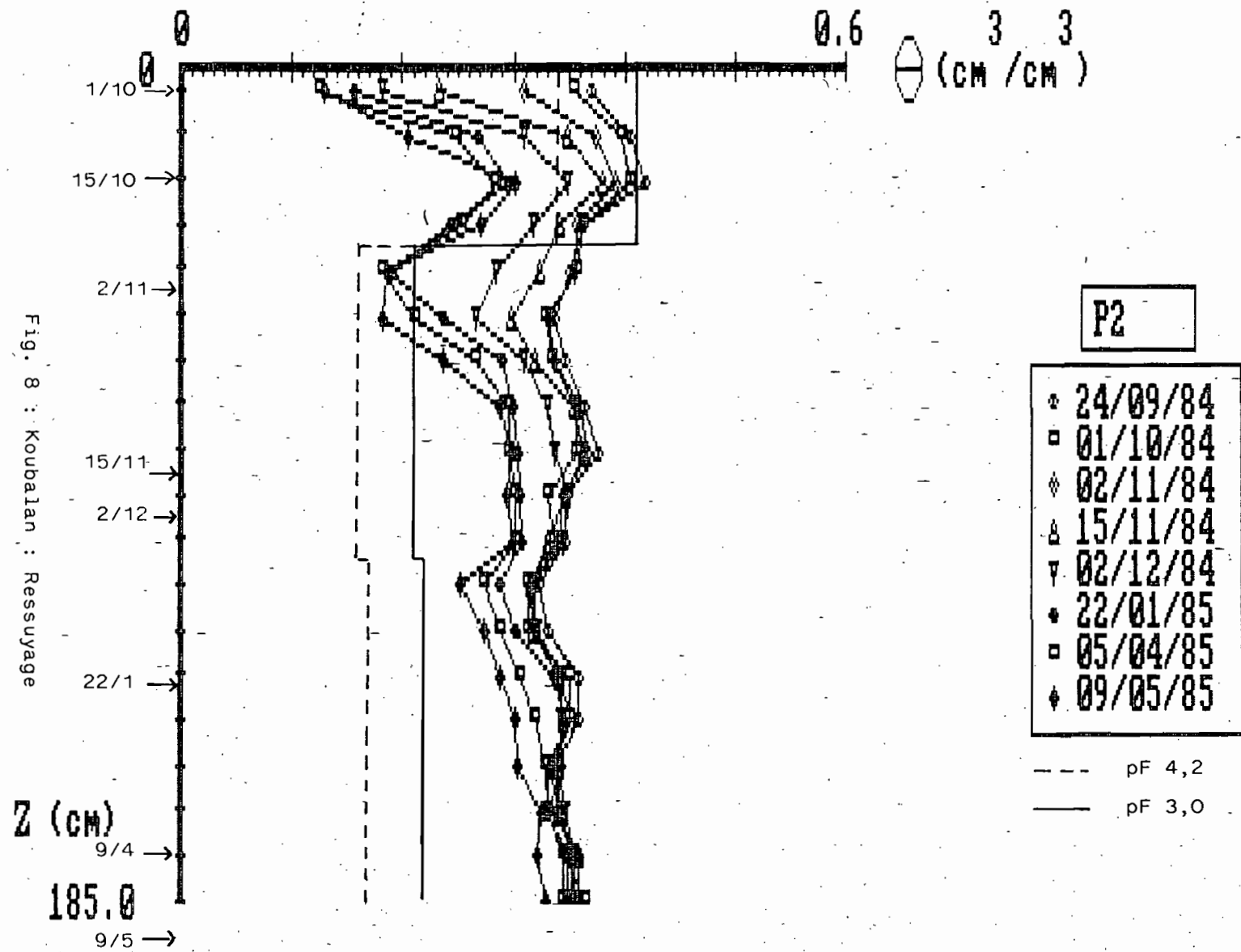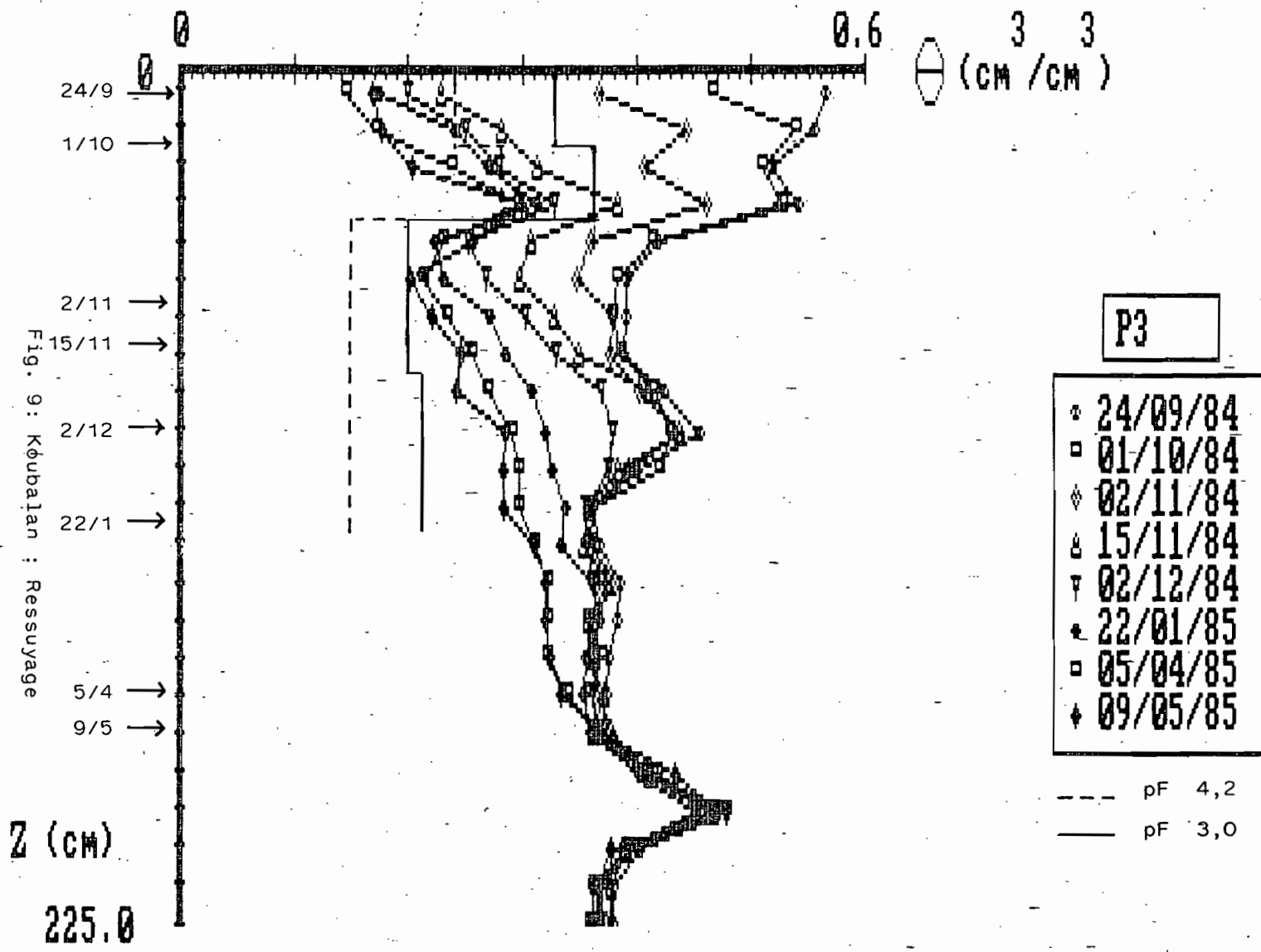
de la base du profil P1 par transferts latéraux.

L'origine de ces apports latéraux n'est pas clairement établie. En effet d'après les relevés piézométriques, l'écoulement de la nappe peut se faire de P2 vers P1 jusqu'au 13 août(Fig.6), mais cette hypothèse est difficilement compatible avec l'évolution de la salinité des nappes durant l'hivernage; les relevés effectués en P2 indiquent un dessalement de là nappe, la conductivité passant de 3,5mS/cm en juin à 0,25mS/cm en septembre; pendant ce temps, la nappe en P1 se dessale également, passant de 0,6 à 0,04mS/cm et reste toujours nettement moins salée que celle de P2, ce qui semble exclure un transfert de P2 vers P1. L'installation de piézomètres en amont de P1 et l'utilisation de traceurs permettrait peut-être de conclure quant au régime de fonctionnememt des nappes.

3 Phase de ressuyage

Les profils relevés du 24 septembre 84 à mai 85 (Fig.7,8,9) montrent une baisse progressive de l'humidité en fonction du temps avec deux interruptions traduites par les courbes d'évolution du stock d'eau (Fig.10,11, 12).
La première traduit les 23mm de pluie tombés début octobre,
la seconde plus importante a lieu début novembre.
Les relevés du 2 novembre indiquent une augmentation des stocks dans tous les profils.

L'examen des relevés piézométriques (Fig.13-14)montre une remontée de la nappe, plus importante en P4 qu'en P3 et P2, alors qu'en P1 la descente se stabilise.Les relevés pluviométriques n'indiquent pas de pluie à cette époque à Koubalan; cependant 4,2mm ont été enregistrés à Ziguinchor le 1 novembre.
Nous avons alors vérifié la possibilité de remontée des nappes par l'occurence de marées hautes à fort coefficient à cette époque de l'année. La figure n° 15 montre qu'au contraire autour du 1 novembre les marées hautes ont de faibles coefficients; par contre les marées basses ont, elles, de forts coefficients, passant progressivement de 0,2 à 0,8 à l'embouchure de la Casamance.

Ceci se traduirait par le maintien d'un niveau d'eau dans le marigot supérieur à celui de la période précédente, donc par une remontée du niveau des nappes sous l'influence du niveau d'eau dans le marigot.

Cette hypothèse pourrait être satisfaisante pour expliquer la remontée du niveau piézométrique, d'autant plus forte que l'on se rapproche du marigot. Cette remontée du niveau piézométrique est corroborée par une augmentation des stocks d'eau sur les trois sites entre le 30 octobre et le 2 novembre.
Cependant l'examen des profils hydriques montre qu'il y a eu également réhumectation du sol en haut des profils (Fig.16-17) ceci pourrait être expliqué en P3 par une remontée de la frange

Fig. 10 : Koubalan : Variations du stock d'eau

P2   □ 185.0 см

700
STOCK
мм

0
01/09/84   31/05/85
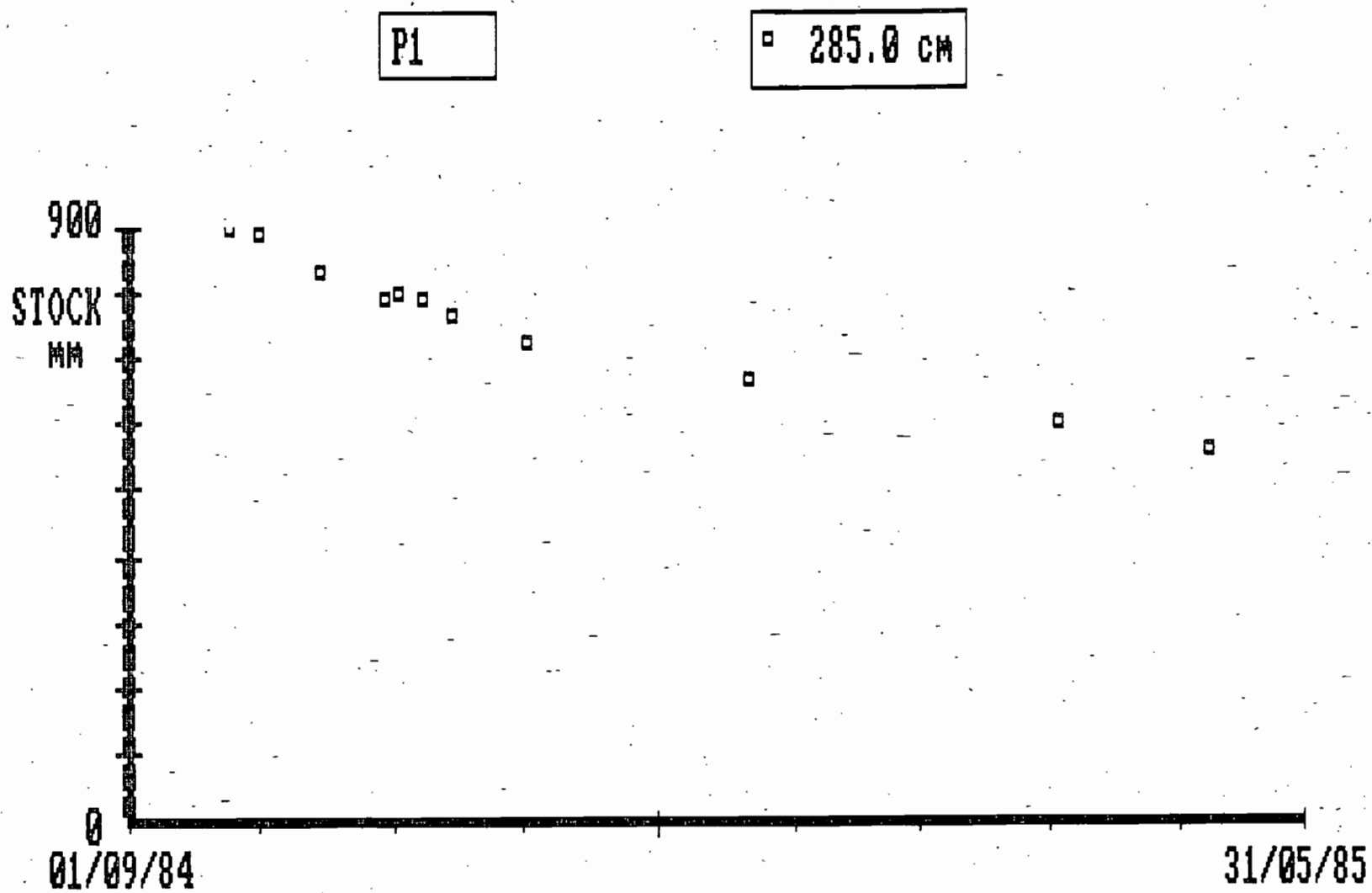
Fig. 11 : Koubalan: Variations du stock d'eau
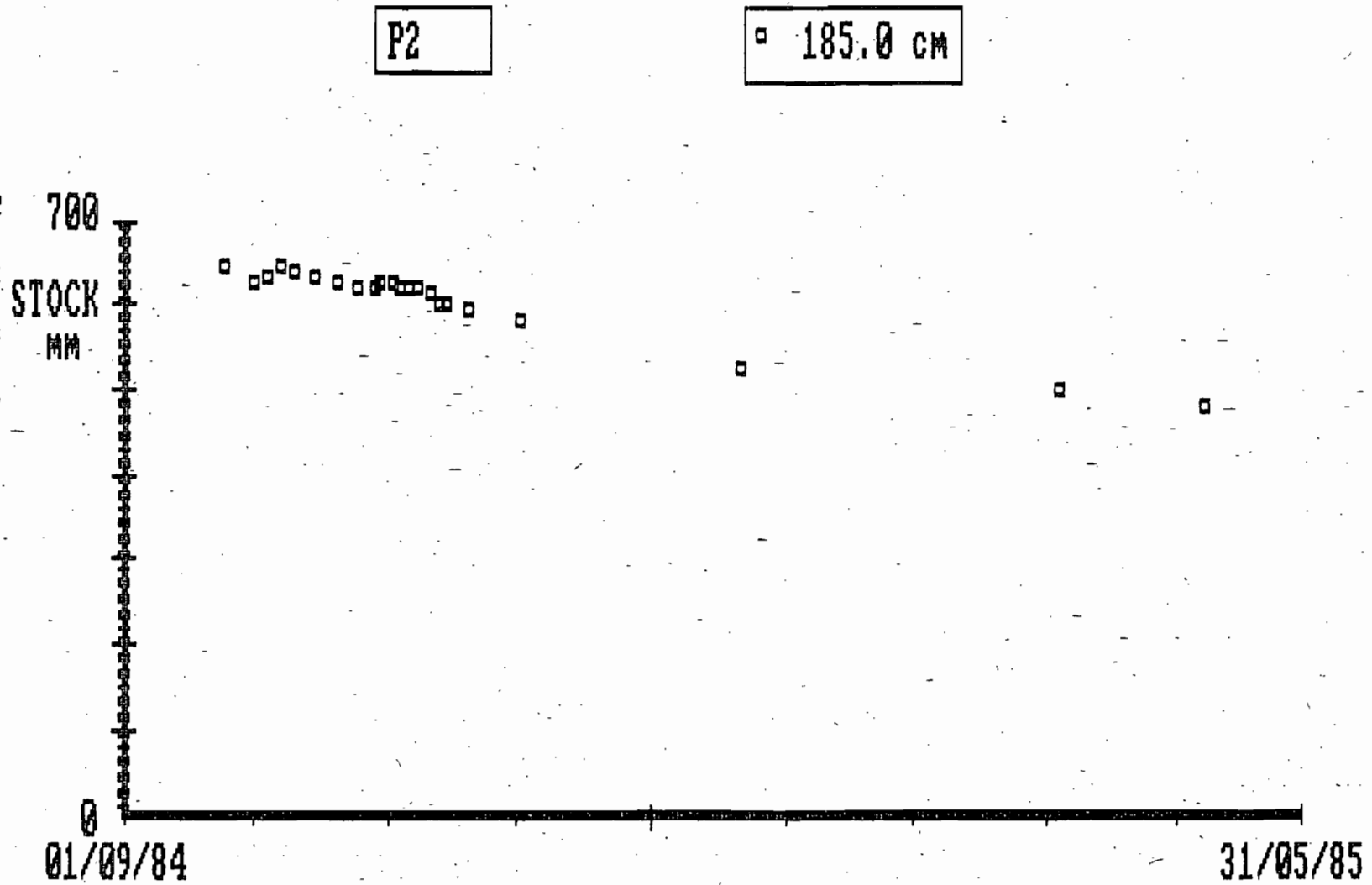
Fig. 12: Koubalan: Variations du stock d'eau
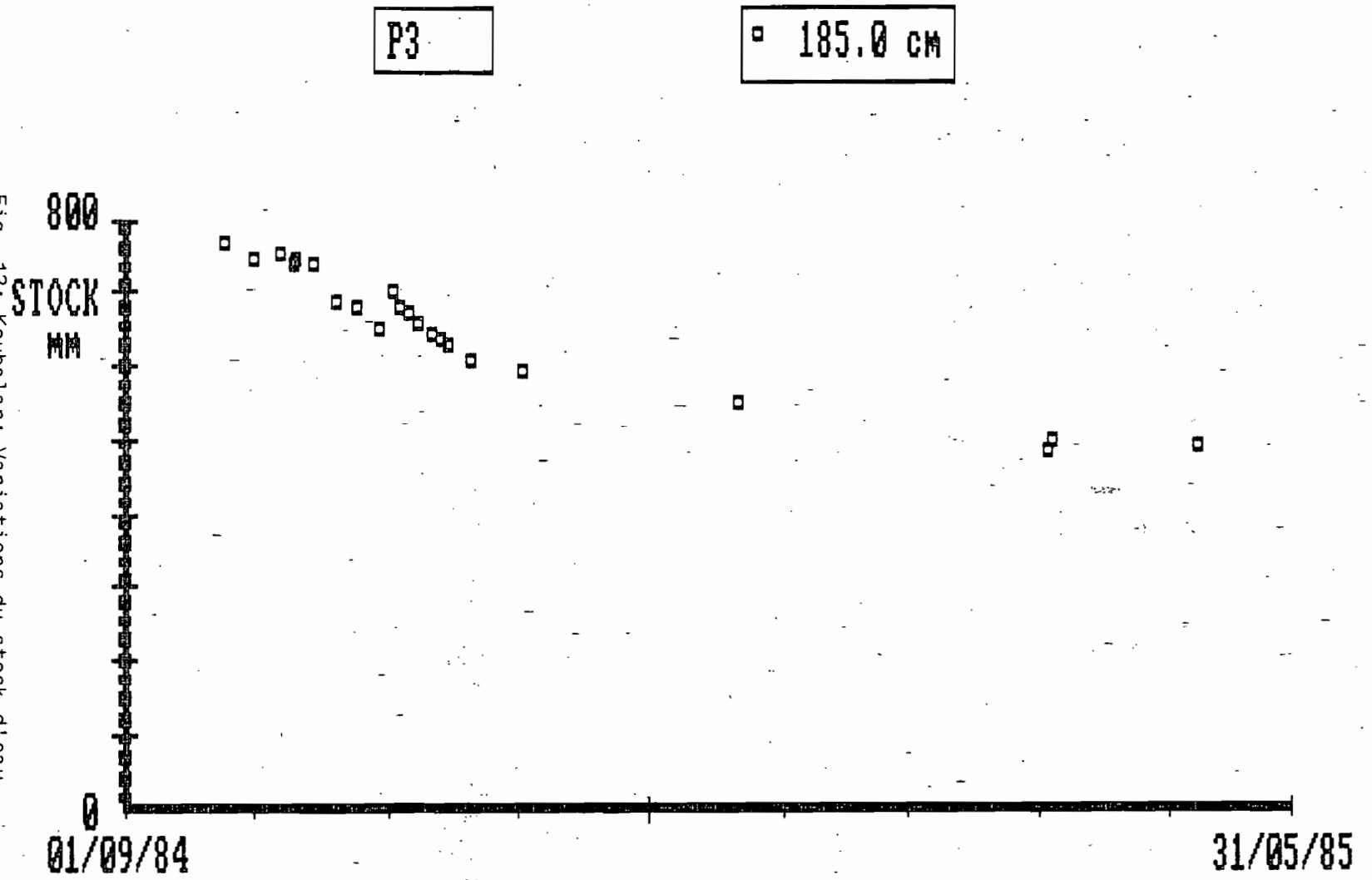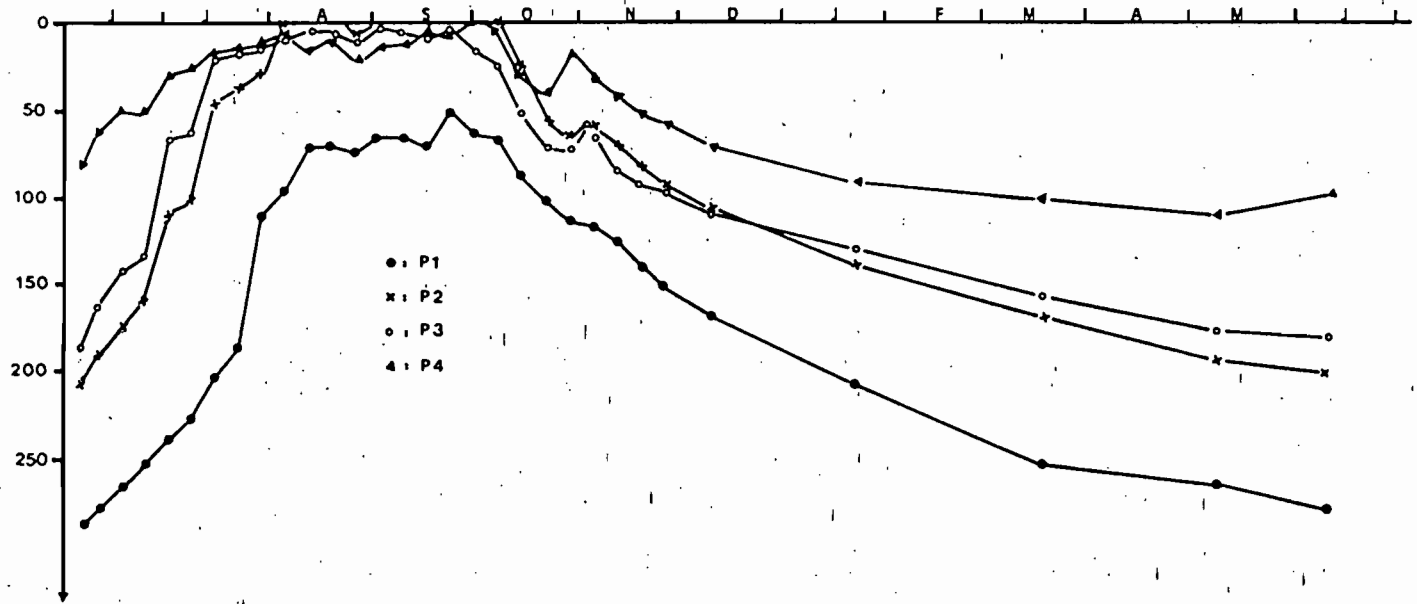
Fig. 13 : Variaitions du niveau de la nappe par rapport au sol
Koubalan 1984-1985
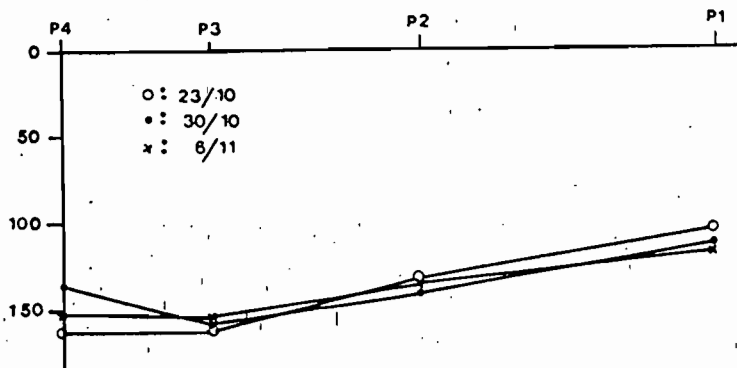
Fig. 14: Variations du niveau de la nappe côtes ramenées
à zéro en P1 - Koubalan

Fig. 15 : Hauteur des pleines et basses mers à l'embouchure de la Casamance 1984 (cm)

Fig. 16 : Koubalan : Profils hydriques

Fig. 17 : Koubalan : Profils hydriques

P2

- 30/10/84
- 02/11/84
- 08/11/84

0,6   3   3
(CM³/CM³)

Z (CM)

185.0

Fig. 18 : Koubalan : Profils hydriques

P1

* 30/10/84
□ 02/11/84
◊ 08/11/84

θ (cm^3/cm^3)

Z (cm)

285.0
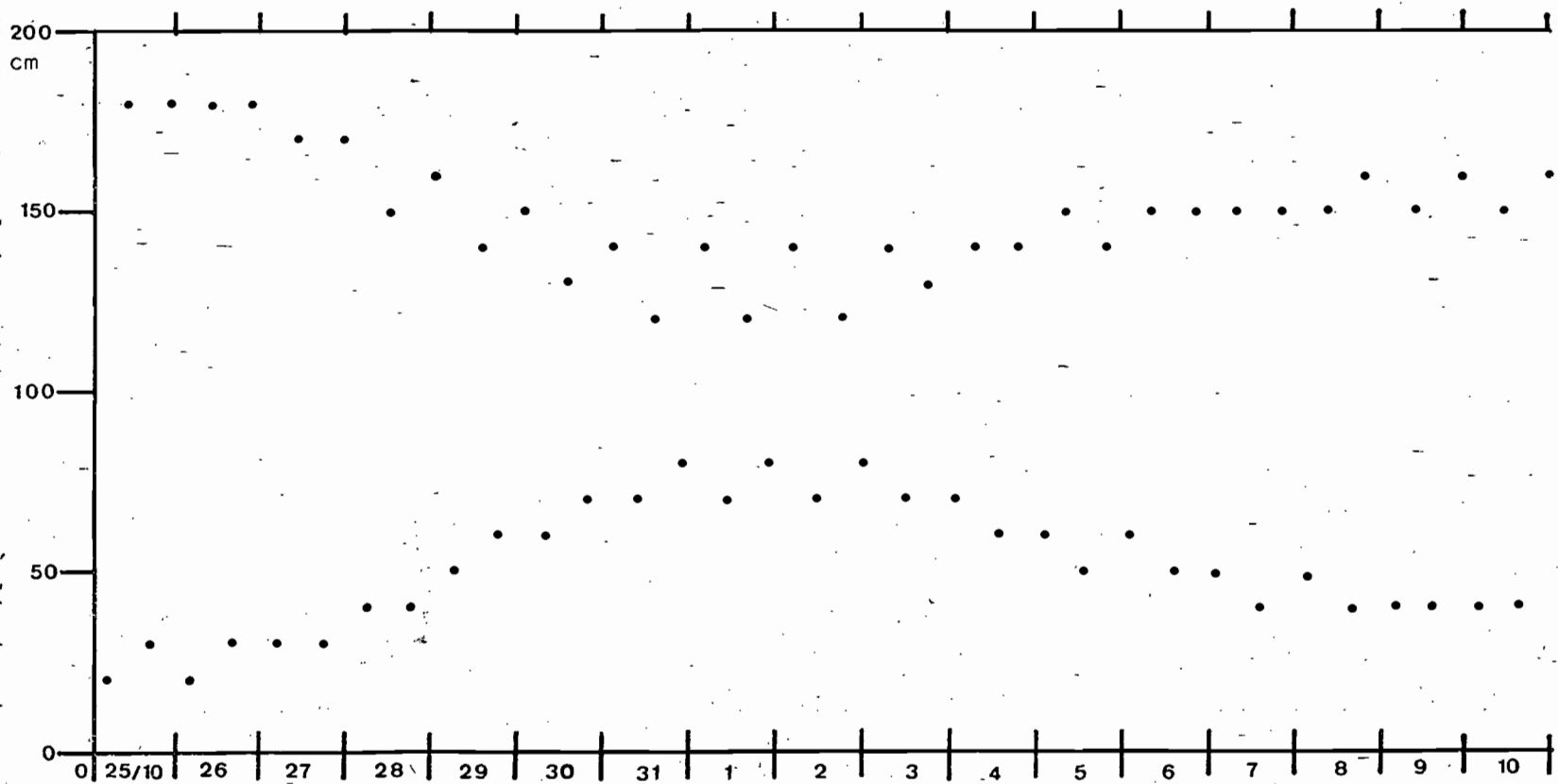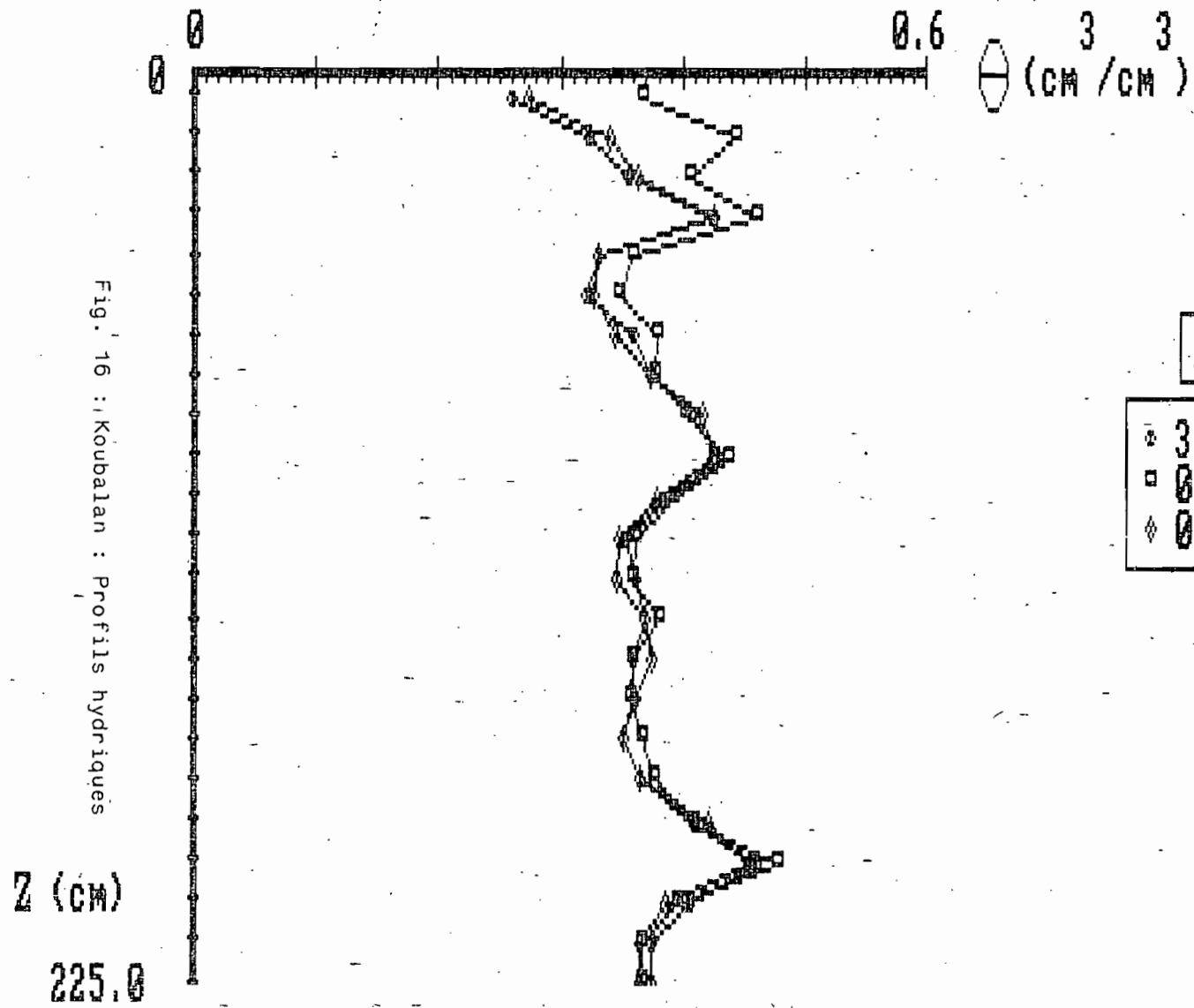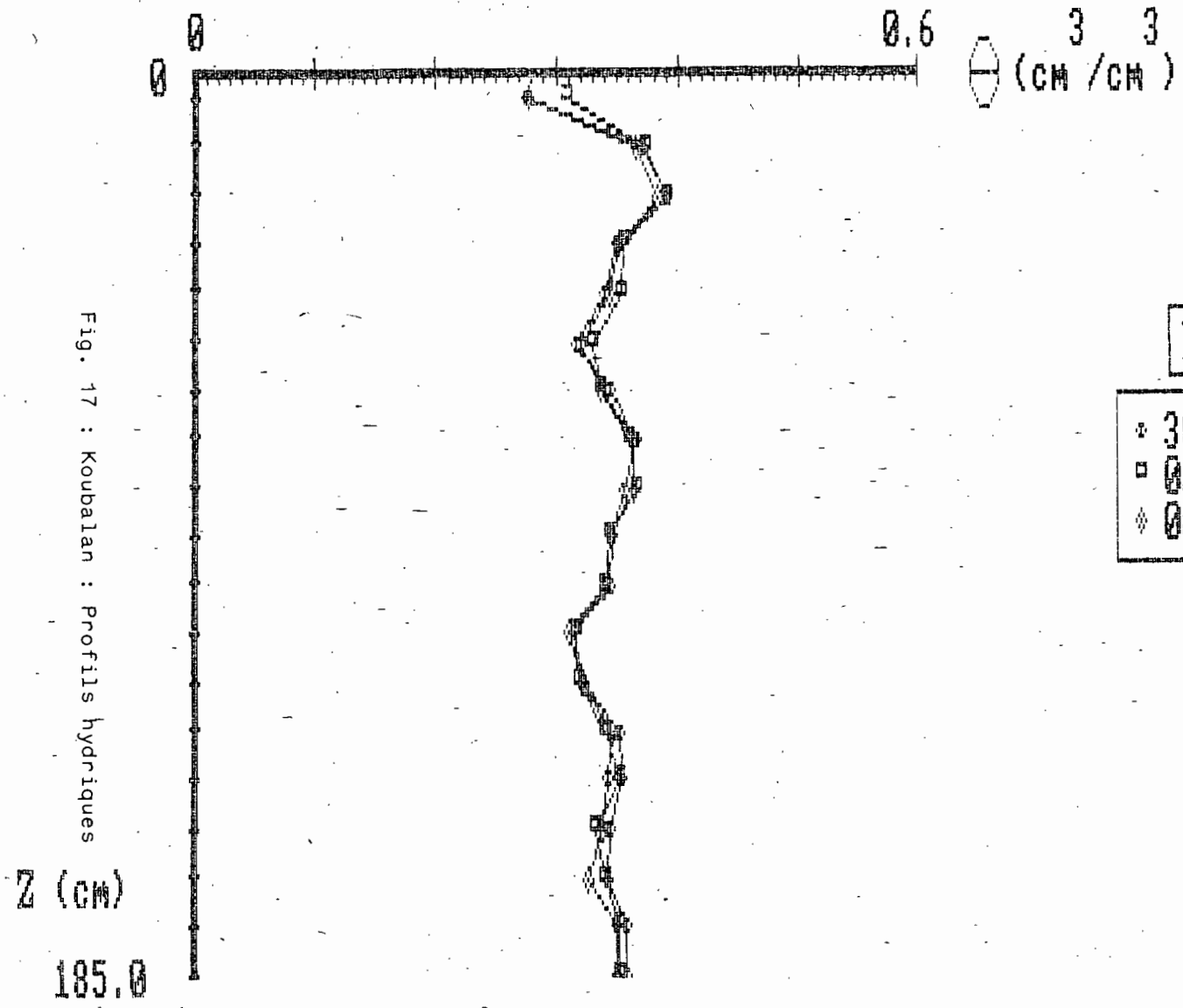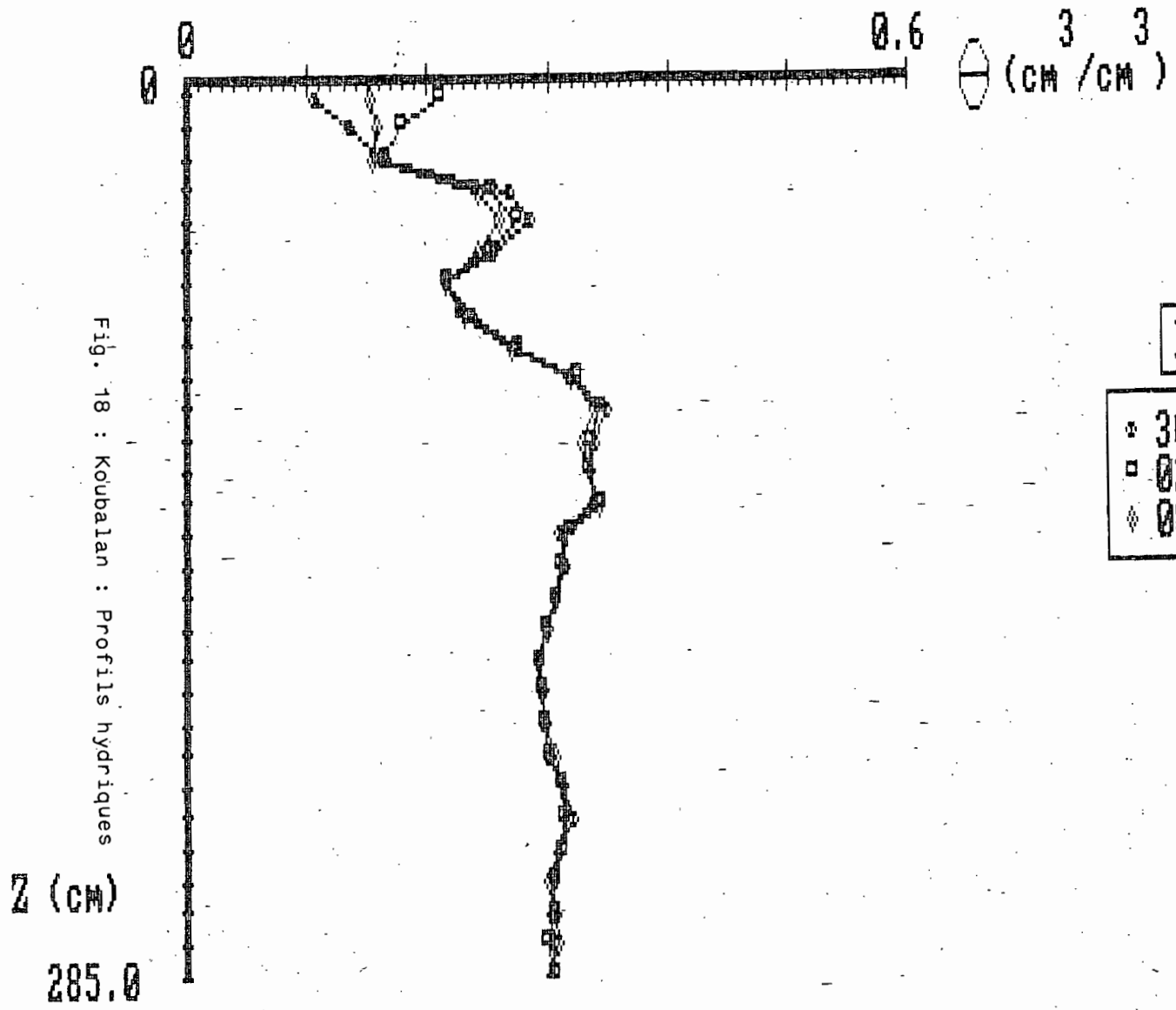
capillaire dûe à la remontée de la nappe mais en P1 (Fig. 18), situé sous la palmeraie, on note une réhumectation des 25 premiers centimètres du profil selon une courbe caractéristique d'infiltration. Ces caractéristiques nous obligent à envisager qu'une pluie non relevée à Koubalan en raison de son occurence tardive, a bien eu lieu à la même date que celle enregistrée à Ziguinchor. Celle-ci correspondrait au minimum à l'augmentation de stock enregistrée au site P1 sur les 25 premiers centimètres du profil soit:14,1mm.

Le tableau 2 ci-dessous donne une idée de la vitesse de dessèchement des différents sites au cours de la saison sèche.

Tableau n°2 Variation des stocks pendant la phase de ressuyage,Koubalan.

DATE	Nbj	P1(0-285)			P2(0-185)			P3(0-185)		
		S	Δ S	mm/J	S	ΔS	mm/j	S	Δ S	mm/j
15/10/84		841,8			645,1			752,6		
	15		-40,7	-2,71		-6,5	-0,43		-81,7	-5,44
30/10/84		801,1			638,6			670,9		
	3		+8,7	+2,9		+1,4	+0,46		+45,3	+15,1
2/11/84		809,8			640,0			716,2		
	6		-30,2	-5,3		-7,9	-1,31		-41,8	-6,96
8/11/84		779,6			632,1			674,4		
	24		-41,6	-1,73		-38,0	-1,58		-66,0	-2,75
2/12/84		738,0			594,1			608,4		
	51		-63,8	-1,25		-56,1	-1,10		-43,3	-0,85
22/01/85		674,2			538,0			565,1		
	72		-61,1	-0,85		-22,0	-0,30		-50,7	-0,70
04/04/85		613,1			516,0			514,4		
	35		-42,2	-1,20		-23,3	-0,66		-7,8	-0,22
09/05/85		570,9			492,7			506,6		

TABLEAU 3 : KOUBALAN : PLUVIOMETRIE MOYENNE EN 1984

JOUR	JUIN	JUILLET	AOÛT	SEPTEMBRE	OCTOBRE
1			44,0		
2	19,1	1,0	31,3	0,5	6,9
3				44,6	10,4
4	8,2	1,0	2,7	7,2	3,9
5					
6		1,2			1,8
7		2,6	1,3		
8	22,7	25,9		24,9	
9		16,5		16,3	
10		1,2			
11	13,8		1,1		
12		3,9	71,8		
13		8,9		28,2	
14		0,2			
15		40,7	1,1	6,8	
16	18,5			1,2	
17		23,9	2,6		
18			15,3		
19		2,5	12,8	1,1	
20	16,1	0,8		57,7	
21		10,9	0,2		
22			21,8	4,9	
23	13,3	22,8		18,2	
24	2,2				
25	16,9				
26	35,7				
27	35,9	10,0	7,1		
28	8,0				
29				2,1	
30		40,6	23,2		
31		31,4	13,3		
TOTAL	210,4	246,0	249,6	213,7	23,0
ANNEE					942,7

A N N E X E I

GRAPHIQUES DES DROITES D'ETALONNAGE

P1: 0-20

P1 : 60 — 140

P1 : 140~290

Hv%

●	150
✕	170
○	190
✦	210
△	230
□	250
▽	270
▼	290

30

20

10

0   100   200   300   400   500   600 TNAJ

P2: 40 — 110

P2 : 110 _ 190

P3: 0 — 20

P3 : 20 — 40
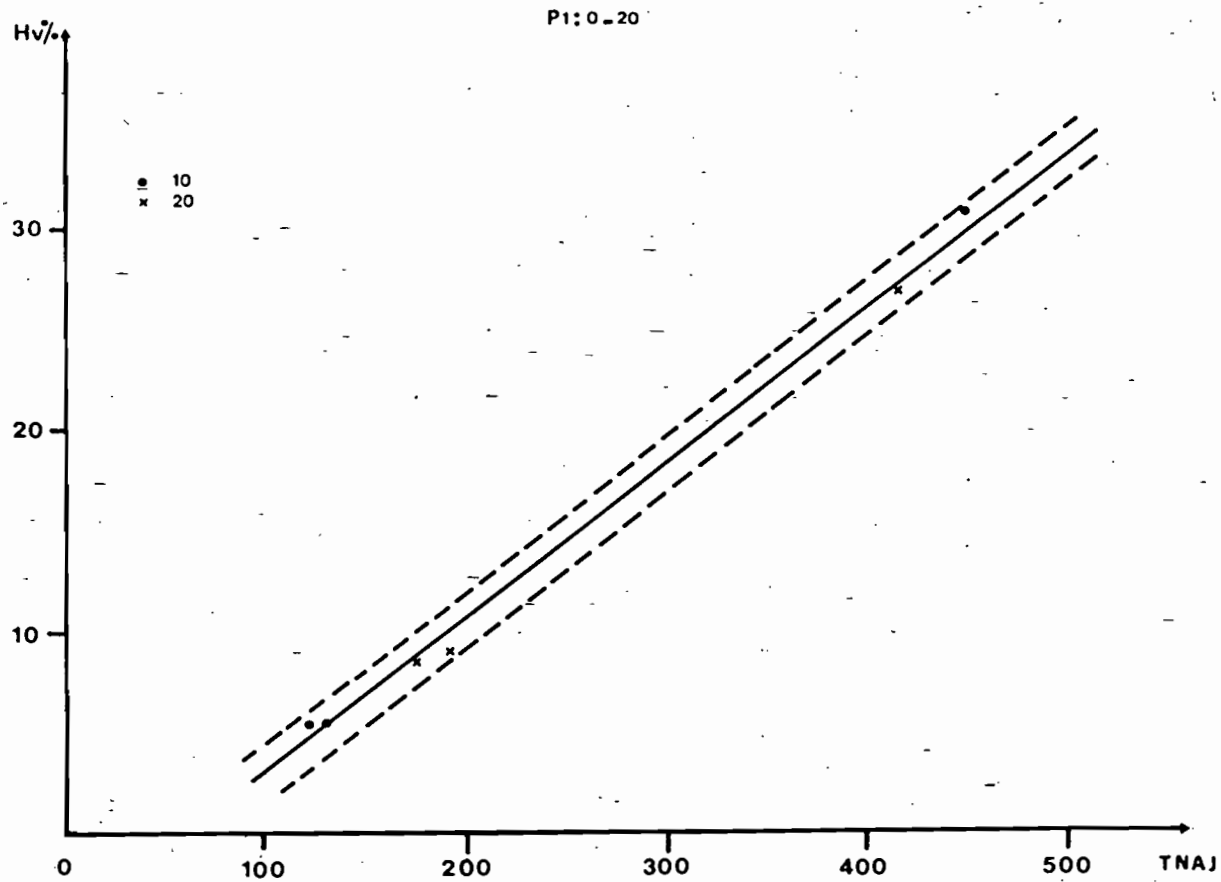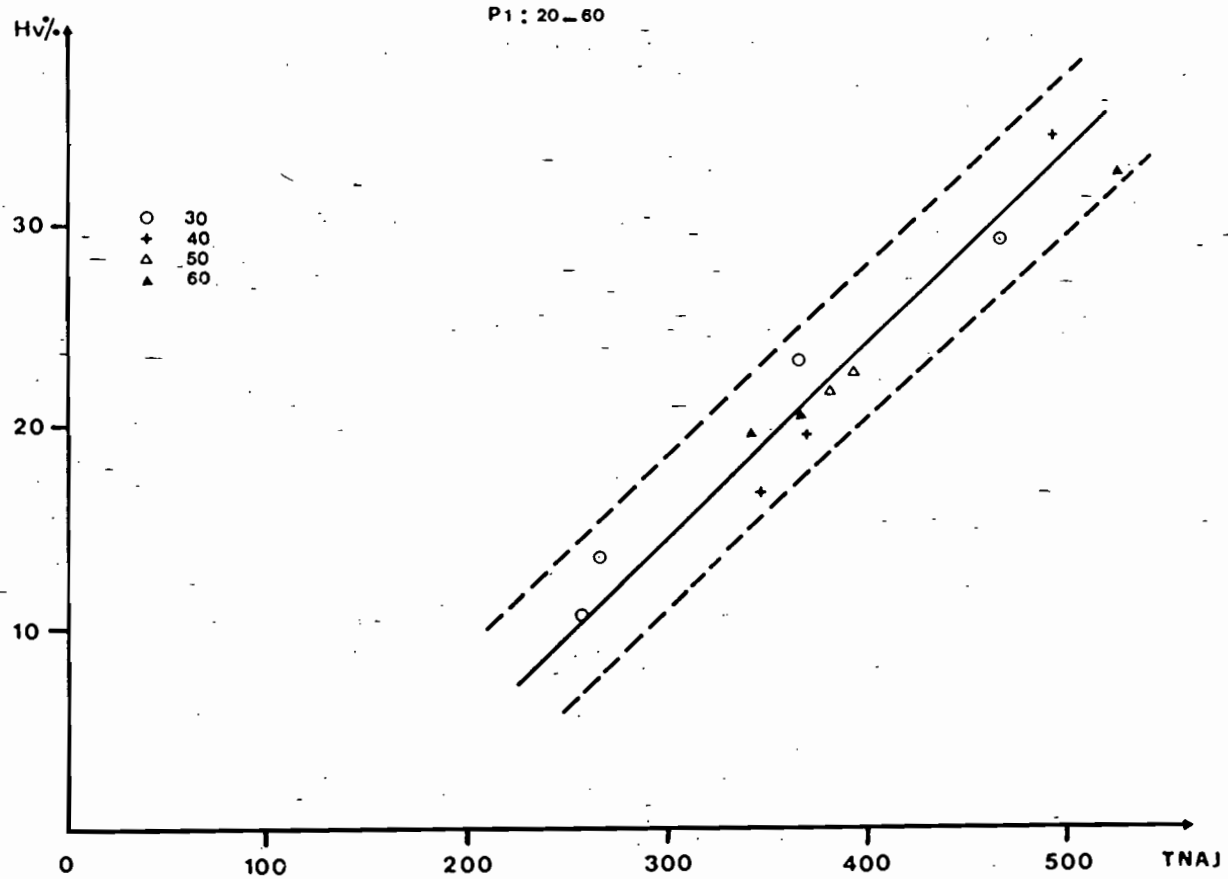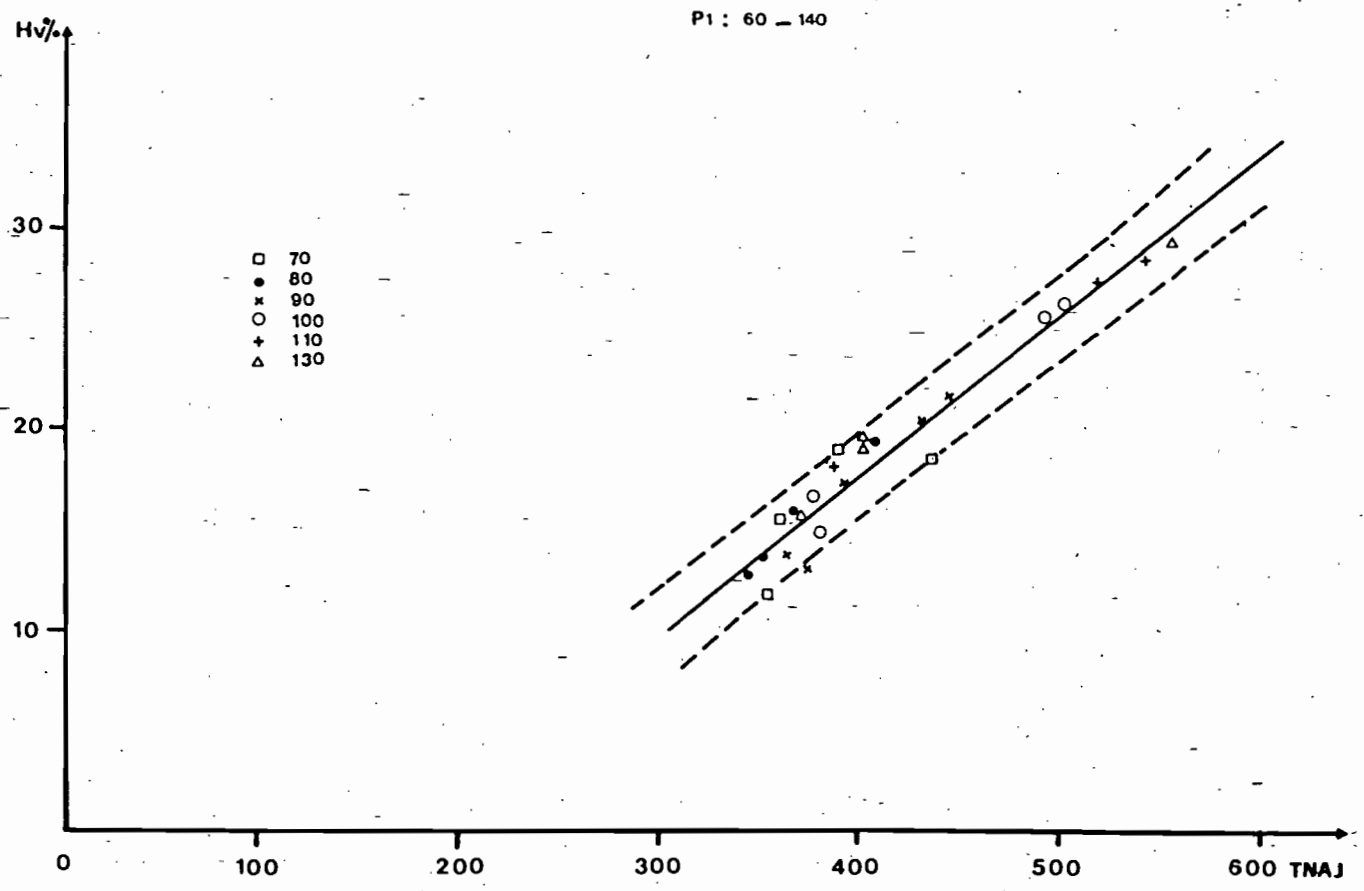
P3: 80 — 150
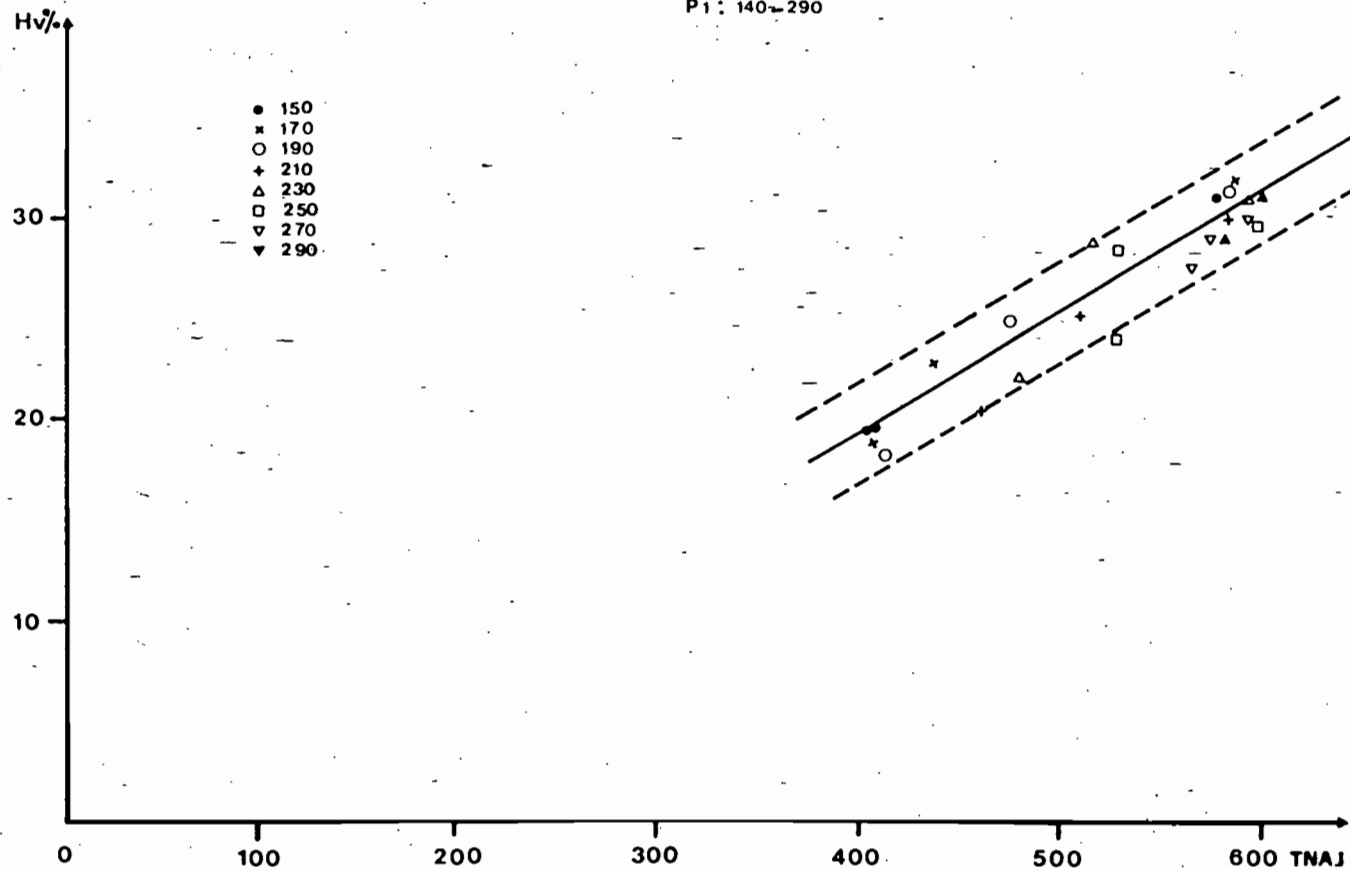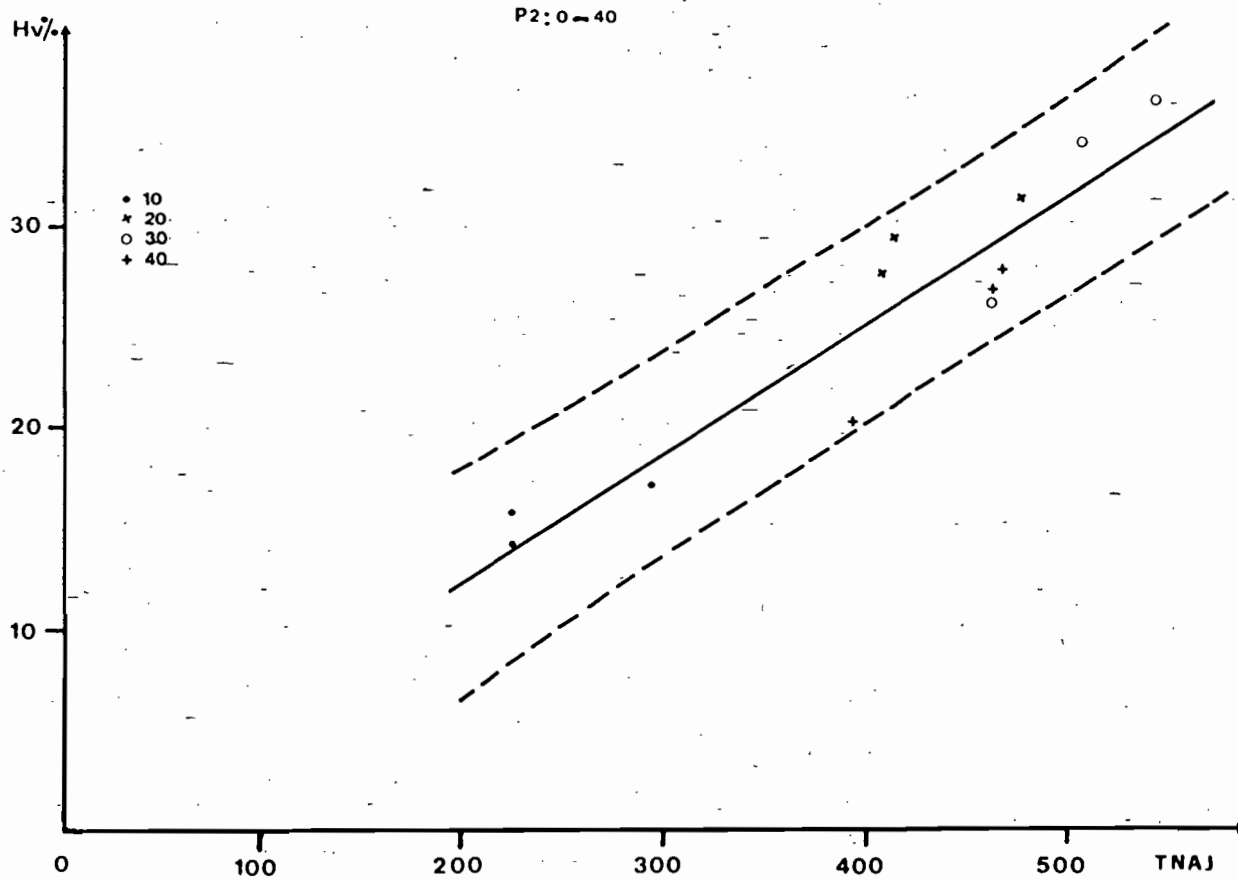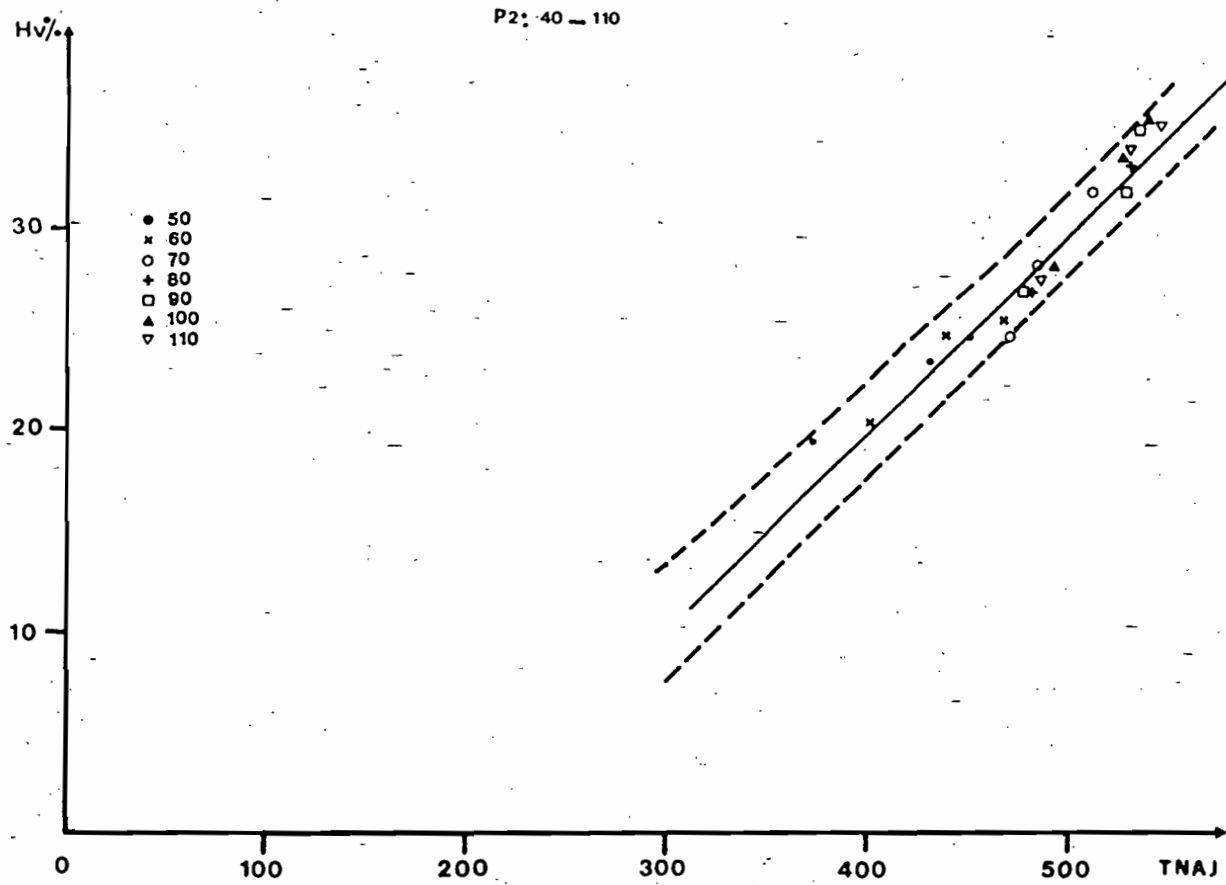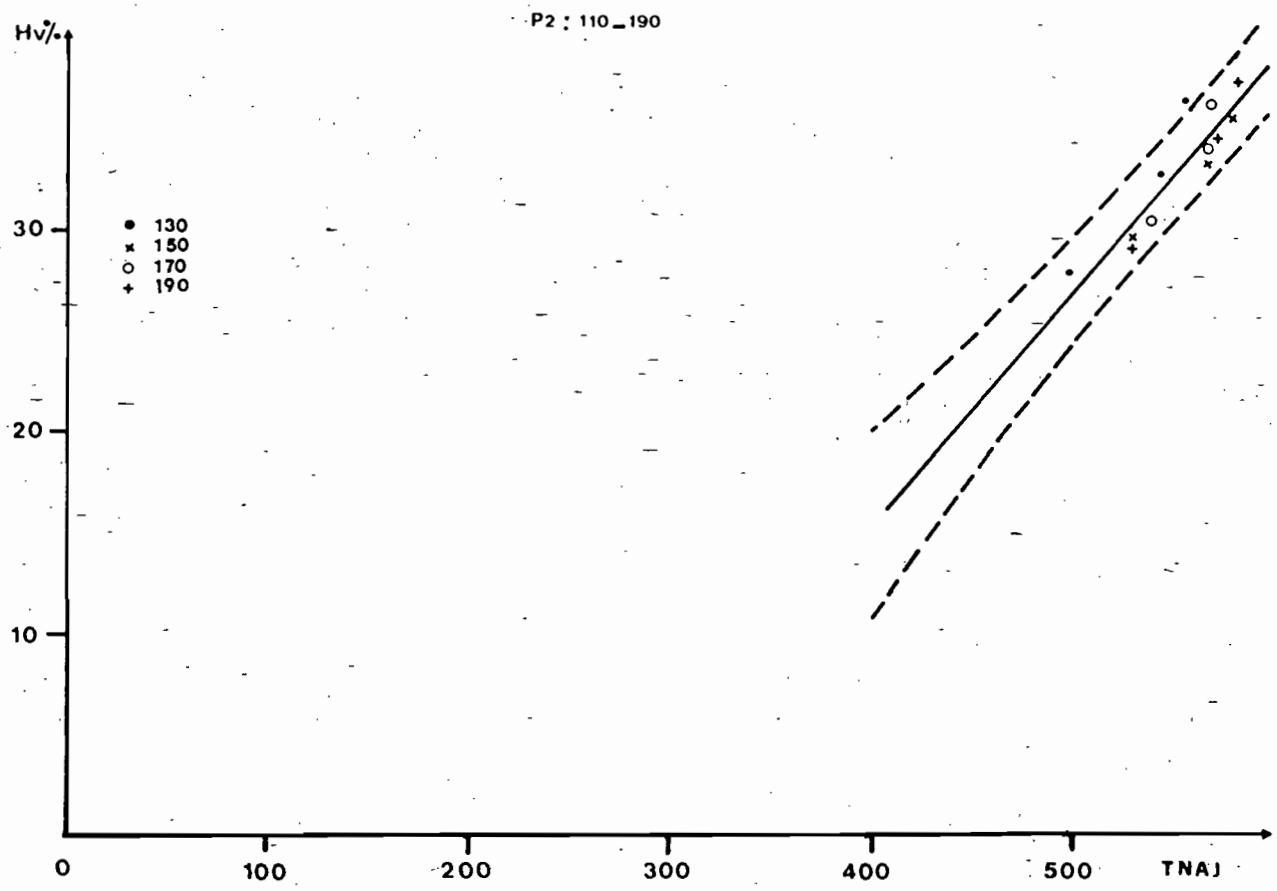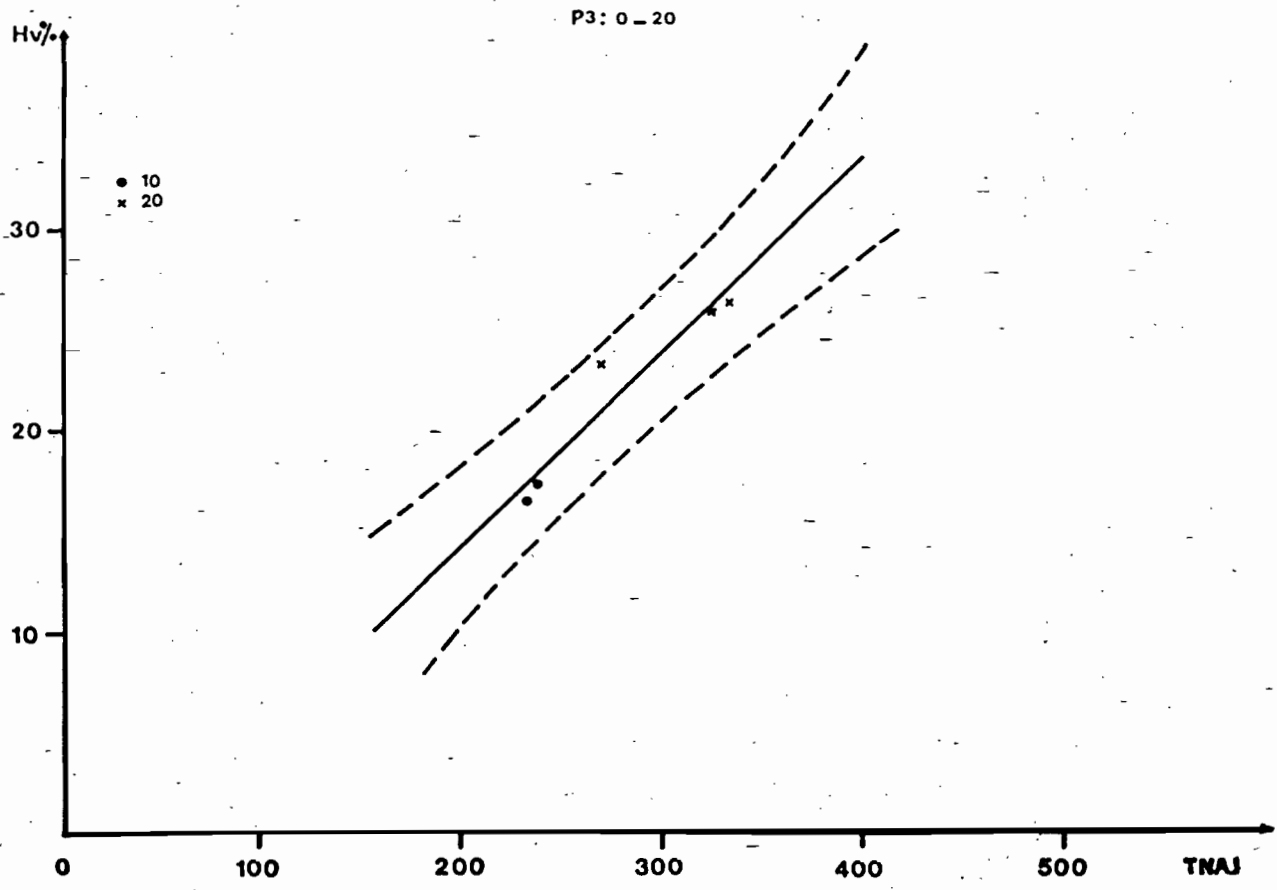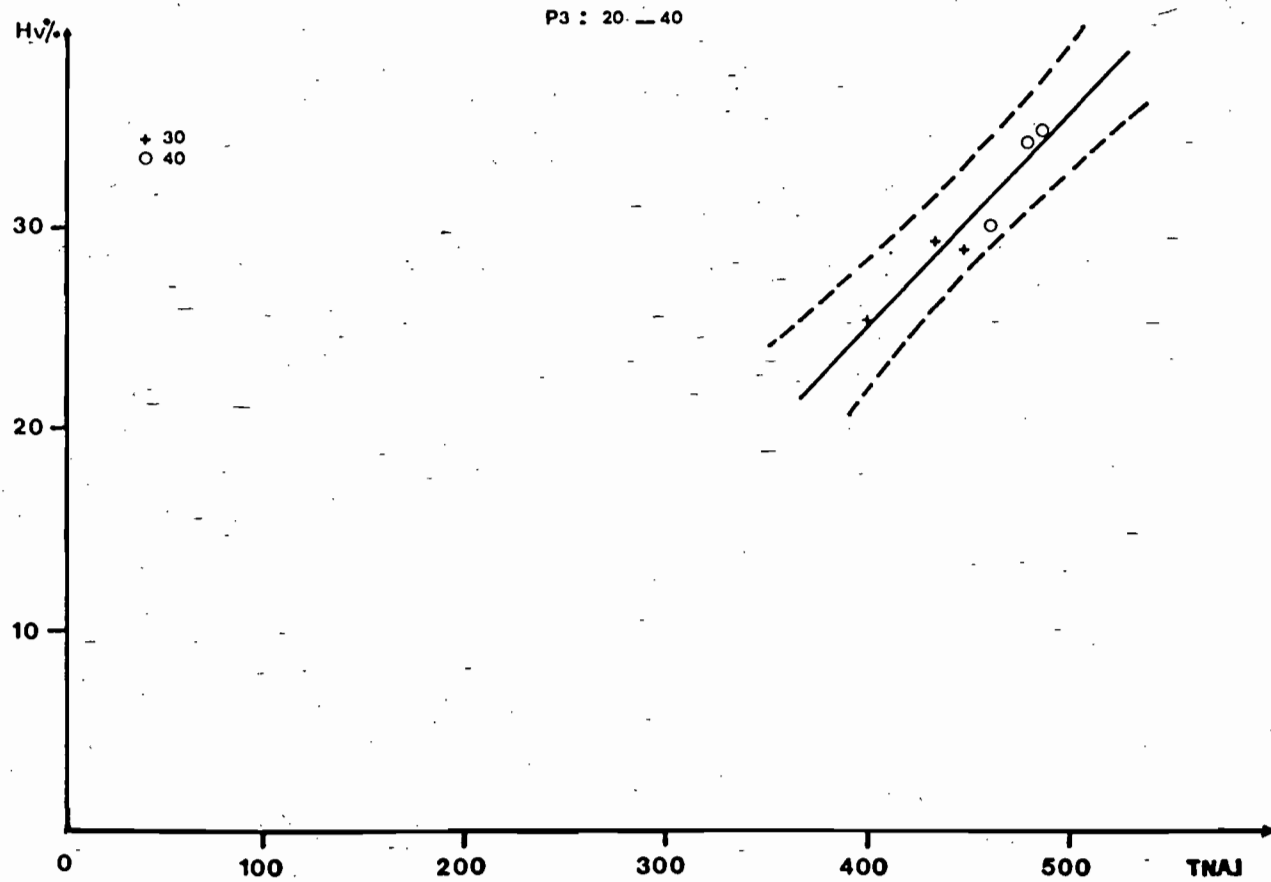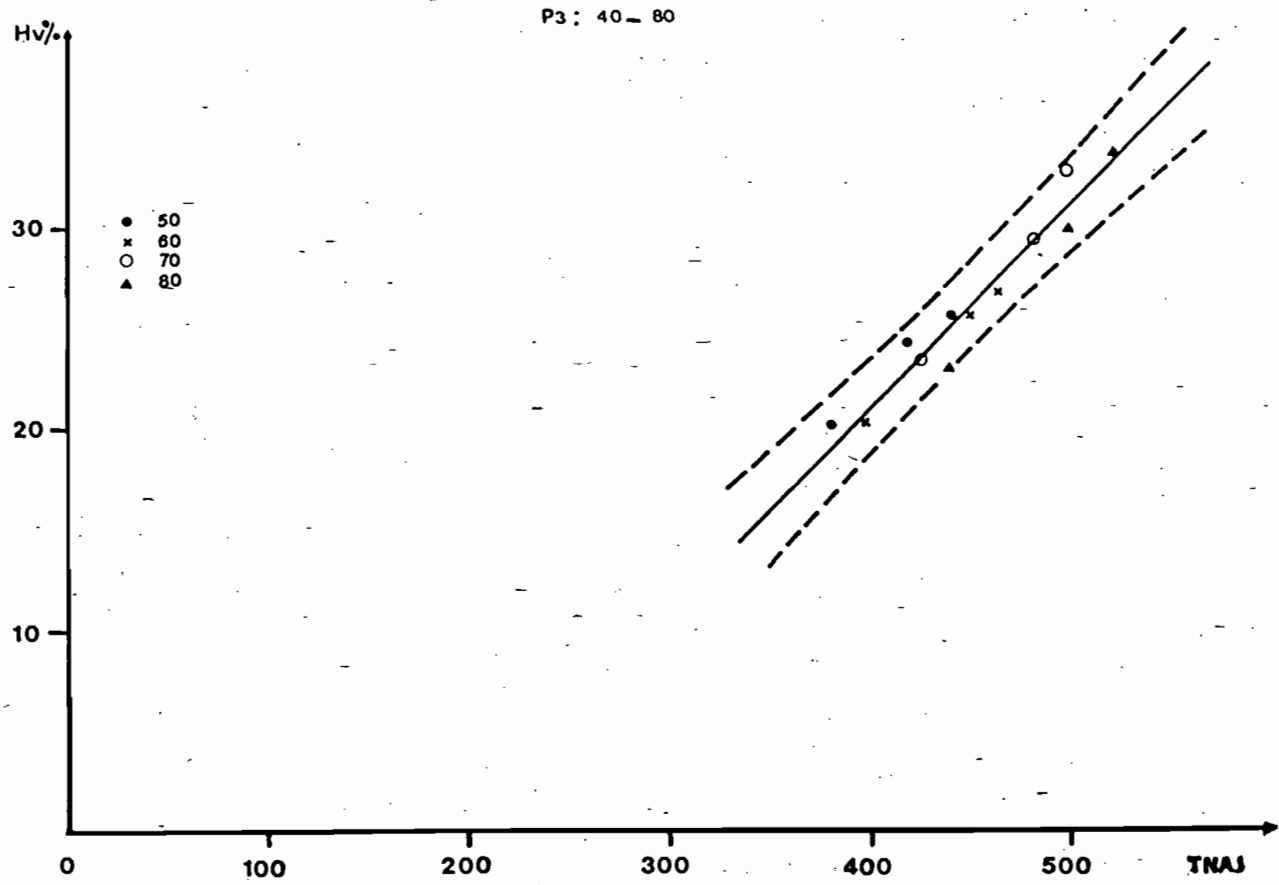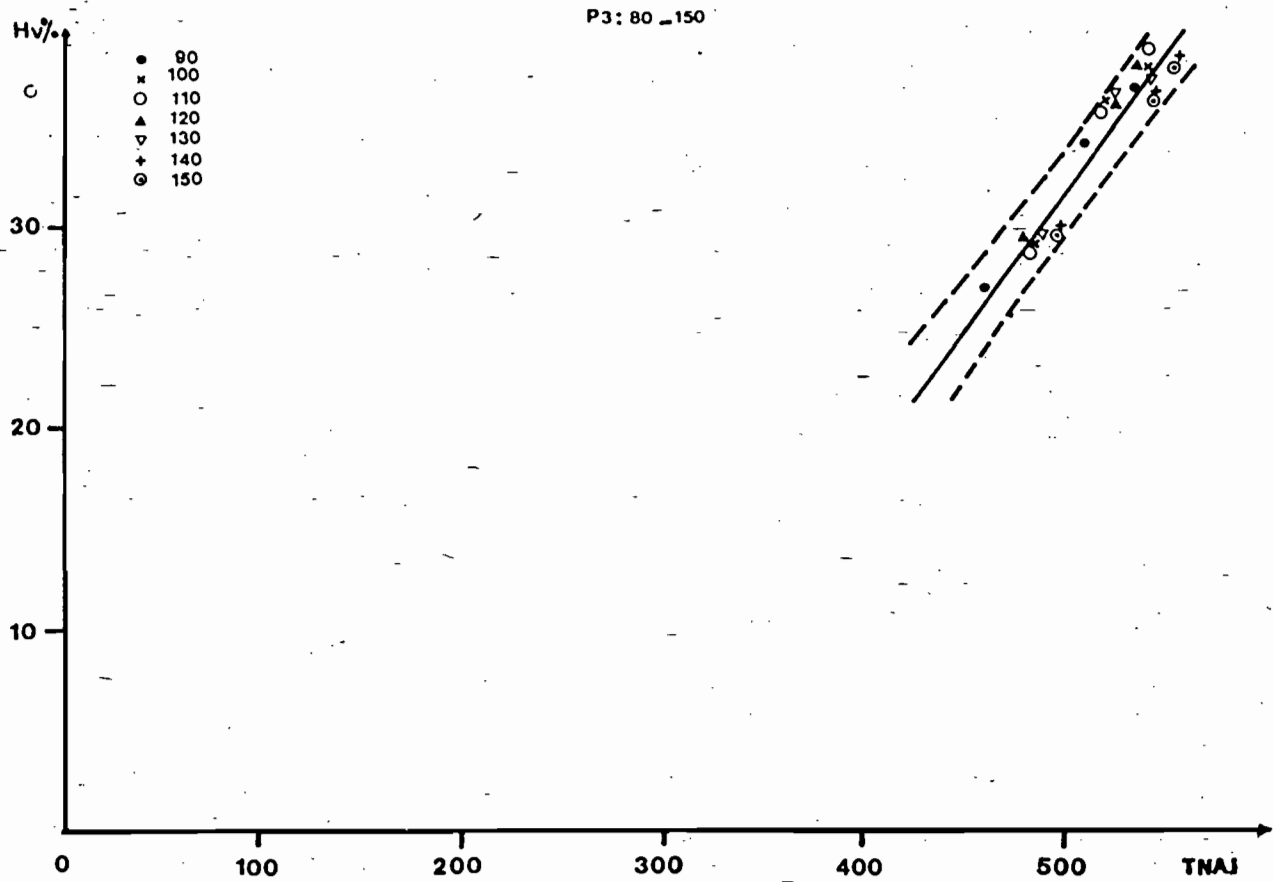
A N N E X E   II

TABLEAUX DES HUMIDITES VOLUMIQUES ET DES STOCKS

TENEURS EN EAU   P1

Z	16/ 5/84	11/ 6/84	22/ 6/84	29/ 6/84	3/ 8/84	13/ 8/84	24/ 9/84
5.0	.046	.163	.190	.264	.295	.285	.291
15.0	.089	.146	.203	.274	.298	.283	.297
25.0	.106	.111	.159	.276	.308	.291	.315
35.0	.188	.195	.210	.330	.363	.345	.379
45.0	.221	.218	.223	.338	.379	.357	.422
55.0	.185	.182	.179	.254	.319	.310	.389
65.0	.140	.134	.138	.174	.298	.289	.303
75.0	.140	.133	.131	.138	.294	.292	.288
85.0	.158	.149	.146	.144	.319	.322	.319
95.0	.160	.163	.154	.145	.350	.351	.348
105.0	.168	.172	.169	.164	.349	.355	.354
115.0	.176	.173	.173	.166	.341	.344	.327
125.0	.169	.170	.171	.162	.336	.343	.323
135.0	.180	.176	.176	.172	.339	.345	.343
145.0	.192	.194	.191	.191	.313	.312	.307
155.0	.197	.191	.192	.188	.311	.315	.309
165.0	.195	.195	.195	.192	.303	.307	.305
175.0	.197	.195	.194	.191	.296	.302	.301
185.0	.200	.204	.200	.199	.295	.293	.283
195.0	.211	.218	.216	.214	.290	.293	.289
205.0	.229	.228	.230	.228	.300	.303	.292
215.0	.236	.234	.239	.244	.313	.310	.297
225.0	.240	.238	.243	.262	.317	.318	.310
235.0	.250	.251	.250	.297	.333	.323	.316
245.0	.269	.266	.267	.300	.328	.315	.308
255.0	.283	.279	.286	.296	.312	.309	.297
265.0	.290	.290	.297	.295	.311	.306	.304
275.0	.290	.296	.299	.298	.296	.306	.297
285.0	.300	.306	.303	.291	.307	.305	.306

TENEURS EN EAU   P1

Z	24/ 9/84	1/10/84	15/10/84	2/11/84	2/12/84	22/ 1/85	4/ 4/85	9/ 5/85
5.0	.291	.237	.189	.209	.081	.067	.026	.054
15.0	.297	.272	.229	.178	.110	.094	.085	.085
25.0	.315	.303	.255	.164	.115	.110	.105	.097
35.0	.379	.363	.330	.253	.210	.206	.189	.192
45.0	.422	.384	.347	.274	.221	.215	.211	.213
55.0	.389	.334	.283	.252	.185	.182	.192	.177
65.0	.303	.300	.233	.215	.148	.136	.136	.138
75.0	.288	.296	.257	.227	.172	.142	.145	.131
85.0	.319	.326	.312	.274	.225	.163	.156	.146
95.0	.348	.364	.345	.322	.277	.176	.173	.159
105.0	.354	.358	.340	.341	.298	.214	.183	.168
115.0	.327	.346	.325	.335	.295	.231	.194	.174
125.0	.323	.333	.322	.332	.299	.252	.209	.175
135.0	.343	.344	.333	.343	.321	.279	.216	.178
145.0	.307	.315	.302	.317	.310	.272	.231	.194
155.0	.309	.315	.307	.309	.313	.274	.234	.204
165.0	.305	.307	.296	.304	.305	.272	.241	.210
175.0	.301	.302	.292	.297	.300	.280	.248	.226
185.0	.283	.296	.289	.292	.291	.283	.260	.234
195.0	.289	.297	.285	.293	.296	.288	.272	.244
205.0	.292	.296	.291	.295	.300	.299	.275	.254
215.0	.297	.302	.292	.299	.302	.307	.273	.255
225.0	.310	.310	.300	.309	.312	.316	.267	.257
235.0	.316	.320	.310	.310	.315	.315	.267	.261
245.0	.308	.315	.299	.309	.308	.305	.271	.264
255.0	.297	.307	.302	.302	.309	.303	.295	.279
265.0	.304	.305	.299	.302	.302	.300	.303	.291
275.0	.297	.305	.296	.297	.302	.302	.305	.290
285.0	.306	.305	.297	.303	.302	.306	.311	.301

TENEURS EN EAU   P1

Z	16/ 5/84	11/ 6/84	22/ 6/84	29/ 6/84	16/ 7/84	24/ 7/84	29/ 7/84	3/ 8/84
5.0	.046	.163	.190	.264	.282	.297	.252	.295
15.0	.089	.146	.203	.274	.292	.306	.256	.298
25.0	.106	.111	.159	.276	.302	.309	.266	.308
35.0	.188	.195	.210	.330	.357	.369	.339	.363
45.0	.221	.218	.223	.338	.368	.375	.347	.379
55.0	.185	.182	.179	.254	.289	.291	.272	.319
65.0	.140	.134	.138	.174	.224	.215	.217	.298
75.0	.140	.133	.131	.138	.217	.218	.208	.294
85.0	.158	.149	.146	.144	.213	.235	.228	.319
95.0	.160	.163	.154	.145	.183	.263	.254	.350
105.0	.168	.172	.169	.164	.173	.263	.272	.349
115.0	.176	.173	.173	.166	.171	.253	.263	.341
125.0	.169	.170	.171	.162	.166	.209	.256	.336
135.0	.180	.176	.176	.172	.177	.201	.267	.339
145.0	.192	.194	.191	.191	.192	.228	.268	.313
155.0	.197	.191	.192	.188	.191	.257	.268	.311
165.0	.195	.195	.195	.192	.199	.268	.280	.303
175.0	.197	.195	.194	.191	.207	.276	.288	.296
185.0	.200	.204	.200	.199	.234	.282	.280	.295
195.0	.211	.218	.216	.214	.256	.286	.283	.290
205.0	.229	.228	.230	.228	.283	.298	.288	.300
215.0	.236	.234	.239	.244	.292	.296	.293	.313
225.0	.240	.238	.243	.262	.303	.309	.302	.317
235.0	.250	.251	.250	.297	.312	.320	.307	.333
245.0	.269	.266	.267	.300	.305	.312	.302	.328
255.0	.283	.279	.286	.296	.302	.311	.302	.312
265.0	.290	.290	.297	.295	.303	.311	.302	.311
275.0	.290	.296	.299	.298	.299	.309	.302	.296
285.0	.300	.306	.303	.291	.299	.312	.300	.307

TENEURS EN EAU   P1

Z	30/10/84	2/11/84	8/11/84
5.0	.105	.209	.153
15.0	.135	.178	.158
25.0	.162	.164	.155
35.0	.268	.253	.242
45.0	.285	.274	.260
55.0	.255	.252	.242
65.0	.215	.215	.215
75.0	.236	.227	.231
85.0	.274	.274	.270
95.0	.317	.322	.318
105.0	.348	.341	.337
115.0	.337	.335	.329
125.0	.335	.332	.334
135.0	.336	.343	.343
145.0	.308	.317	.312
155.0	.313	.309	.310
165.0	.306	.304	.305
175.0	.297	.297	.299
185.0	.290	.292	.292
195.0	.296	.293	.294
205.0	.295	.295	.297
215.0	.299	.299	.305
225.0	.311	.309	.310
235.0	.318	.310	.315
245.0	.307	.309	.307
255.0	.303	.302	.300
265.0	.300	.302	.305
275.0	.302	.297	.307
285.0	.302	.303	.300

TENEURS EN EAU   P2

Z	16/ 5/84	11/ 6/84	22/ 6/84	29/ 6/84	3/ 8/84	13/ 8/84	24/ 9/84
5.0	.220	.228	.258	.294	.371	.375	.369
15.0	.255	.313	.345	.362	.402	.403	.404
25.0	.288	.322	.368	.373	.412	.417	.418
35.0	.245	.260	.313	.326	.370	.369	.362
45.0	.173	.186	.270	.306	.364	.371	.349
55.0	.200	.194	.236	.268	.337	.338	.337
65.0	.266	.254	.266	.295	.353	.353	.346
75.0	.279	.300	.286	.333	.365	.368	.364
85.0	.277	.279	.286	.333	.367	.371	.374
95.0	.287	.288	.285	.332	.356	.355	.346
105.0	.281	.285	.286	.319	.349	.338	.345
115.0	.246	.250	.264	.301	.323	.327	.322
125.0	.266	.268	.274	.310	.325	.340	.330
135.0	.282	.289	.297	.339	.349	.368	.357
145.0	.302	.309	.308	.351	.365	.368	.358
155.0	.308	.306	.301	.327	.351	.355	.338
165.0	.314	.316	.331	.339	.346	.356	.338
175.0	.314	.351	.347	.355	.360	.367	.358
185.0	.306	.351	.347	.355	.360	.367	.358

TENEURS EN EAU   P2

Z	24/ 9/84	1/10/84	2/11/84	15/11/84	2/12/84	22/ 1/85	5/ 4/85	9/ 5/85
5.0	.369	.355	.309	.232	.181	.156	.126	.130
15.0	.404	.397	.373	.348	.308	.269	.248	.204
25.0	.418	.404	.390	.379	.347	.295	.284	.301
35.0	.362	.362	.356	.339	.316	.242	.253	.269
45.0	.349	.355	.354	.322	.283	.190	.182	.185
55.0	.337	.329	.330	.296	.265	.236	.210	.182
65.0	.346	.334	.336	.319	.310	.289	.265	.237
75.0	.364	.355	.360	.354	.331	.298	.294	.287
85.0	.374	.356	.366	.362	.336	.303	.295	.296
95.0	.346	.331	.344	.345	.349	.306	.301	.292
105.0	.345	.337	.340	.331	.344	.308	.300	.299
115.0	.322	.313	.316	.314	.316	.286	.274	.252
125.0	.330	.313	.319	.316	.321	.300	.288	.274
135.0	.357	.350	.340	.340	.343	.336	.305	.286
145.0	.358	.350	.352	.343	.342	.343	.319	.300
155.0	.338	.330	.332	.340	.341	.342	.327	.304
165.0	.338	.330	.340	.340	.347	.330	.331	.324
175.0	.358	.344	.351	.357	.353	.348	.346	.321
185.0	.358	.344	.351	.357	.353	.348	.364	.327

TENEURS EN EAU   P2

Z	16/ 5/84	11/ 6/84	22/ 6/84	29/ 6/84	16/ 7/84	24/ 7/84	29/ 7/84	3/ 8/84
5.0	.220	.228	.258	.294	.311	.321	.272	.371
15.0	.255	.313	.345	.362	.379	.390	.357	.402
25.0	.288	.322	.368	.373	.395	.415	.386	.412
35.0	.245	.260	.313	.326	.351	.363	.343	.370
45.0	.173	.186	.270	.306	.325	.354	.331	.364
55.0	.200	.194	.236	.268	.318	.341	.315	.337
65.0	.266	.254	.266	.295	.336	.340	.338	.353
75.0	.279	.300	.286	.333	.355	.366	.354	.365
85.0	.277	.279	.286	.333	.360	.367	.362	.367
95.0	.287	.288	.285	.332	.349	.354	.345	.356
105.0	.281	.285	.286	.319	.339	.345	.329	.349
115.0	.246	.250	.264	.301	.304	.325	.313	.323
125.0	.266	.268	.274	.310	.319	.330	.323	.325
135.0	.282	.289	.297	.339	.348	.360	.341	.349
145.0	.302	.309	.308	.351	.346	.364	.356	.365
155.0	.308	.306	.301	.327	.349	.350	.332	.351
165.0	.314	.316	.331	.339	.343	.356	.346	.346
175.0	.314	.351	.347	.355	.359	.364	.363	.360
185.0	.306	.351	.347	.355	.359	.364	.363	.360

TENEURS EN EAU   P2

Z	30/10/84	2/11/84	8/11/84
5.0	.276	.309	.277
15.0	.372	.373	.366
25.0	.390	.390	.384
35.0	.350	.356	.351
45.0	.341	.354	.344
55.0	.316	.330	.321
65.0	.344	.336	.337
75.0	.366	.360	.364
85.0	.355	.366	.363
95.0	.345	.344	.344
105.0	.344	.340	.341
115.0	.315	.316	.310
125.0	.322	.319	.321
135.0	.351	.340	.346
145.0	.353	.352	.342
155.0	.343	.332	.338
165.0	.342	.340	.326
175.0	.358	.351	.350
185.0	.358	.351	.350

TENEURS EN EAU P3

Z	16/ 5/84	11/ 6/84	22/ 6/84	29/ 6/84	3/ 8/84	13/ 8/84	24/ 9/84
5.0	.173	.268	.316	.365	.574	.566	.564
15.0	.208	.373	.403	.466	.561	.561	.556
25.0	.248	.349	.379	.457	.516	.532	.517
35.0	.315	.349	.399	.507	.535	.551	.542
45.0	.229	.244	.283	.395	.419	.423	.418
55.0	.207	.207	.241	.355	.410	.386	.391
65.0	.234	.235	.257	.360	.400	.386	.390
75.0	.250	.254	.276	.354	.389	.390	.389
85.0	.261	.249	.281	.383	.426	.415	.425
95.0	.295	.283	.302	.407	.435	.437	.455
105.0	.275	.281	.292	.362	.395	.396	.400
115.0	.295	.288	.310	.338	.365	.366	.362
125.0	.298	.302	.324	.342	.369	.361	.368
135.0	.314	.320	.344	.372	.383	.385	.385
145.0	.310	.327	.348	.350	.385	.381	.383
155.0	.321	.320	.351	.353	.373	.380	.374
165.0	.310	.348	.338	.348	.369	.372	.373
175.0	.310	.357	.346	.353	.365	.374	.370
185.0	.376	.390	.377	.388	.414	.417	.411
195.0	.451	.465	.444	.473	.469	.480	.478
205.0	.377	.379	.383	.379	.391	.387	.403
215.0	.354	.348	.351	.347	.366	.369	.379
225.0	.340	.348	.351	.347	.366	.369	.379

TENEURS EN EAU P3

Z	24/ 9/84	1/10/84	2/11/84	15/11/84	2/12/84	22/ 1/85	5/ 4/85	9/ 5/85
5.0	.564	.467	.366	.229	.200	.174	.145	.169
15.0	.556	.539	.443	.281	.251	.240	.172	.176
25.0	.517	.511	.406	.313	.279	.269	.238	.204
35.0	.542	.527	.461	.383	.329	.313	.297	.299
45.0	.418	.415	.359	.307	.252	.223	.231	.256
55.0	.391	.382	.348	.297	.267	.232	.213	.202
65.0	.390	.379	.379	.327	.302	.272	.235	.222
75.0	.389	.387	.376	.350	.330	.285	.256	.246
85.0	.425	.415	.403	.411	.369	.309	.269	.242
95.0	.455	.429	.437	.437	.379	.320	.291	.286
105.0	.400	.420	.394	.384	.374	.327	.297	.283
115.0	.362	.362	.361	.358	.355	.339	.298	.284
125.0	.368	.359	.359	.354	.358	.333	.312	.310
135.0	.385	.370	.381	.374	.361	.362	.322	.321
145.0	.383	.357	.359	.358	.365	.368	.322	.321
155.0	.374	.370	.358	.359	.366	.355	.322	.324
165.0	.373	.359	.368	.372	.361	.354	.340	.335
175.0	.370	.369	.377	.362	.365	.359	.368	.368
185.0	.411	.409	.411	.411	.417	.403	.418	.435
195.0	.478	.478	.480	.463	.469	.451	.472	.472
205.0	.403	.394	.398	.388	.392	.388	.391	.377
215.0	.379	.362	.368	.377	.369	.361	.372	.365
225.0	.379	.362	.368	.377	.369	.361	.359	.365

TENEURS EN EAU P3

Z	16/ 5/84	11/ 6/84	22/ 6/84	29/ 6/84	16/ 7/84	24/ 7/84	29/ 7/84	3/ 8/84
5.0	.173	.268	.316	.365	.398	.461	.402	.574
15.0	.208	.373	.403	.466	.515	.549	.496	.561
25.0	.248	.349	.379	.457	.516	.520	.470	.516
35.0	.315	.349	.399	.507	.530	.527	.499	.535
45.0	.229	.244	.283	.395	.403	.440	.403	.419
55.0	.207	.207	.241	.355	.389	.396	.386	.410
65.0	.234	.235	.257	.360	.397	.400	.385	.400
75.0	.250	.254	.276	.354	.394	.396	.376	.389
85.0	.261	.249	.281	.383	.410	.433	.406	.426
95.0	.295	.283	.302	.407	.422	.444	.410	.435
105.0	.275	.281	.292	.362	.385	.399	.366	.395
115.0	.295	.288	.310	.338	.359	.362	.357	.365
125.0	.298	.302	.324	.342	.354	.369	.350	.369
135.0	.314	.320	.344	.372	.380	.399	.379	.383
145.0	.310	.327	.348	.350	.370	.392	.358	.385
155.0	.321	.320	.351	.353	.365	.385	.366	.373
165.0	.310	.348	.338	.348	.359	.379	.355	.369
175.0	.310	.357	.346	.353	.361	.369	.357	.365
185.0	.376	.390	.377	.388	.395	.405	.385	.414
195.0	.451	.465	.444	.473	.451	.474	.463	.469
205.0	.377	.379	.383	.379	.365	.383	.379	.391
215.0	.354	.348	.351	.347	.353	.379	.348	.366
225.0	.340	.348	.351	.347	.353	.379	.348	.366

TENEURS EN EAU P3

Z	30/10/84	2/11/84	8/11/84
5.0	.259	.366	.273
15.0	.322	.443	.341
25.0	.356	.406	.363
35.0	.424	.461	.427
45.0	.330	.359	.329
55.0	.321	.348	.326
65.0	.360	.379	.344
75.0	.373	.376	.373
85.0	.406	.403	.417
95.0	.432	.437	.425
105.0	.385	.394	.380
115.0	.354	.361	.348
125.0	.361	.359	.346
135.0	.369	.381	.369
145.0	.359	.359	.374
155.0	.359	.358	.362
165.0	.353	.368	.353
175.0	.365	.377	.366
185.0	.410	.411	.422
195.0	.462	.480	.455
205.0	.406	.398	.387
215.0	.374	.368	.366
225.0	.374	.368	.366

P1 16/ 5/84

Z(cm)	TETA	STOCK	Z(cm)
5.0	.046	2.3	5.0
		5.7	10.0
15.0	.089	10.1	15.0
		14.5	20.0
25.0	.106	19.8	25.0
		25.1	30.0
35.0	.188	34.6	35.0
		44.0	40.0
45.0	.221	55.0	45.0
		66.1	50.0
55.0	.185	75.3	55.0
		84.6	60.0
65.0	.140	91.6	65.0
		98.6	70.0
75.0	.140	105.6	75.0
		112.6	80.0
85.0	.158	120.4	85.0
		128.3	90.0
95.0	.160	136.3	95.0
		144.3	100.0
105.0	.168	152.7	105.0
		161.1	110.0
115.0	.176	169.9	115.0
		178.7	120.0
125.0	.169	187.1	125.0
		195.6	130.0
135.0	.180	204.5	135.0
		213.5	140.0
145.0	.192	223.1	145.0
		232.7	150.0
155.0	.197	242.6	155.0
		252.4	160.0
165.0	.195	262.2	165.0
		271.9	170.0
175.0	.197	281.8	175.0
		291.7	180.0
185.0	.200	301.7	185.0
		311.7	190.0
195.0	.211	322.3	195.0
		332.8	200.0
205.0	.229	344.3	205.0
		355.7	210.0
215.0	.236	367.5	215.0
		379.3	220.0
225.0	.240	391.3	225.0
		403.4	230.0
235.0	.250	415.9	235.0
		428.3	240.0
245.0	.269	441.8	245.0
		455.2	250.0
255.0	.283	469.4	255.0
		483.5	260.0
265.0	.290	498.1	265.0
		512.6	270.0
275.0	.290	527.1	275.0
		541.6	280.0
285.0	.300	550.6	285.0

P1 11/ 6/84

Z(cm)	TETA	STOCK	Z(cm)
5.0	.163	8.2	5.0
		15.9	10.0
15.0	.146	23.2	15.0
		30.6	20.0
25.0	.111	36.1	25.0
		41.6	30.0
35.0	.195	51.4	35.0
		61.1	40.0
45.0	.218	72.0	45.0
		82.9	50.0
55.0	.182	92.0	55.0
		101.1	60.0
65.0	.134	107.7	65.0
		114.4	70.0
75.0	.133	121.1	75.0
		127.7	80.0
85.0	.149	135.2	85.0
		142.6	90.0
95.0	.163	150.8	95.0
		159.0	100.0
105.0	.172	167.5	105.0
		176.1	110.0
115.0	.173	184.8	115.0
		193.5	120.0
125.0	.170	202.0	125.0
		210.5	130.0
135.0	.176	219.3	135.0
		228.0	140.0
145.0	.194	237.8	145.0
		247.5	150.0
155.0	.191	257.0	155.0
		266.6	160.0
165.0	.195	276.3	165.0
		286.1	170.0
175.0	.195	295.8	175.0
		305.6	180.0
185.0	.204	315.8	185.0
		326.0	190.0
195.0	.218	336.9	195.0
		347.8	200.0
205.0	.228	359.2	205.0
		370.6	210.0
215.0	.234	382.3	215.0
		394.0	220.0
225.0	.238	405.9	225.0
		417.8	230.0
235.0	.251	430.3	235.0
		442.9	240.0
245.0	.266	456.2	245.0
		469.5	250.0
255.0	.279	483.5	255.0
		497.4	260.0
265.0	.290	511.9	265.0
		526.4	270.0
275.0	.296	541.2	275.0
		556.0	280.0
285.0	.306	571.3	285.0

	P1	22/ 6/84

Z(cm)	TETA	STOCK	Z(cm)
5.0	.190	9.5	5.0
		19.3	10.0
15.0	.203	29.5	15.0
		39.7	20.0
25.0	.159	47.6	25.0
		55.6	30.0
35.0	.210	66.1	35.0
		76.6	40.0
45.0	.223	87.7	45.0
		98.9	50.0
55.0	.179	107.8	55.0
		116.8	60.0
65.0	.138	123.7	65.0
		130.5	70.0
75.0	.131	137.1	75.0
		143.6	80.0
85.0	.146	150.9	85.0
		158.2	90.0
95.0	.154	165.9	95.0
		173.6	100.0
105.0	.169	182.1	105.0
		190.5	110.0
115.0	.173	199.2	115.0
		207.9	120.0
125.0	.171	216.4	125.0
		225.0	130.0
135.0	.176	233.8	135.0
		242.5	140.0
145.0	.191	252.1	145.0
		261.7	150.0
155.0	.192	271.3	155.0
		280.9	160.0
165.0	.195	290.6	165.0
		300.4	170.0
175.0	.194	310.1	175.0
		319.8	180.0
185.0	.200	329.8	185.0
		339.7	190.0
195.0	.216	350.5	195.0
		361.3	200.0
205.0	.230	372.8	205.0
		384.3	210.0
215.0	.239	396.2	215.0
		408.1	220.0
225.0	.243	420.3	225.0
		432.5	230.0
235.0	.250	445.0	235.0
		457.5	240.0
245.0	.267	470.8	245.0
		484.2	250.0
255.0	.286	498.5	255.0
		512.8	260.0
265.0	.297	527.6	265.0
		542.5	270.0
275.0	.299	557.4	275.0
		572.4	280.0
285.0	.303	587.6	285.0

	P1	29/ 6/84

Z(cm)	TETA	STOCK	Z(cm)
5.0	.264	13.2	5.0
		26.6	10.0
15.0	.274	40.3	15.0
		54.0	20.0
25.0	.276	67.8	25.0
		81.7	30.0
35.0	.330	98.2	35.0
		114.7	40.0
45.0	.338	131.6	45.0
		148.5	50.0
55.0	.254	161.1	55.0
		173.8	60.0
65.0	.174	182.5	65.0
		191.2	70.0
75.0	.138	198.1	75.0
		205.1	80.0
85.0	.144	212.2	85.0
		219.4	90.0
95.0	.145	226.7	95.0
		234.0	100.0
105.0	.164	242.2	105.0
		250.4	110.0
115.0	.166	258.7	115.0
		267.0	120.0
125.0	.162	275.1	125.0
		283.2	130.0
135.0	.172	291.8	135.0
		300.4	140.0
145.0	.191	310.0	145.0
		319.5	150.0
155.0	.188	328.9	155.0
		338.4	160.0
165.0	.192	348.0	165.0
		357.6	170.0
175.0	.191	367.1	175.0
		376.6	180.0
185.0	.199	386.6	185.0
		396.6	190.0
195.0	.214	407.3	195.0
		418.0	200.0
205.0	.228	429.4	205.0
		440.8	210.0
215.0	.244	453.0	215.0
		465.2	220.0
225.0	.262	478.3	225.0
		491.4	230.0
235.0	.297	506.3	235.0
		521.2	240.0
245.0	.300	536.2	245.0
		551.2	250.0
255.0	.296	566.1	255.0
		580.9	260.0
265.0	.295	595.6	265.0
		610.4	270.0
275.0	.298	625.3	275.0
		640.2	280.0
285.0	.301	654.7	285.0

| | P1 | 16/ 7/84 | | | P1 | 24/ 7/84 | |

Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.282	14.1	5.0	5.0	.297	14.8	5.0
		28.5	10.0			29.9	10.0
15.0	.292	43.0	15.0	15.0	.306	45.2	15.0
		57.6	20.0			60.5	20.0
25.0	.302	72.7	25.0	25.0	.309	76.0	25.0
		87.8	30.0			91.5	30.0
35.0	.357	105.6	35.0	35.0	.369	109.9	35.0
		123.5	40.0			128.4	40.0
45.0	.368	141.9	45.0	45.0	.375	147.1	45.0
		160.3	50.0			165.8	50.0
55.0	.289	174.7	55.0	55.0	.291	180.4	55.0
		189.1	60.0			195.0	60.0
65.0	.224	200.3	65.0	65.0	.215	205.7	65.0
		211.5	70.0			216.5	70.0
75.0	.217	222.4	75.0	75.0	.218	227.4	75.0
		233.2	80.0			238.3	80.0
85.0	.213	243.8	85.0	85.0	.235	250.1	85.0
		254.5	90.0			261.9	90.0
95.0	.183	263.7	95.0	95.0	.263	275.0	95.0
		272.8	100.0			288.2	100.0
105.0	.173	281.5	105.0	105.0	.263	301.3	105.0
		290.1	110.0			314.4	110.0
115.0	.171	298.6	115.0	115.0	.253	327.1	115.0
		307.2	120.0			339.7	120.0
125.0	.166	315.5	125.0	125.0	.209	350.1	125.0
		323.7	130.0			360.6	130.0
135.0	.177	332.6	135.0	135.0	.201	370.6	135.0
		341.5	140.0			380.6	140.0
145.0	.192	351.1	145.0	145.0	.228	392.0	145.0
		360.7	150.0			403.4	150.0
155.0	.191	370.2	155.0	155.0	.257	416.3	155.0
		379.8	160.0			429.2	160.0
165.0	.199	389.8	165.0	165.0	.268	442.6	165.0
		399.7	170.0			456.0	170.0
175.0	.207	410.1	175.0	175.0	.276	469.8	175.0
		420.5	180.0			483.6	180.0
185.0	.234	432.1	185.0	185.0	.282	497.7	185.0
		443.8	190.0			511.8	190.0
195.0	.256	456.6	195.0	195.0	.286	526.0	195.0
		469.5	200.0			540.3	200.0
205.0	.283	483.6	205.0	205.0	.298	555.2	205.0
		497.7	210.0			570.1	210.0
215.0	.292	512.3	215.0	215.0	.296	584.9	215.0
		527.0	220.0			599.7	220.0
225.0	.303	542.1	225.0	225.0	.309	615.1	225.0
		557.2	230.0			630.6	230.0
235.0	.312	572.8	235.0	235.0	.320	646.6	235.0
		588.4	240.0			662.6	240.0
245.0	.305	603.6	245.0	245.0	.312	678.2	245.0
		618.8	250.0			693.8	250.0
255.0	.302	633.9	255.0	255.0	.311	709.3	255.0
		649.0	260.0			724.9	260.0
265.0	.303	664.1	265.0	265.0	.311	740.4	265.0
		679.3	270.0			756.0	270.0
275.0	.299	694.2	275.0	275.0	.309	771.4	275.0
		709.1	280.0			786.9	280.0
285.0	.293	724.1	285.0	285.0	.312	802.5	285.0

| P1 | 3/ 8/84 | | | P1 | 13/ 8/84 | | |

Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.295	14.7	5.0	5.0	.285	14.2	5.0
		29.6	10.0			28.4	10.0
15.0	.298	44.5	15.0	15.0	.283	42.6	15.0
		59.4	20.0			56.7	20.0
25.0	.308	74.8	25.0	25.0	.291	71.3	25.0
		90.1	30.0			85.9	30.0
35.0	.363	108.3	35.0	35.0	.345	103.1	35.0
		126.5	40.0			120.4	40.0
45.0	.379	145.5	45.0	45.0	.357	138.2	45.0
		164.4	50.0			156.1	50.0
55.0	.319	180.4	55.0	55.0	.310	171.6	55.0
		196.3	60.0			187.1	60.0
65.0	.298	211.2	65.0	65.0	.289	201.6	65.0
		226.1	70.0			216.0	70.0
75.0	.294	240.8	75.0	75.0	.292	230.6	75.0
		255.4	80.0			245.2	80.0
85.0	.319	271.4	85.0	85.0	.322	261.4	85.0
		287.4	90.0			277.5	90.0
95.0	.350	304.9	95.0	95.0	.351	295.1	95.0
		322.4	100.0			312.6	100.0
105.0	.349	339.8	105.0	105.0	.355	330.4	105.0
		357.2	110.0			348.1	110.0
115.0	.341	374.3	115.0	115.0	.344	365.3	115.0
		391.4	120.0			382.6	120.0
125.0	.336	408.2	125.0	125.0	.343	399.7	125.0
		425.0	130.0			416.8	130.0
135.0	.339	442.0	135.0	135.0	.345	434.1	135.0
		458.9	140.0			451.3	140.0
145.0	.313	474.5	145.0	145.0	.312	466.9	145.0
		490.2	150.0			482.5	150.0
155.0	.311	505.7	155.0	155.0	.315	498.3	155.0
		521.3	160.0			514.0	160.0
165.0	.303	536.4	165.0	165.0	.307	529.4	165.0
		551.6	170.0			544.7	170.0
175.0	.296	566.4	175.0	175.0	.302	559.8	175.0
		581.2	180.0			574.9	180.0
135.0	.295	596.0	185.0	185.0	.293	589.6	185.0
		610.7	190.0			604.2	190.0
195.0	.290	625.3	195.0	195.0	.293	618.9	195.0
		639.8	200.0			633.6	200.0
205.0	.300	654.8	205.0	205.0	.303	648.7	205.0
		669.8	210.0			663.9	210.0
215.0	.313	685.4	215.0	215.0	.310	679.4	215.0
		701.0	220.0			695.0	220.0
225.0	.317	716.9	225.0	225.0	.318	710.9	225.0
		732.8	230.0			726.8	230.0
235.0	.333	749.4	235.0	235.0	.323	742.9	235.0
		766.1	240.0			759.1	240.0
245.0	.328	782.5	245.0	245.0	.315	774.9	245.0
		798.8	250.0			790.6	250.0
255.0	.312	814.4	255.0	255.0	.309	806.0	255.0
		830.0	260.0			821.5	260.0
265.0	.311	845.5	265.0	265.0	.306	836.8	265.0
		861.1	270.0			852.1	270.0
275.0	.296	875.9	275.0	275.0	.306	867.4	275.0
		890.7	280.0			882.7	280.0
285.0	.307	906.1	285.0	285.0	.305	898.0	285.0

P1	24/ 9/84

Z(cm)	TETA	STOCK	Z(cm)
5.0	.291	14.5	5.0
		29.2	10.0
15.0	.297	44.1	15.0
		58.9	20.0
25.0	.315	74.7	25.0
		90.4	30.0
35.0	.379	109.4	35.0
		128.4	40.0
45.0	.422	149.5	45.0
		170.6	50.0
55.0	.389	190.0	55.0
		209.5	60.0
65.0	.303	224.6	65.0
		239.8	70.0
75.0	.288	254.2	75.0
		268.6	80.0
85.0	.319	284.6	85.0
		300.5	90.0
95.0	.348	317.9	95.0
		335.3	100.0
105.0	.354	353.1	105.0
		370.8	110.0
115.0	.327	387.1	115.0
		403.5	120.0
125.0	.323	419.7	125.0
		435.8	130.0
135.0	.343	453.0	135.0
		470.2	140.0
145.0	.307	485.5	145.0
		500.9	150.0
155.0	.309	516.4	155.0
		531.8	160.0
165.0	.305	547.1	165.0
		562.3	170.0
175.0	.301	577.3	175.0
		592.4	180.0
185.0	.283	606.6	185.0
		620.7	190.0
195.0	.289	635.2	195.0
		649.6	200.0
205.0	.292	664.2	205.0
		678.8	210.0
215.0	.297	693.7	215.0
		708.5	220.0
225.0	.310	724.0	225.0
		739.5	230.0
235.0	.316	755.4	235.0
		771.2	240.0
245.0	.308	786.6	245.0
		802.0	250.0
255.0	.297	816.8	255.0
		831.7	260.0
265.0	.304	846.9	265.0
		862.1	270.0
275.0	.297	877.0	275.0
		891.9	280.0
285.0	.306	907.2	285.0

P1	1/10/84

Z(cm)	TETA	STOCK	Z(cm)
5.0	.237	11.9	5.0
		24.6	10.0
15.0	.272	38.1	15.0
		51.7	20.0
25.0	.303	66.9	25.0
		82.0	30.0
35.0	.363	100.2	35.0
		118.3	40.0
45.0	.384	137.5	45.0
		156.7	50.0
55.0	.334	173.4	55.0
		190.1	60.0
65.0	.300	205.1	65.0
		220.1	70.0
75.0	.296	234.9	75.0
		249.8	80.0
85.0	.326	266.1	85.0
		282.4	90.0
95.0	.364	300.6	95.0
		318.8	100.0
105.0	.358	336.7	105.0
		354.7	110.0
115.0	.346	372.0	115.0
		389.2	120.0
125.0	.333	405.9	125.0
		422.6	130.0
135.0	.344	439.8	135.0
		457.0	140.0
145.0	.315	472.7	145.0
		488.5	150.0
155.0	.315	504.2	155.0
		519.9	160.0
165.0	.307	535.3	165.0
		550.6	170.0
175.0	.302	565.7	175.0
		580.8	180.0
185.0	.296	595.6	185.0
		610.4	190.0
195.0	.297	625.3	195.0
		640.1	200.0
205.0	.296	654.9	205.0
		669.7	210.0
215.0	.302	684.8	215.0
		699.9	220.0
225.0	.310	715.4	225.0
		730.8	230.0
235.0	.320	746.8	235.0
		762.8	240.0
245.0	.315	778.6	245.0
		794.3	250.0
255.0	.307	809.7	255.0
		825.0	260.0
265.0	.305	840.3	265.0
		855.5	270.0
275.0	.305	870.7	275.0
		885.9	280.0
285.0	.305	901.2	285.0

P1	15/10/84			P1	30/10/84		

Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.189	9.4	5.0	5.0	.105	5.2	5.0
		19.9	10.0			11.2	10.0
15.0	.229	31.3	15.0	15.0	.135	18.0	15.0
		42.7	20.0			24.7	20.0
25.0	.255	55.5	25.0	25.0	.162	32.8	25.0
		68.3	30.0			40.9	30.0
35.0	.330	84.8	35.0	35.0	.268	54.3	35.0
		101.3	40.0			67.7	40.0
45.0	.347	118.7	45.0	45.0	.285	81.9	45.0
		136.0	50.0			96.2	50.0
55.0	.283	150.2	55.0	55.0	.255	108.9	55.0
		164.3	60.0			121.6	60.0
65.0	.233	176.0	65.0	65.0	.215	132.4	65.0
		187.6	70.0			143.2	70.0
75.0	.257	200.5	75.0	75.0	.236	155.0	75.0
		213.3	80.0			166.8	80.0
85.0	.312	228.9	85.0	85.0	.274	180.5	85.0
		244.5	90.0			194.2	90.0
95.0	.345	261.8	95.0	95.0	.317	210.1	95.0
		279.0	100.0			225.9	100.0
105.0	.340	296.0	105.0	105.0	.348	243.3	105.0
		313.0	110.0			260.7	110.0
115.0	.325	329.2	115.0	115.0	.337	277.6	115.0
		345.5	120.0			294.5	120.0
125.0	.322	361.6	125.0	125.0	.335	311.2	125.0
		377.7	130.0			328.0	130.0
135.0	.333	394.4	135.0	135.0	.336	344.7	135.0
		411.0	140.0			361.5	140.0
145.0	.302	426.1	145.0	145.0	.308	376.9	145.0
		441.2	150.0			392.3	150.0
155.0	.307	456.5	155.0	155.0	.313	408.0	155.0
		471.9	160.0			423.7	160.0
165.0	.296	486.7	165.0	165.0	.306	439.0	165.0
		501.5	170.0			454.2	170.0
175.0	.292	516.0	175.0	175.0	.297	469.1	175.0
		530.6	180.0			483.9	180.0
185.0	.289	545.0	185.0	185.0	.290	498.4	185.0
		559.5	190.0			513.0	190.0
195.0	.285	573.7	195.0	195.0	.296	527.8	195.0
		588.0	200.0			542.5	200.0
205.0	.291	602.5	205.0	205.0	.295	557.3	205.0
		617.1	210.0			572.0	210.0
215.0	.292	631.7	215.0	215.0	.299	586.9	215.0
		646.2	220.0			601.9	220.0
225.0	.300	661.3	225.0	225.0	.311	617.4	225.0
		676.3	230.0			633.0	230.0
235.0	.310	691.8	235.0	235.0	.318	648.9	235.0
		707.3	240.0			664.8	240.0
245.0	.299	722.3	245.0	245.0	.307	680.1	245.0
		737.2	250.0			695.5	250.0
255.0	.302	752.3	255.0	255.0	.303	710.6	255.0
		767.4	260.0			725.8	260.0
265.0	.299	782.4	265.0	265.0	.300	740.8	265.0
		797.3	270.0			755.8	270.0
275.0	.296	812.1	275.0	275.0	.302	770.9	275.0
		827.0	280.0			786.0	280.0
285.0	.297	841.8	285.0	285.0	.302	801.1	285.0

P1	2/11/84			P1	8/11/84	

Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.209	10.5	5.0	5.0	.153	7.7	5.0
		20.2	10.0			15.4	10.0
15.0	.178	29.0	15.0	15.0	.158	23.3	15.0
		37.9	20.0			31.2	20.0
25.0	.164	46.1	25.0	25.0	.155	39.0	25.0
		54.3	30.0			46.8	30.0
35.0	.253	66.9	35.0	35.0	.242	58.9	35.0
		79.6	40.0			71.0	40.0
45.0	.274	93.3	45.0	45.0	.260	84.0	45.0
		107.0	50.0			97.0	50.0
55.0	.252	119.6	55.0	55.0	.242	109.1	55.0
		132.2	60.0			121.2	60.0
65.0	.215	142.9	65.0	65.0	.215	132.0	65.0
		153.7	70.0			142.8	70.0
75.0	.227	165.1	75.0	75.0	.231	154.3	75.0
		176.4	80.0			165.8	80.0
85.0	.274	190.1	85.0	85.0	.270	179.3	85.0
		203.8	90.0			192.8	90.0
95.0	.322	220.0	95.0	95.0	.318	208.7	95.0
		236.1	100.0			224.6	100.0
105.0	.341	253.1	105.0	105.0	.337	241.5	105.0
		270.2	110.0			258.3	110.0
115.0	.335	286.9	115.0	115.0	.329	274.8	115.0
		303.7	120.0			291.2	120.0
125.0	.332	320.3	125.0	125.0	.334	307.9	125.0
		336.9	130.0			324.6	130.0
135.0	.343	354.0	135.0	135.0	.343	341.7	135.0
		371.1	140.0			358.9	140.0
145.0	.317	387.0	145.0	145.0	.312	374.5	145.0
		402.8	150.0			390.1	150.0
155.0	.309	418.3	155.0	155.0	.310	405.6	155.0
		433.7	160.0			421.1	160.0
165.0	.304	448.9	165.0	165.0	.305	436.4	165.0
		464.1	170.0			451.6	170.0
175.0	.297	479.0	175.0	175.0	.299	466.5	175.0
		493.8	180.0			481.5	180.0
185.0	.292	508.4	185.0	185.0	.292	496.0	185.0
		523.0	190.0			510.6	190.0
195.0	.293	537.7	195.0	195.0	.294	525.3	195.0
		552.3	200.0			540.0	200.0
205.0	.295	567.1	205.0	205.0	.297	554.8	205.0
		581.8	210.0			569.7	210.0
215.0	.299	596.7	215.0	215.0	.305	584.9	215.0
		611.7	220.0			600.2	220.0
225.0	.309	627.1	225.0	225.0	.310	615.7	225.0
		642.6	230.0			631.2	230.0
235.0	.310	658.1	235.0	235.0	.315	647.0	235.0
		673.6	240.0			662.8	240.0
245.0	.309	689.1	245.0	245.0	.307	678.1	245.0
		704.5	250.0			693.5	250.0
255.0	.302	719.6	255.0	255.0	.300	708.5	255.0
		734.7	260.0			723.5	260.0
265.0	.302	749.8	265.0	265.0	.305	738.7	265.0
		764.9	270.0			753.9	270.0
275.0	.297	779.8	275.0	275.0	.307	769.3	275.0
		794.7	280.0			784.6	280.0
285.0	.303	809.8	285.0	285.0	.300	799.6	285.0

P1	2/12/84			P1	22/ 1/85	

Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.081	4.1	5.0	5.0	.067	3.3	5.0
		8.8	10.0			7.4	10.0
15.0	.110	14.3	15.0	15.0	.094	12.1	15.0
		19.8	20.0			16.8	20.0
25.0	.115	25.5	25.0	25.0	.110	22.3	25.0
		31.2	30.0			27.8	30.0
35.0	.210	41.7	35.0	35.0	.206	38.1	35.0
		52.2	40.0			48.4	40.0
45.0	.221	63.3	45.0	45.0	.215	59.1	45.0
		74.4	50.0			69.9	50.0
55.0	.185	83.6	55.0	55.0	.182	78.9	55.0
		92.8	60.0			88.0	60.0
65.0	.148	100.3	65.0	65.0	.136	94.8	65.0
		107.7	70.0			101.6	70.0
75.0	.172	116.3	75.0	75.0	.142	108.7	75.0
		124.9	80.0			115.9	80.0
85.0	.225	136.1	85.0	85.0	.163	124.0	85.0
		147.3	90.0			132.2	90.0
95.0	.277	161.2	95.0	95.0	.176	141.0	95.0
		175.0	100.0			149.7	100.0
105.0	.298	189.9	105.0	105.0	.214	160.4	105.0
		204.8	110.0			171.1	110.0
115.0	.295	219.6	115.0	115.0	.231	182.7	115.0
		234.3	120.0			194.2	120.0
125.0	.299	249.2	125.0	125.0	.252	206.8	125.0
		264.2	130.0			219.4	130.0
135.0	.321	280.2	135.0	135.0	.279	233.3	135.0
		296.3	140.0			247.3	140.0
145.0	.310	311.8	145.0	145.0	.272	260.8	145.0
		327.3	150.0			274.4	150.0
155.0	.313	343.0	155.0	155.0	.274	288.2	155.0
		358.7	160.0			301.9	160.0
165.0	.305	373.9	165.0	165.0	.272	315.5	165.0
		389.2	170.0			329.1	170.0
175.0	.300	404.2	175.0	175.0	.280	343.1	175.0
		419.2	180.0			357.1	180.0
185.0	.291	433.7	185.0	185.0	.283	371.3	185.0
		448.3	190.0			385.4	190.0
195.0	.296	463.1	195.0	195.0	.288	399.8	195.0
		477.9	200.0			414.2	200.0
205.0	.300	492.9	205.0	205.0	.299	429.2	205.0
		507.9	210.0			444.1	210.0
215.0	.302	523.0	215.0	215.0	.307	459.5	215.0
		538.1	220.0			474.9	220.0
225.0	.312	553.7	225.0	225.0	.316	490.7	225.0
		569.3	230.0			506.4	230.0
235.0	.315	585.1	235.0	235.0	.315	522.2	235.0
		600.8	240.0			538.0	240.0
245.0	.308	616.2	245.0	245.0	.305	553.2	245.0
		631.6	250.0			568.4	250.0
255.0	.309	647.1	255.0	255.0	.303	583.6	255.0
		662.5	260.0			598.7	260.0
265.0	.302	677.6	265.0	265.0	.300	613.7	265.0
		692.7	270.0			628.7	270.0
275.0	.302	707.8	275.0	275.0	.303	643.8	275.0
		722.9	280.0			658.9	280.0
285.0	.302	738.0	285.0	285.0	.306	674.2	285.0

P1 4/ 4/85

Z(cm)	TETA	STOCK	Z(cm)
5.0	.026	1.3	5.0
		4.1	10.0
15.0	.085	8.3	15.0
		12.6	20.0
25.0	.105	17.8	25.0
		23.1	30.0
35.0	.189	32.5	35.0
		42.0	40.0
45.0	.211	52.6	45.0
		63.1	50.0
55.0	.192	72.7	55.0
		82.3	60.0
65.0	.136	89.1	65.0
		95.9	70.0
75.0	.145	103.1	75.0
		110.4	80.0
85.0	.156	118.2	85.0
		126.0	90.0
95.0	.173	134.6	95.0
		143.2	100.0
105.0	.183	152.4	105.0
		161.6	110.0
115.0	.194	171.3	115.0
		180.9	120.0
125.0	.209	191.4	125.0
		201.8	130.0
135.0	.216	212.6	135.0
		223.5	140.0
145.0	.231	235.0	145.0
		246.5	150.0
155.0	.234	258.2	155.0
		269.9	160.0
165.0	.241	282.0	165.0
		294.0	170.0
175.0	.248	306.4	175.0
		318.8	180.0
185.0	.260	331.8	185.0
		344.9	190.0
195.0	.272	358.4	195.0
		372.0	200.0
205.0	.275	385.8	205.0
		399.5	210.0
215.0	.273	413.2	215.0
		426.8	220.0
225.0	.267	440.2	225.0
		453.5	230.0
235.0	.267	466.9	235.0
		480.3	240.0
245.0	.271	493.8	245.0
		507.4	250.0
255.0	.295	522.1	255.0
		536.8	260.0
265.0	.303	552.0	265.0
		567.1	270.0
275.0	.305	582.3	275.0
		597.6	280.0
285.0	.311	613.1	285.0

P1 9/ 5/85

Z(cm)	TETA	STOCK	Z(cm)
5.0	.054	2.7	5.0
		6.1	10.0
15.0	.085	10.4	15.0
		14.6	20.0
25.0	.097	19.5	25.0
		24.4	30.0
35.0	.192	34.0	35.0
		43.6	40.0
45.0	.213	54.2	45.0
		64.9	50.0
55.0	.177	73.7	55.0
		82.6	60.0
65.0	.138	89.5	65.0
		96.4	70.0
75.0	.131	103.0	75.0
		109.6	80.0
85.0	.146	116.9	85.0
		124.2	90.0
95.0	.159	132.1	95.0
		140.0	100.0
105.0	.168	148.4	105.0
		156.8	110.0
115.0	.174	165.5	115.0
		174.2	120.0
125.0	.175	183.0	125.0
		191.7	130.0
135.0	.178	200.6	135.0
		209.5	140.0
145.0	.194	219.2	145.0
		228.9	150.0
155.0	.204	239.1	155.0
		249.3	160.0
165.0	.210	259.8	165.0
		270.4	170.0
175.0	.226	281.6	175.0
		292.9	180.0
185.0	.234	304.6	185.0
		316.3	190.0
195.0	.244	328.5	195.0
		340.7	200.0
205.0	.254	353.4	205.0
		366.1	210.0
215.0	.255	378.9	215.0
		391.6	220.0
225.0	.257	404.5	225.0
		417.4	230.0
235.0	.261	430.4	235.0
		443.5	240.0
245.0	.264	456.7	245.0
		469.9	250.0
255.0	.279	483.8	255.0
		497.8	260.0
265.0	.291	512.3	265.0
		526.9	270.0
275.0	.290	541.4	275.0
		555.9	280.0
285.0	.301	570.9	285.0

P2	16/ 5/84

Z(cm)	TETA	STOCK	Z(cm)
5.0	.220	11.0	5.0
		22.9	10.0
15.0	.255	35.7	15.0
		48.4	20.0
25.0	.288	62.8	25.0
		77.2	30.0
35.0	.245	89.5	35.0
		101.8	40.0
45.0	.173	110.4	45.0
		119.1	50.0
55.0	.200	129.1	55.0
		139.1	60.0
65.0	.266	152.4	65.0
		165.7	70.0
75.0	.279	179.6	75.0
		193.6	80.0
85.0	.277	207.4	85.0
		221.2	90.0
95.0	.287	235.6	95.0
		250.0	100.0
105.0	.281	264.0	105.0
		278.1	110.0
115.0	.246	290.3	115.0
		302.6	120.0
125.0	.266	315.9	125.0
		329.2	130.0
135.0	.282	343.3	135.0
		357.4	140.0
145.0	.302	372.5	145.0
		387.7	150.0
155.0	.308	403.1	155.0
		418.5	160.0
165.0	.314	434.2	165.0
		449.8	170.0
175.0	.314	465.5	175.0
		481.2	180.0
185.0	.306	496.5	185.0

P2	11/ 6/84

Z(cm)	TETA	STOCK	Z(cm)
5.0	.228	11.4	5.0
		24.9	10.0
15.0	.313	40.5	15.0
		56.2	20.0
25.0	.322	72.3	25.0
		88.4	30.0
35.0	.260	101.4	35.0
		114.4	40.0
45.0	.186	123.7	45.0
		133.0	50.0
55.0	.194	142.7	55.0
		152.4	60.0
65.0	.254	165.1	65.0
		177.7	70.0
75.0	.300	192.7	75.0
		207.7	80.0
85.0	.279	221.7	85.0
		235.6	90.0
95.0	.288	250.0	95.0
		264.5	100.0
105.0	.285	278.7	105.0
		292.9	110.0
115.0	.250	305.4	115.0
		317.9	120.0
125.0	.268	331.4	125.0
		344.8	130.0
135.0	.289	359.2	135.0
		373.7	140.0
145.0	.309	389.1	145.0
		404.6	150.0
155.0	.306	419.9	155.0
		435.2	160.0
165.0	.316	451.0	165.0
		466.8	170.0
175.0	.351	484.3	175.0
		501.9	180.0
185.0	.351	519.4	185.0

P2	22/ 6/84				P2	29/ 6/84		

Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.258	12.9	5.0	5.0	.294	14.7	5.0
		28.0	10.0			31.1	10.0
15.0	.345	45.2	15.0	15.0	.362	49.2	15.0
		62.5	20.0			67.3	20.0
25.0	.368	80.9	25.0	25.0	.373	86.0	25.0
		99.3	30.0			104.6	30.0
35.0	.313	114.9	35.0	35.0	.326	120.9	35.0
		130.5	40.0			137.2	40.0
45.0	.270	144.0	45.0	45.0	.306	152.5	45.0
		157.5	50.0			157.8	50.0
55.0	.236	169.3	55.0	55.0	.268	181.2	55.0
		181.2	60.0			194.6	60.0
65.0	.266	194.5	65.0	65.0	.295	209.4	65.0
		207.8	70.0			224.2	70.0
75.0	.286	222.1	75.0	75.0	.333	240.8	75.0
		236.3	80.0			257.4	80.0
85.0	.286	250.6	85.0	85.0	.333	274.1	85.0
		264.9	90.0			290.7	90.0
95.0	.285	279.1	95.0	95.0	.332	307.3	95.0
		293.3	100.0			323.9	100.0
105.0	.286	307.6	105.0	105.0	.319	339.9	105.0
		321.9	110.0			355.9	110.0
115.0	.264	335.1	115.0	115.0	.301	370.9	115.0
		348.3	120.0			386.0	120.0
125.0	.274	362.0	125.0	125.0	.310	401.5	125.0
		375.7	130.0			417.0	130.0
135.0	.297	390.5	135.0	135.0	.339	434.0	135.0
		405.3	140.0			450.9	140.0
145.0	.308	420.8	145.0	145.0	.351	468.5	145.0
		436.2	150.0			486.0	150.0
155.0	.301	451.2	155.0	155.0	.327	502.4	155.0
		466.3	160.0			518.8	160.0
165.0	.331	482.8	165.0	165.0	.339	535.7	165.0
		499.4	170.0			552.6	170.0
175.0	.347	516.7	175.0	175.0	.355	570.4	175.0
		534.0	180.0			588.1	180.0
185.0	.347	551.4	185.0	185.0	.355	605.8	185.0

P2	16/ 7/84			P2	24/ 7/84	

Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.311	15.5	5.0	5.0	.321	16.0	5.0
		32.8	10.0			33.8	10.0
15.0	.379	51.8	15.0	15.0	.390	53.3	15.0
		70.7	20.0			72.9	20.0
25.0	.395	90.5	25.0	25.0	.415	93.6	25.0
		110.2	30.0			114.3	30.0
35.0	.351	127.8	35.0	35.0	.363	132.4	35.0
		145.4	40.0			150.6	40.0
45.0	.325	161.6	45.0	45.0	.354	168.3	45.0
		177.9	50.0			186.0	50.0
55.0	.318	193.8	55.0	55.0	.341	203.0	55.0
		209.7	60.0			220.1	60.0
65.0	.336	226.5	65.0	65.0	.340	237.0	65.0
		243.3	70.0			254.0	70.0
75.0	.355	261.0	75.0	75.0	.366	272.3	75.0
		278.8	80.0			290.6	80.0
85.0	.360	296.8	85.0	85.0	.367	308.9	85.0
		314.8	90.0			327.3	90.0
95.0	.349	332.3	95.0	95.0	.354	345.0	95.0
		349.7	100.0			362.7	100.0
105.0	.339	366.7	105.0	105.0	.345	380.0	105.0
		383.6	110.0			397.2	110.0
115.0	.304	398.8	115.0	115.0	.325	413.5	115.0
		413.9	120.0			429.7	120.0
125.0	.319	429.9	125.0	125.0	.330	446.2	125.0
		445.9	130.0			462.7	130.0
135.0	.348	463.3	135.0	135.0	.360	480.7	135.0
		480.7	140.0			498.7	140.0
145.0	.346	497.9	145.0	145.0	.364	516.9	145.0
		515.2	150.0			535.1	150.0
155.0	.349	532.7	155.0	155.0	.350	552.6	155.0
		550.1	160.0			570.1	160.0
165.0	.343	567.3	165.0	165.0	.356	587.9	165.0
		584.4	170.0			605.7	170.0
175.0	.359	602.4	175.0	175.0	.364	623.9	175.0
		620.3	180.0			642.1	180.0
185.0	.359	638.3	185.0	185.0	.364	660.2	185.0

P2	29/ 7/84				P2	3/ 8/84	
Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.272	13.6	5.0	5.0	.371	18.6	5.0
		29.3	10.0			37.9	10.0
15.0	.357	47.2	15.0	15.0	.402	58.0	15.0
		65.0	20.0			78.1	20.0
25.0	.386	84.4	25.0	25.0	.412	98.7	25.0
		103.7	30.0			119.3	30.0
35.0	.343	120.8	35.0	35.0	.370	137.8	35.0
		138.0	40.0			156.2	40.0
45.0	.331	154.5	45.0	45.0	.364	174.4	45.0
		171.1	50.0			192.6	50.0
55.0	.315	186.9	55.0	55.0	.337	209.5	55.0
		202.6	60.0			226.3	60.0
65.0	.338	219.5	65.0	65.0	.353	244.0	65.0
		236.4	70.0			261.6	70.0
75.0	.354	254.1	75.0	75.0	.365	279.9	75.0
		271.8	80.0			298.1	80.0
85.0	.362	289.9	85.0	85.0	.367	316.4	85.0
		308.0	90.0			334.8	90.0
95.0	.345	325.3	95.0	95.0	.356	352.6	95.0
		342.6	100.0			370.4	100.0
105.0	.329	359.0	105.0	105.0	.349	387.8	105.0
		375.5	110.0			405.3	110.0
115.0	.313	391.1	115.0	115.0	.323	421.4	115.0
		406.7	120.0			437.6	120.0
125.0	.323	422.9	125.0	125.0	.325	453.8	125.0
		439.0	130.0			470.1	130.0
135.0	.341	456.0	135.0	135.0	.349	487.5	135.0
		473.1	140.0			505.0	140.0
145.0	.356	490.9	145.0	145.0	.365	523.2	145.0
		508.7	150.0			541.5	150.0
155.0	.332	525.3	155.0	155.0	.351	559.0	155.0
		541.9	160.0			576.6	160.0
165.0	.346	559.1	165.0	165.0	.346	593.9	165.0
		576.4	170.0			611.1	170.0
175.0	.363	594.5	175.0	175.0	.360	629.2	175.0
		612.7	180.0			647.2	180.0
185.0	.363	630.8	185.0	185.0	.360	665.2	185.0

P2	13/ 8/84			P2	24/ 9/84		
Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.375	18.8	5.0	5.0	.369	18.5	5.0
		38.2	10.0			37.8	10.0
15.0	.403	58.4	15.0	15.0	.404	58.0	15.0
		78.5	20.0			78.2	20.0
25.0	.417	99.4	25.0	25.0	.418	99.0	25.0
		120.2	30.0			119.9	30.0
35.0	.369	138.7	35.0	35.0	.362	138.0	35.0
		157.1	40.0			156.1	40.0
45.0	.371	175.7	45.0	45.0	.349	173.6	45.0
		194.2	50.0			191.0	50.0
55.0	.338	211.1	55.0	55.0	.337	207.9	55.0
		228.0	60.0			224.7	60.0
65.0	.353	245.6	65.0	65.0	.346	242.0	65.0
		263.3	70.0			259.3	70.0
75.0	.368	281.7	75.0	75.0	.364	277.5	75.0
		300.1	80.0			295.7	80.0
85.0	.371	318.6	85.0	85.0	.374	314.4	85.0
		337.1	90.0			333.2	90.0
95.0	.355	354.9	95.0	95.0	.346	350.5	95.0
		372.6	100.0			367.8	100.0
105.0	.338	389.5	105.0	105.0	.345	385.1	105.0
		406.4	110.0			402.3	110.0
115.0	.327	422.8	115.0	115.0	.322	418.4	115.0
		439.1	120.0			434.5	120.0
125.0	.340	456.1	125.0	125.0	.330	451.0	125.0
		473.1	130.0			467.5	130.0
135.0	.368	491.5	135.0	135.0	.357	485.3	135.0
		509.9	140.0			503.2	140.0
145.0	.368	528.3	145.0	145.0	.358	521.1	145.0
		546.8	150.0			539.0	150.0
155.0	.355	564.5	155.0	155.0	.338	555.8	155.0
		582.2	160.0			572.7	160.0
165.0	.356	600.0	165.0	165.0	.338	589.6	165.0
		617.8	170.0			606.5	170.0
175.0	.367	636.1	175.0	175.0	.358	624.4	175.0
		654.5	180.0			642.3	180.0
185.0	.367	672.9	185.0	185.0	.358	660.2	185.0

| F2 | 1/10/84 | | | F2 | 15/10/84 | | |

Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.355	17.7	5.0	5.0	.350	17.5	5.0
		36.5	10.0			36.1	10.0
15.0	.397	56.4	15.0	15.0	.393	55.7	15.0
		76.3	20.0			75.4	20.0
25.0	.404	96.4	25.0	25.0	.406	95.7	25.0
		116.6	30.0			116.0	30.0
35.0	.362	134.7	35.0	35.0	.362	134.0	35.0
		152.9	40.0			152.1	40.0
45.0	.355	170.6	45.0	45.0	.358	170.0	45.0
		188.4	50.0			187.9	50.0
55.0	.329	204.8	55.0	55.0	.330	204.4	55.0
		221.3	60.0			220.9	60.0
65.0	.334	238.0	65.0	65.0	.337	237.8	65.0
		254.7	70.0			254.6	70.0
75.0	.355	272.4	75.0	75.0	.353	272.3	75.0
		290.2	80.0			289.9	80.0
85.0	.356	308.0	85.0	85.0	.358	307.8	85.0
		325.8	90.0			325.7	90.0
95.0	.331	342.3	95.0	95.0	.342	342.8	95.0
		358.9	100.0			359.9	100.0
105.0	.337	375.7	105.0	105.0	.330	376.4	105.0
		392.5	110.0			392.9	110.0
115.0	.313	408.2	115.0	115.0	.310	408.4	115.0
		423.8	120.0			423.9	120.0
125.0	.313	439.4	125.0	125.0	.324	440.1	125.0
		455.1	130.0			456.3	130.0
135.0	.350	472.6	135.0	135.0	.343	473.5	135.0
		490.1	140.0			490.6	140.0
145.0	.350	507.6	145.0	145.0	.340	507.6	145.0
		525.1	150.0			524.6	150.0
155.0	.330	541.6	155.0	155.0	.330	541.1	155.0
		556.0	160.0			557.6	160.0
165.0	.330	574.5	165.0	165.0	.342	574.7	165.0
		591.0	170.0			591.8	170.0
175.0	.344	608.2	175.0	175.0	.356	609.6	175.0
		625.4	180.0			627.4	180.0
185.0	.344	642.7	185.0	185.0	.356	645.1	185.0

P2	30/10/84

P2	2/11/84

Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.276	13.8	5.0	5.0	.309	15.5	5.0
		30.0	10.0			32.5	10.0
15.0	.372	48.6	15.0	15.0	.373	51.2	15.0
		67.1	20.0			69.8	20.0
25.0	.390	86.7	25.0	25.0	.390	89.4	25.0
		106.2	30.0			108.9	30.0
35.0	.350	123.7	35.0	35.0	.356	126.7	35.0
		141.1	40.0			144.5	40.0
45.0	.341	158.2	45.0	45.0	.354	162.2	45.0
		175.2	50.0			179.9	50.0
55.0	.316	191.0	55.0	55.0	.330	196.4	55.0
		206.8	60.0			212.9	60.0
65.0	.344	224.1	65.0	65.0	.336	229.7	65.0
		241.3	70.0			246.4	70.0
75.0	.366	259.6	75.0	75.0	.360	264.4	75.0
		277.9	80.0			282.4	80.0
85.0	.355	295.6	85.0	85.0	.366	300.7	85.0
		313.4	90.0			319.0	90.0
95.0	.345	330.6	95.0	95.0	.344	336.2	95.0
		347.9	100.0			353.4	100.0
105.0	.344	365.1	105.0	105.0	.340	370.3	105.0
		382.3	110.0			387.3	110.0
115.0	.315	398.0	115.0	115.0	.316	403.1	115.0
		413.8	120.0			418.9	120.0
125.0	.322	429.8	125.0	125.0	.319	434.9	125.0
		445.9	130.0			450.9	130.0
135.0	.351	463.5	135.0	135.0	.340	467.9	135.0
		481.0	140.0			484.9	140.0
145.0	.353	498.7	145.0	145.0	.352	502.5	145.0
		516.4	150.0			520.1	150.0
155.0	.343	533.6	155.0	155.0	.332	536.7	155.0
		550.7	160.0			553.3	160.0
165.0	.342	567.8	165.0	165.0	.340	570.3	165.0
		584.9	170.0			587.3	170.0
175.0	.358	602.8	175.0	175.0	.351	604.8	175.0
		620.7	180.0			622.4	180.0
185.0	.358	638.6	185.0	185.0	.351	640.0	185.0

P2	8/11/84

P2	15/11/84

Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.277	13.8	5.0	5.0	.232	11.6	5.0
		29.9	10.0			26.1	10.0
15.0	.366	48.2	15.0	15.0	.348	43.5	15.0
		66.5	20.0			60.9	20.0
25.0	.384	85.7	25.0	25.0	.379	79.8	25.0
		104.9	30.0			98.8	30.0
35.0	.351	122.5	35.0	35.0	.339	115.8	35.0
		140.1	40.0			132.7	40.0
45.0	.344	157.3	45.0	45.0	.322	148.8	45.0
		174.5	50.0			164.9	50.0
55.0	.321	190.6	55.0	55.0	.296	179.8	55.0
		206.6	60.0			194.6	60.0
65.0	.337	223.5	65.0	65.0	.319	210.5	65.0
		240.3	70.0			226.5	70.0
75.0	.364	258.5	75.0	75.0	.354	244.2	75.0
		276.7	80.0			261.9	80.0
85.0	.363	294.8	85.0	85.0	.362	280.0	85.0
		313.0	90.0			298.1	90.0
95.0	.344	330.2	95.0	95.0	.345	315.4	95.0
		347.3	100.0			332.6	100.0
105.0	.341	364.4	105.0	105.0	.331	349.2	105.0
		381.4	110.0			365.7	110.0
115.0	.310	396.9	115.0	115.0	.314	381.4	115.0
		412.4	120.0			397.1	120.0
125.0	.321	428.5	125.0	125.0	.316	412.9	125.0
		444.5	130.0			428.7	130.0
135.0	.346	461.8	135.0	135.0	.340	445.7	135.0
		479.0	140.0			462.7	140.0
145.0	.342	496.1	145.0	145.0	.343	479.9	145.0
		513.2	150.0			497.0	150.0
155.0	.338	530.1	155.0	155.0	.340	514.0	155.0
		547.0	160.0			531.0	160.0
165.0	.326	563.3	165.0	165.0	.340	548.0	165.0
		579.6	170.0			565.0	170.0
175.0	.350	597.1	175.0	175.0	.357	582.8	175.0
		614.6	180.0			600.7	180.0
185.0	.350	632.1	185.0	185.0	.357	618.5	185.0

P2	2/12/84

P2	22/ 1/85

Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.181	9.1	5.0	5.0	.156	7.8	5.0
		21.3	10.0			18.4	10.0
15.0	.308	36.7	15.0	15.0	.269	31.8	15.0
		52.1	20.0			45.3	20.0
25.0	.347	69.5	25.0	25.0	.295	60.0	25.0
		86.8	30.0			74.8	30.0
35.0	.316	102.6	35.0	35.0	.242	86.9	35.0
		118.4	40.0			99.0	40.0
45.0	.283	132.5	45.0	45.0	.190	108.5	45.0
		146.6	50.0			118.0	50.0
55.0	.265	159.9	55.0	55.0	.236	129.8	55.0
		173.2	60.0			141.6	60.0
65.0	.310	188.7	65.0	65.0	.289	156.1	65.0
		204.1	70.0			170.5	70.0
75.0	.331	220.7	75.0	75.0	.298	185.4	75.0
		237.2	80.0			200.3	80.0
85.0	.336	254.0	85.0	85.0	.303	215.5	85.0
		270.8	90.0			230.6	90.0
95.0	.349	288.3	95.0	95.0	.306	245.9	95.0
		305.7	100.0			261.2	100.0
105.0	.344	322.9	105.0	105.0	.308	276.6	105.0
		340.1	110.0			292.0	110.0
115.0	.316	355.9	115.0	115.0	.286	306.3	115.0
		371.7	120.0			320.6	120.0
125.0	.321	387.7	125.0	125.0	.300	335.7	125.0
		403.8	130.0			350.7	130.0
135.0	.343	420.9	135.0	135.0	.336	367.5	135.0
		438.1	140.0			384.3	140.0
145.0	.342	455.2	145.0	145.0	.343	401.5	145.0
		472.3	150.0			418.6	150.0
155.0	.341	489.3	155.0	155.0	.342	435.7	155.0
		506.4	160.0			452.8	160.0
165.0	.347	523.7	165.0	165.0	.330	469.3	165.0
		541.1	170.0			485.8	170.0
175.0	.353	558.7	175.0	175.0	.348	503.2	175.0
		576.4	180.0			520.6	180.0
185.0	.353	594.1	185.0	185.0	.348	538.0	185.0

P2	5/ 4/85

Z(cm)	TETA	STOCK	Z(cm)
5.0	.126	6.3	5.0
		15.6	10.0
15.0	.248	28.0	15.0
		40.4	20.0
25.0	.284	54.6	25.0
		68.8	30.0
35.0	.253	81.4	35.0
		94.0	40.0
45.0	.182	103.1	45.0
		112.3	50.0
55.0	.210	122.8	55.0
		133.3	60.0
65.0	.265	146.5	65.0
		159.8	70.0
75.0	.294	174.5	75.0
		189.2	80.0
85.0	.295	204.0	85.0
		218.7	90.0
95.0	.301	233.8	95.0
		248.8	100.0
105.0	.300	263.8	105.0
		278.8	110.0
115.0	.274	292.5	115.0
		306.2	120.0
125.0	.288	320.6	125.0
		335.0	130.0
135.0	.305	350.2	135.0
		365.5	140.0
145.0	.319	381.4	145.0
		397.4	150.0
155.0	.327	413.8	155.0
		430.2	160.0
165.0	.331	446.7	165.0
		463.2	170.0
175.0	.346	480.5	175.0
		497.8	180.0
185.0	.364	516.0	185.0

P2	9/ 5/85

Z(cm)	TETA	STOCK	Z(cm)
5.0	..130	6.5	5.0
		14.8	10.0
15.0	.204	25.0	15.0
		35.3	20.0
25.0	:301	50.3	25.0
		65.4	30.0
35.0	.269	78.8	35.0
		92.3	40.0
45.0	.185	101.5	45.0
		110.8	50.0
55.0	.182	119.9	55.0
		129.0	60.0
65.0	.237	140.9	65.0
		152.7	70.0
75.0	.287	167.1	75.0
		181.5	80.0
85.0	.296	196.3	85.0
		211.1	90.0
95.0	.292	225.7	95.0
		240.3	100.0
105.0	.299	255.3	105.0
		270.2	110.0
115.0	.252	282.9	115.0
		295.5	120.0
125.0	.274	309.2	125.0
		322.9	130.0
135.0	.286	337.2	135.0
		351.5	140.0
145.0	.300	366.5	145.0
		381.5	150.0
155.0	.304	396.7	155.0
		411.9	160.0
165.0	.324	428.1	165.0
		444.3	170.0
175.0	.321	460.3	175.0
		476.3	180.0
185.0	.327	492.7	185.0

| P3 | | 16/ 5/84 | | P3 | | 11/ 6/84 | |

Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.173	8.7	5.0	5.0	.268	13.4	5.0
		18.2	10.0			29.4	10.0
15.0	.208	28.6	15.0	15.0	.373	48.1	15.0
		39.0	20.0			66.7	20.0
25.0	.248	51.4	25.0	25.0	.349	84.2	25.0
		63.8	30.0			101.6	30.0
35.0	.315	79.6	35.0	35.0	.349	119.1	35.0
		95.3	40.0			136.5	40.0
45.0	.229	106.7	45.0	45.0	.244	148.7	45.0
		118.1	50.0			160.9	50.0
55.0	.207	128.5	55.0	55.0	.207	171.3	55.0
		138.9	60.0			181.6	60.0
65.0	.234	150.5	65.0	65.0	.235	193.4	65.0
		162.2	70.0			205.2	70.0
75.0	.250	174.7	75.0	75.0	.254	217.9	75.0
		187.2	80.0			230.6	80.0
85.0	.261	200.3	85.0	85.0	.249	243.0	85.0
		213.3	90.0			255.5	90.0
95.0	.295	228.1	95.0	95.0	.283	269.6	95.0
		242.8	100.0			283.7	100.0
105.0	.275	256.6	105.0	105.0	.281	297.8	105.0
		270.3	110.0			311.9	110.0
115.0	.295	285.0	115.0	115.0	.288	326.3	115.0
		299.8	120.0			340.7	120.0
125.0	.298	314.7	125.0	125.0	.302	355.8	125.0
		329.6	130.0			370.9	130.0
135.0	.314	345.3	135.0	135.0	.320	386.9	135.0
		361.0	140.0			402.9	140.0
145.0	.310	376.5	145.0	145.0	.327	419.2	145.0
		392.0	150.0			435.5	150.0
155.0	.321	408.1	155.0	155.0	.320	451.5	155.0
		424.2	160.0			467.5	160.0
165.0	.310	439.7	165.0	165.0	.348	484.9	165.0
		455.2	170.0			502.4	170.0
175.0	.310	470.7	175.0	175.0	.357	520.2	175.0
		486.2	180.0			538.0	180.0
185.0	.376	505.0	185.0	185.0	.390	557.5	185.0
		523.8	190.0			577.0	190.0
195.0	.451	546.3	195.0	195.0	.465	600.2	195.0
		568.9	200.0			623.5	200.0
205.0	.377	587.7	205.0	205.0	.379	642.4	205.0
		606.6	210.0			661.3	210.0
215.0	.354	624.3	215.0	215.0	.348	678.7	215.0
		642.0	220.0			696.2	220.0
225.0	.340	653.0	225.0	225.0	.348	713.6	225.0

P3	22/ 6/84			P3	29/ 6/84		

Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.316	15.8	5.0	5.0	.365	18.2	5.0
		33.8	10.0			39.0	10.0
15.0	.403	53.9	15.0	15.0	.466	62.3	15.0
		74.0	20.0			85.6	20.0
25.0	.379	93.0	25.0	25.0	.457	108.4	25.0
		111.9	30.0			131.2	30.0
35.0	.399	131.9	35.0	35.0	.507	156.6	35.0
		151.8	40.0			181.9	40.0
45.0	.283	166.0	45.0	45.0	.395	201.7	45.0
		180.1	50.0			221.4	50.0
55.0	.241	192.2	55.0	55.0	.355	239.2	55.0
		204.3	60.0			256.9	60.0
65.0	.257	217.1	65.0	65.0	.360	274.9	65.0
		230.0	70.0			292.9	70.0
75.0	.276	243.8	75.0	75.0	.354	310.6	75.0
		257.5	80.0			328.3	80.0
85.0	.281	271.6	85.0	85.0	.383	347.4	85.0
		285.7	90.0			366.5	90.0
95.0	.302	300.8	95.0	95.0	.407	386.9	95.0
		315.9	100.0			407.3	100.0
105.0	.292	330.5	105.0	105.0	.362	425.4	105.0
		345.1	110.0			443.5	110.0
115.0	.310	360.6	115.0	115.0	.338	460.4	115.0
		376.1	120.0			477.2	120.0
125.0	.324	392.3	125.0	125.0	.342	494.3	125.0
		408.5	130.0			511.4	130.0
135.0	.344	425.7	135.0	135.0	.372	530.0	135.0
		443.0	140.0			548.6	140.0
145.0	.348	460.4	145.0	145.0	.350	566.1	145.0
		477.8	150.0			583.6	150.0
155.0	.351	495.4	155.0	155.0	.353	601.2	155.0
		512.9	160.0			618.8	160.0
165.0	.338	529.8	165.0	165.0	.348	636.2	165.0
		546.7	170.0			653.7	170.0
175.0	.346	564.0	175.0	175.0	.353	671.3	175.0
		581.3	180.0			688.9	180.0
185.0	.377	600.1	185.0	185.0	.388	708.3	185.0
		619.0	190.0			727.7	190.0
195.0	.444	641.2	195.0	195.0	.473	751.4	195.0
		663.4	200.0			775.0	200.0
205.0	.383	682.5	205.0	205.0	.379	794.0	205.0
		701.7	210.0			812.9	210.0
215.0	.351	719.2	215.0	215.0	.347	830.2	215.0
		736.8	220.0			847.6	220.0
225.0	.351	754.3	225.0	225.0	.347	864.9	225.0

P3	16/ 7/84			P3	24/ 7/84		

Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.398	19.9	5.0	5.0	.461	23.1	5.0
		42.7	10.0			48.3	10.0
15.0	.515	68.4	15.0	15.0	.549	75.8	15.0
		94.2	20.0			103.2	20.0
25.0	.516	120.0	25.0	25.0	.520	129.2	25.0
		145.8	30.0			155.2	30.0
35.0	.530	172.3	35.0	35.0	.527	181.5	35.0
		198.8	40.0			207.9	40.0
45.0	.403	219.0	45.0	45.0	.440	229.9	45.0
		239.1	50.0			251.9	50.0
55.0	.389	258.6	55.0	55.0	.396	271.7	55.0
		278.0	60.0			291.5	60.0
65.0	.397	297.9	65.0	65.0	.400	311.5	65.0
		317.7	70.0			331.5	70.0
75.0	.394	337.4	75.0	75.0	.396	351.3	75.0
		357.1	80.0			371.1	80.0
85.0	.410	377.6	85.0	85.0	.433	392.7	85.0
		398.1	90.0			414.4	90.0
95.0	.422	419.3	95.0	95.0	.444	436.6	95.0
		440.4	100.0			458.8	100.0
105.0	.385	459.6	105.0	105.0	.399	478.8	105.0
		478.9	110.0			498.7	110.0
115.0	.359	496.9	115.0	115.0	.362	516.8	115.0
		514.9	120.0			534.9	120.0
125.0	.354	532.6	125.0	125.0	.369	553.4	125.0
		550.3	130.0			571.8	130.0
135.0	.380	569.3	135.0	135.0	.399	591.8	135.0
		588.2	140.0			611.7	140.0
145.0	.370	606.8	145.0	145.0	.392	631.4	145.0
		625.3	150.0			651.0	150.0
155.0	.365	643.5	155.0	155.0	.385	670.2	155.0
		661.8	160.0			689.5	160.0
165.0	.359	679.7	165.0	165.0	.379	708.4	165.0
		697.7	170.0			727.4	170.0
175.0	.361	715.8	175.0	175.0	.369	745.8	175.0
		733.8	180.0			764.3	180.0
185.0	.395	753.5	185.0	185.0	.405	784.5	185.0
		773.3	190.0			804.7	190.0
195.0	.451	795.8	195.0	195.0	.474	828.4	195.0
		818.4	200.0			852.2	200.0
205.0	.365	836.6	205.0	205.0	.383	871.3	205.0
		854.9	210.0			890.4	210.0
215.0	.353	872.5	215.0	215.0	.379	909.3	215.0
		890.1	220.0			928.3	220.0
225.0	.353	907.8	225.0	225.0	.379	947.2	225.0

P3	29/ 7/84			P3	3/ 8/84		
Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.402	20.1	5.0	5.0	.574	28.7	5.0
		42.5	10.0			57.1	10.0
15.0	.496	67.3	15.0	15.0	.561	85.2	15.0
		92.1	20.0			113.2	20.0
25.0	.470	115.6	25.0	25.0	.516	139.0	25.0
		139.1	30.0			164.9	30.0
35.0	.499	164.1	35.0	35.0	.535	191.6	35.0
		189.1	40.0			218.3	40.0
45.0	.403	209.2	45.0	45.0	.419	239.3	45.0
		229.3	50.0			260.3	50.0
55.0	.386	248.7	55.0	55.0	.410	280.8	55.0
		268.0	60.0			301.2	60.0
65.0	.385	287.2	65.0	65.0	.400	321.2	65.0
		306.5	70.0			341.2	70.0
75.0	.376	325.3	75.0	75.0	.389	360.7	75.0
		344.1	80.0			380.1	80.0
85.0	.406	364.4	85.0	85.0	.426	401.5	85.0
		384.7	90.0			422.8	90.0
95.0	.410	405.2	95.0	95.0	.435	444.5	95.0
		425.7	100.0			466.2	100.0
105.0	.366	444.0	105.0	105.0	.395	486.0	105.0
		462.3	110.0			505.7	110.0
115.0	.357	480.2	115.0	115.0	.365	524.0	115.0
		498.0	120.0			542.2	120.0
125.0	.350	515.5	125.0	125.0	.369	560.7	125.0
		533.0	130.0			579.1	130.0
135.0	.379	551.9	135.0	135.0	.383	598.3	135.0
		570.9	140.0			617.4	140.0
145.0	.358	588.8	145.0	145.0	.385	636.7	145.0
		606.7	150.0			655.9	150.0
155.0	.366	625.0	155.0	155.0	.373	674.6	155.0
		643.3	160.0			693.3	160.0
165.0	.355	661.0	165.0	165.0	.369	711.7	165.0
		678.8	170.0			730.1	170.0
175.0	.357	696.6	175.0	175.0	.365	748.4	175.0
		714.5	180.0			766.6	180.0
185.0	.385	733.8	185.0	185.0	.414	787.3	185.0
		753.0	190.0			808.1	190.0
195.0	.463	776.2	195.0	195.0	.469	831.5	195.0
		799.4	200.0			854.9	200.0
205.0	.379	818.3	205.0	205.0	.391	874.5	205.0
		837.2	210.0			894.0	210.0
215.0	.348	854.6	215.0	215.0	.366	912.3	215.0
		872.1	220.0			930.6	220.0
225.0	.348	889.5	225.0	225.0	.366	949.0	225.0

| P3 | 13/ 8/84 | | | P3 | 24/ 9/84 | | |

Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.566	28.3	5.0	5.0	.564	28.2	5.0
		56.5	10.0			56.2	10.0
15.0	.561	84.5	15.0	15.0	.556	84.0	15.0
		112.5	20.0			111.8	20.0
25.0	.532	139.2	25.0	25.0	.517	137.7	25.0
		165.8	30.0			163.5	30.0
35.0	.551	193.3	35.0	35.0	.542	190.6	35.0
		220.8	40.0			217.7	40.0
45.0	.423	242.0	45.0	45.0	.418	238.6	45.0
		263.2	50.0			259.5	50.0
55.0	.386	282.5	55.0	55.0	.391	279.0	55.0
		301.8	60.0			298.6	60.0
65.0	.386	321.1	65.0	65.0	.390	318.1	65.0
		340.4	70.0			337.6	70.0
75.0	.390	359.9	75.0	75.0	.389	357.1	75.0
		379.4	80.0			376.5	80.0
85.0	.415	400.2	85.0	85.0	.425	397.8	85.0
		421.0	90.0			419.0	90.0
95.0	.437	442.8	95.0	95.0	.455	441.8	95.0
		464.7	100.0			464.5	100.0
105.0	.396	484.5	105.0	105.0	.400	484.6	105.0
		504.3	110.0			504.6	110.0
115.0	.366	522.7	115.0	115.0	.362	522.7	115.0
		541.0	120.0			540.8	120.0
125.0	.361	559.0	125.0	125.0	.368	559.2	125.0
		577.0	130.0			577.6	130.0
135.0	.385	596.3	135.0	135.0	.385	596.8	135.0
		615.6	140.0			616.1	140.0
145.0	.381	634.7	145.0	145.0	.383	635.2	145.0
		653.7	150.0			654.4	150.0
155.0	.380	672.7	155.0	155.0	.374	673.1	155.0
		691.7	160.0			691.8	160.0
165.0	.372	710.3	165.0	165.0	.373	710.5	165.0
		728.9	170.0			729.1	170.0
175.0	.374	747.6	175.0	175.0	.370	747.7	175.0
		766.3	180.0			766.2	180.0
185.0	.417	787.2	185.0	185.0	.411	786.7	185.0
		808.0	190.0			807.3	190.0
195.0	.480	832.0	195.0	195.0	.478	831.2	195.0
		856.0	200.0			855.1	200.0
205.0	.387	875.3	205.0	205.0	.403	875.3	205.0
		894.7	210.0			895.5	210.0
215.0	.369	913.1	215.0	215.0	.379	914.4	215.0
		931.6	220.0			933.3	220.0
225.0	.369	950.0	225.0	225.0	.379	952.3	225.0

| P3 | 1/10/84 | | | | P3 | 15/10/84 | |

Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.467	23.3	5.0	5.0	.438	21.9	5.0
		48.5	10.0			45.8	10.0
15.0	.539	75.4	15.0	15.0	.519	71.8	15.0
		102.3	20.0			97.8	20.0
25.0	.511	127.9	25.0	25.0	.466	121.1	25.0
		153.4	30.0			144.4	30.0
35.0	.527	179.8	35.0	35.0	.493	169.1	35.0
		206.1	40.0			193.7	40.0
45.0	.415	226.9	45.0	45.0	.394	213.4	45.0
		247.6	50.0			233.1	50.0
55.0	.382	266.7	55.0	55.0	.375	251.9	55.0
		285.8	60.0			270.6	60.0
65.0	.379	304.8	65.0	65.0	.379	289.6	65.0
		323.8	70.0			308.6	70.0
75.0	.387	343.1	75.0	75.0	.373	327.2	75.0
		362.5	80.0			345.8	80.0
85.0	.415	383.3	85.0	85.0	.417	366.7	85.0
		404.0	90.0			387.5	90.0
95.0	.429	425.5	95.0	95.0	.435	409.3	95.0
		446.9	100.0			431.0	100.0
105.0	.420	467.9	105.0	105.0	.396	450.8	105.0
		488.9	110.0			470.6	110.0
115.0	.362	507.0	115.0	115.0	.373	489.3	115.0
		525.1	120.0			507.9	120.0
125.0	.359	543.1	125.0	125.0	.359	525.9	125.0
		561.1	130.0			543.9	130.0
135.0	.370	579.6	135.0	135.0	.391	563.4	135.0
		598.1	140.0			583.0	140.0
145.0	.357	615.9	145.0	145.0	.381	602.0	145.0
		633.8	150.0			621.1	150.0
155.0	.370	652.3	155.0	155.0	.373	639.7	155.0
		670.8	160.0			658.4	160.0
165.0	.359	688.8	165.0	165.0	.366	676.7	165.0
		706.7	170.0			695.0	170.0
175.0	.369	725.2	175.0	175.0	.373	713.7	175.0
		743.6	180.0			732.3	180.0
185.0	.409	764.1	185.0	185.0	.405	752.6	185.0
		784.5	190.0			772.8	190.0
195.0	.478	808.4	195.0	195.0	.465	796.0	195.0
		832.3	200.0			819.3	200.0
205.0	.394	852.0	205.0	205.0	.399	839.2	205.0
		871.7	210.0			859.2	210.0
215.0	.362	889.8	215.0	215.0	.368	877.5	215.0
		907.9	220.0			895.9	220.0
225.0	.362	926.0	225.0	225.0	.368	914.3	225.0

	P3	30/10/84			P3	2/11/84	

Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.259	13.0	5.0	5.0	.366	18.3	5.0
		27.5	10.0			38.6	10.0
15.0	.322	43.6	15.0	15.0	.443	60.7	15.0
		59.6	20.0			82.9	20.0
25.0	.356	77.5	25.0	25.0	.406	103.2	25.0
		95.3	30.0			123.5	30.0
35.0	.424	116.4	35.0	35.0	.461	146.5	35.0
		137.6	40.0			169.6	40.0
45.0	.330	154.1	45.0	45.0	.359	187.5	45.0
		170.7	50.0			205.5	50.0
55.0	.321	186.7	55.0	55.0	.348	222.9	55.0
		202.7	60.0			240.3	60.0
65.0	.360	220.7	65.0	65.0	.379	259.2	65.0
		238.7	70.0			278.2	70.0
75.0	.373	257.4	75.0	75.0	.376	297.0	75.0
		276.1	80.0			315.8	80.0
85.0	.406	296.4	85.0	85.0	.403	336.0	85.0
		316.6	90.0			356.2	90.0
95.0	.432	338.2	95.0	95.0	.437	378.0	95.0
		359.8	100.0			399.9	100.0
105.0	.385	379.1	105.0	105.0	.394	419.6	105.0
		398.4	110.0			439.3	110.0
115.0	.354	416.1	115.0	115.0	.361	457.3	115.0
		433.8	120.0			475.3	120.0
125.0	.361	451.8	125.0	125.0	.359	493.3	125.0
		469.9	130.0			511.3	130.0
135.0	.369	488.3	135.0	135.0	.381	530.3	135.0
		506.7	140.0			549.4	140.0
145.0	.359	524.7	145.0	145.0	.359	567.4	145.0
		542.7	150.0			585.4	150.0
155.0	.359	560.7	155.0	155.0	.358	603.3	155.0
		578.6	160.0			621.2	160.0
165.0	.353	596.3	165.0	165.0	.368	639.5	165.0
		613.9	170.0			657.9	170.0
175.0	.365	632.1	175.0	175.0	.377	676.8	175.0
		650.4	180.0			695.6	180.0
185.0	.410	670.9	185.0	185.0	.411	716.2	185.0
		691.4	190.0			736.8	190.0
195.0	.462	714.5	195.0	195.0	.480	760.8	195.0
		737.6	200.0			784.8	200.0
205.0	.406	757.9	205.0	205.0	.398	804.6	205.0
		778.2	210.0			824.5	210.0
215.0	.374	796.9	215.0	215.0	.368	842.9	215.0
		815.6	220.0			861.3	220.0
225.0	.374	834.3	225.0	225.0	.368	879.7	225.0

P3	8/11/84			P3	15/11/84		
Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.273	13.6	5.0	5.0	.229	11.4	5.0
		29.0	10.0			24.2	10.0
15.0	.341	46.0	15.0	15.0	.281	38.3	15.0
		63.0	20.0			52.3	20.0
25.0	.363	81.2	25.0	25.0	.313	68.0	25.0
		99.3	30.0			83.6	30.0
35.0	.427	120.6	35.0	35.0	.383	102.7	35.0
		142.0	40.0			121.9	40.0
45.0	.329	158.5	45.0	45.0	.307	137.2	45.0
		174.9	50.0			152.6	50.0
55.0	.326	191.2	55.0	55.0	.297	167.4	55.0
		207.5	60.0			182.3	60.0
65.0	.344	224.7	65.0	65.0	.327	198.7	65.0
		241.9	70.0			215.0	70.0
75.0	.373	260.6	75.0	75.0	.350	232.5	75.0
		279.2	80.0			250.0	80.0
85.0	.417	300.1	85.0	85.0	.411	270.6	85.0
		320.9	90.0			291.2	90.0
95.0	.425	342.2	95.0	95.0	.437	313.0	95.0
		363.4	100.0			334.9	100.0
105.0	.380	382.4	105.0	105.0	.384	354.1	105.0
		401.4	110.0			373.3	110.0
115.0	.348	418.8	115.0	115.0	.358	391.2	115.0
		436.3	120.0			409.1	120.0
125.0	.346	453.6	125.0	125.0	.354	426.8	125.0
		470.8	130.0			444.5	130.0
135.0	.369	489.3	135.0	135.0	.374	463.2	135.0
		507.7	140.0			482.0	140.0
145.0	.374	526.5	145.0	145.0	.358	499.9	145.0
		545.2	150.0			517.8	150.0
155.0	.362	563.3	155.0	155.0	.359	535.7	155.0
		581.4	160.0			553.7	160.0
165.0	.353	599.0	165.0	165.0	.372	572.3	165.0
		616.7	170.0			590.9	170.0
175.0	.366	635.0	175.0	175.0	.362	609.0	175.0
		653.3	180.0			627.1	180.0
185.0	.422	674.4	185.0	185.0	.411	647.7	185.0
		695.5	190.0			668.2	190.0
195.0	.455	718.3	195.0	195.0	.463	691.4	195.0
		741.0	200.0			714.6	200.0
205.0	.387	760.4	205.0	205.0	.388	734.0	205.0
		779.7	210.0			753.4	210.0
215.0	.366	798.0	215.0	215.0	.377	772.2	215.0
		816.3	220.0			791.1	220.0
225.0	.366	834.6	225.0	225.0	.377	810.0	225.0

P3	2/12/84

Z(cm)	TETA	STOCK	Z(cm)
5.0	.200	10.0	5.0
		21.3	10.0
15.0	.251	33.8	15.0
		46.4	20.0
25.0	.279	60.3	25.0
		74.3	30.0
35.0	.329	90.7	35.0
		107.2	40.0
45.0	.252	119.8	45.0
		132.4	50.0
55.0	.267	145.7	55.0
		159.0	60.0
65.0	.302	174.1	65.0
		189.2	70.0
75.0	.330	205.8	75.0
		222.3	80.0
85.0	.369	240.7	85.0
		259.2	90.0
95.0	.379	278.1	95.0
		297.0	100.0
105.0	.374	315.8	105.0
		334.5	110.0
115.0	.355	352.3	115.0
		370.0	120.0
125.0	.358	387.9	125.0
		405.8	130.0
135.0	.361	423.9	135.0
		441.9	140.0
145.0	.365	460.1	145.0
		478.4	150.0
155.0	.366	496.7	155.0
		515.0	160.0
165.0	.361	533.1	165.0
		551.1	170.0
175.0	.365	569.3	175.0
		587.6	180.0
185.0	.417	608.4	185.0
		629.3	190.0
195.0	.469	652.7	195.0
		676.2	200.0
205.0	.392	695.8	205.0
		715.4	210.0
215.0	.369	733.8	215.0
		752.3	220.0
225.0	.369	770.7	225.0

P3	22/ 1/85

Z(cm)	TETA	STOCK	Z(cm)
5.0	.174	8.7	5.0
		19.1	10.0
15.0	.240	31.1	15.0
		43.1	20.0
25.0	.269	56.5	25.0
		70.0	30.0
35.0	.313	85.6	35.0
		101.2	40.0
45.0	.223	112.4	45.0
		123.5	50.0
55.0	.232	135.1	55.0
		146.7	60.0
65.0	.272	160.2	65.0
		173.8	70.0
75.0	.285	188.1	75.0
		202.4	80.0
85.0	.309	217.8	85.0
		233.3	90.0
95.0	.320	249.2	95.0
		265.2	100.0
105.0	.327	281.6	105.0
		297.9	110.0
115.0	.339	314.8	115.0
		331.8	120.0
125.0	.333	348.4	125.0
		365.1	130.0
135.0	.362	383.2	135.0
		401.3	140.0
145.0	.368	419.7	145.0
		438.1	150.0
155.0	.355	455.9	155.0
		473.6	160.0
165.0	.354	491.3	165.0
		509.0	170.0
175.0	.359	527.0	175.0
		545.0	180.0
185.0	.403	565.1	185.0
		585.3	190.0
195.0	.451	607.8	195.0
		630.4	200.0
205.0	.388	649.8	205.0
		669.2	210.0
215.0	.361	687.2	215.0
		705.3	220.0
225.0	.361	723.3	225.0

	P3	5/ 4/85			P3	9/ 5/85	
Z(cm)	TETA	STOCK	Z(cm)	Z(cm)	TETA	STOCK	Z(cm)
5.0	.145	7.2	5.0	5.0	.169	8.4	5.0
		15.2	10.0			17.0	10.0
15.0	.172	23.8	15.0	15.0	.176	25.9	15.0
		32.4	20.0			34.7	20.0
25.0	.238	44.3	25.0	25.0	.204	44.9	25.0
		56.2	30.0			55.0	30.0
35.0	.297	71.0	35.0	35.0	.299	70.0	35.0
		85.8	40.0			84.9	40.0
45.0	.231	97.4	45.0	45.0	.256	97.7	45.0
		108.9	50.0			110.5	50.0
55.0	.213	119.5	55.0	55.0	.202	120.6	55.0
		130.2	60.0			130.7	60.0
65.0	.235	142.0	65.0	65.0	.222	141.8	65.0
		153.7	70.0			152.9	70.0
75.0	.256	166.5	75.0	75.0	.246	165.2	75.0
		179.3	80.0			177.5	80.0
85.0	.269	192.8	85.0	85.0	.242	189.6	85.0
		206.2	90.0			201.7	90.0
95.0	.291	220.8	95.0	95.0	.286	216.0	95.0
		235.4	100.0			230.3	100.0
105.0	.297	250.2	105.0	105.0	.283	244.4	105.0
		265.0	110.0			258.5	110.0
115.0	.298	279.9	115.0	115.0	.284	272.7	115.0
		294.8	120.0			287.0	120.0
125.0	.312	310.4	125.0	125.0	.310	302.5	125.0
		325.9	130.0			318.0	130.0
135.0	.322	342.1	135.0	135.0	.321	334.0	135.0
		358.2	140.0			350.1	140.0
145.0	.322	374.3	145.0	145.0	.321	366.1	145.0
		390.4	150.0			382.2	150.0
155.0	.322	406.6	155.0	155.0	.324	398.4	155.0
		422.7	160.0			414.6	160.0
165.0	.340	439.7	165.0	165.0	.335	431.3	165.0
		456.7	170.0			448.1	170.0
175.0	.368	475.1	175.0	175.0	.368	466.4	175.0
		493.5	180.0			484.8	180.0
185.0	.418	514.4	185.0	185.0	.435	506.6	185.0
		535.3	190.0			528.3	190.0
195.0	.472	558.9	195.0	195.0	.472	551.9	195.0
		582.5	200.0			575.4	200.0
205.0	.391	602.0	205.0	205.0	.377	594.3	205.0
		621.5	210.0			613.2	210.0
215.0	.372	640.1	215.0	215.0	.365	631.4	215.0
		658.7	220.0			649.7	220.0
225.0	.359	676.7	225.0	225.0	.365	667.9	225.0

A N N E X E III

RESULTATS ANALYTIQUES

RESULTATS ANALYTIQUES

PROFIL P1

Profondeur(cm)	0-20	20-60	60-140	>140
GRANULOMETRIE %				
Argile	19,7	57,2	40,0	25,1
Limon fin	11,8	11,2	8,3	5,4
Limon grossier	15,5	5,5	5,5	5,9
Sable fin	40,7	18,4	34,9	47,4
Sable grossier	9,9	5,8	8,5	15,2
Humidité	1,2	2,5	2,0	0,8
Mat.Org.totale	1,3	1,3	0,7	0,2
Total	100,1	101,9	99,9	100,0
FERTILITE				
Carbone %.	7,4	7,6	3,9	1,4
CARACTERISTIQUES PHYSIQUES				
pF 3,0	13,1	29,7	21,5	12,9
pF 4,2	8,9	26,3	18,1	10,3
D.A. motte	1,7	1,5	1,6	1,8
Porosité %	32,0	39,3	35,8	27,5
K en cm/h	2,8	4,0	2,9	2,6
Refus 2 mm	0	O	O	6,1
Profondeur(cm)	0-10	10-60	60-140	>140
D.A. cylindre	1,59	1,26	1,42	1,72

pH CONDUCTIVITE ET CHLORURES A LA MISE EN PLACE DU TUBE P1

| Prof. | pH | | EXTRAIT | CE | Cl- |
| | SOL | | | mS/cm | mé/l |
(cm)	EAU	KCl	1/5	20°	
0-10	4,6	4,1	5,1	0,135	0,34
10-20	4,2	3,7	4,5	0,165	0,65
20-30	3,9	3,6	4,2	0,150	0,34
30-40	4,0	3,7	5,2	0,100	0,48
40-50	4,0	3,8	4,2	O,155	0,49
50-60	4,0	3,8	5,3	0,115	0,68
60-70	-	-	5,5	0,330	0,75
70-80	4,4	4,2	6,2	0,305	0,17
80-90	4,4	4,1	6,0	0,047	0,34
90-100	4,2	4,0	5,8	0,045	0,23
100-120	4,3	4,0	5,4	0,043	0,33
120-140	4,2	4,0	5,8	0,042	0,32
140-160	4,1	4,0	5,9	0,031	0,18
160-180	4,2	3,8	5,6	0,015	0,28
180-200	4,3	3,8	5,2	0,02	0,24
200-220	4,2	3,8	5,0	0,03	0,21
220-240	4,3	3,9	5,4	0,02	0,12
240-260	4,2	3,8	5,2	0,03	0,17
260-280	4,3	3,9	5,3	0,02	0,15
280-300	4,3	4,0	5,4	0,03	0,18
300-320	4,4	4,0	5,5	0,03	0,18

RESULTATS ANALYTIQUES

PROFIL P2

Profondeur(cm)	0-40	40-110	110-190
GRANULOMETRIE %			
Argile	59,4	23,3	21,7
Limon fin	15,1	8,3	8,9
Limon grossier	10,8	13,3	16,1
Sable fin	8,7	38,4	41,0
Sable grossier	2,3	14,5	11,7
Humidité	1,9	1,3	1,3
Mat.Org.totale	1,1	0,3	0,2
Total	99,3	99,4	100,9
FERTILITE			
Carbone %.	6,6	1,8	1,2
CARACTERISTIQUES PHYSIQUES			
pF 3,0	28,0	12,8	12,0
pF 4,2	23,4	9,7	8,9
Profondeur(cm)	0-40	40-110	110-190
D.A. cylindre	1,46	1,71	1,78

pH,CONDUCTIVITE ET CHLORURES A LA MISE EN PLACE DU TUBE P2

| Prof. | pH | | EXTRAIT | CE | Cl- |
| | SOL | | | mS/cm | mé/l |
(cm)	EAU	KCl	1/5	20°	
0-10	4,0	3,5	4,2	0,205	0,45
10-20	4,2	3,7	4,1	0,235	0,90
20-30	3,9	3,4	4,0	0,215	0,53
30-40	3,9	3,4	4,1	0,170	0,49
40-50	4,1	3,5	4,2	0,130	0,33
50-60	4,2	3,6	4,5	0,118	0,34
60-70	4,2	3,6	4,4	0,115	0,68
70-80	4,2	3,7	4,3	0,087	0,25
80-90	4,1	3,7	4,4	0,088	0,33
90-100	4,1	3,7	4,4	0,091	0,36
100-120	4,1	3,6	4,3	0,078	0,32
120-140	4,0	3,6	4,4	0,089	0,38
140-160	4,1	3,6	4,4	0,072	0,23
160-180	4,1	3,6	4,4	0,090	0,34
180-200	-	-	4,6	0,089	0,44
200-220	4,5	3,9	4,9	0,071	0,39

RESULTATS ANALYTIQUES

PROFIL P3

Profondeur(cm)	0-20	20-40	40-80	80-120
GRANULOMETRIE %				
Argile	37,5	51,4	30,4	21,3
Limon fin	16,7	15,3	2,2	7,4
Limon grossier	18,7	15,2	8,6	12,1
Sable fin	19,1	5,9	35,6	41,8
Sable grossier	3,1	5,4	19,5	15,4
Humidité	2,3	4,0	1,8	2,0
Mat.Org.totale	2,2	1,1	0,3	0,2
Total	99,6	98,3	98,4	100,1
FERTILITE				
Carbone %.	12,6	6,2	1,8	1,2
CARACTERISTIQUES PHYSIQUES				
pF 3,0	22,4	28,5	13,5	11,9
pF 4,2	16,4	22,1	10,4	8,8
Profondeur(cm)	0-20	20-40	40-80	80-190
D.A. cylindre	1,45	1,28	1,45	1,71

pH CONDUCTIVITE ET CHLORURES A LA MISE EN PLACE DU TUBE P3

Prof.	pH		EXTRAIT	CE	Cl-
	SOL			mS/cm	mé/l
(cm)	EAU	KCl	1/5	20°	
0-10	4,3	3,8	4,7	1,05	8,75
10-20	4,0	3,7	4,1	1,35	12,25
20-30	3,9	3,5	3,9	1,76	16,00
30-40	3,8	3,5	4,0	2,05	18,75
40-50	4,1	3,8	4,2	1,30	11,00
50-60	3,8	3,6	4,0	1,35	11,75
60-70	3,7	3,5	3,9	1,55	14,00
70-80	3,8	3,6	4,0	1,70	15,50
80-90	3,7	3,5	3,9	1,55	13,75
90-100	3,8	3,6	4,0	1,68	15,00
100-120	3,8	3,6	4,0	1,40	12,50
120-140	4,1	3,8	4,3	1,50	13,00
140-160	4,4	4,0	4,5	1,60	14,25
160-180	5,2	4,7	5,3	1,75	15,50
180-200	6,1	5,5	6,1	2,35	22,00