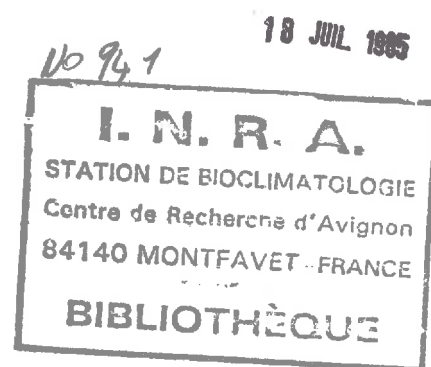


ANALYSE DE L'ESPACE AGRICOLE PAR INTERPRETATION D'IMAGES SATELLITE NOAA

Suivi des cultures et étude de paramètres bioclimatiques,
du Languedoc à la Gascogne

Isabelle ANGLADE

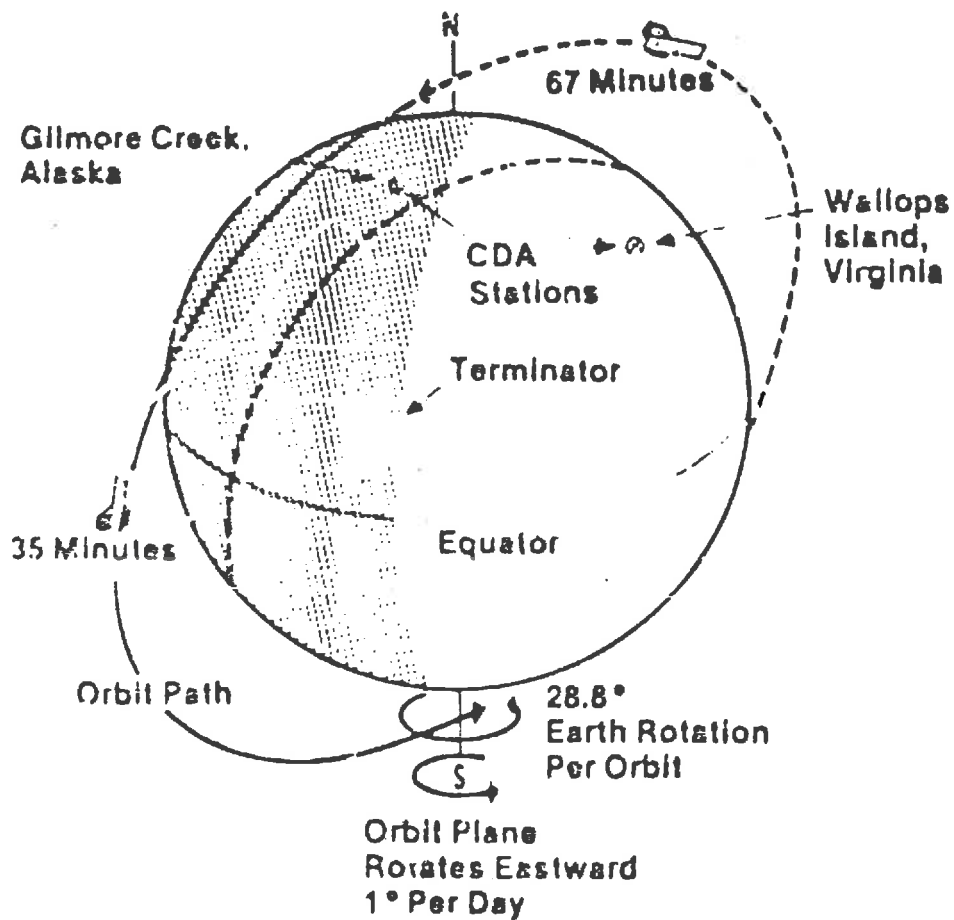
figures



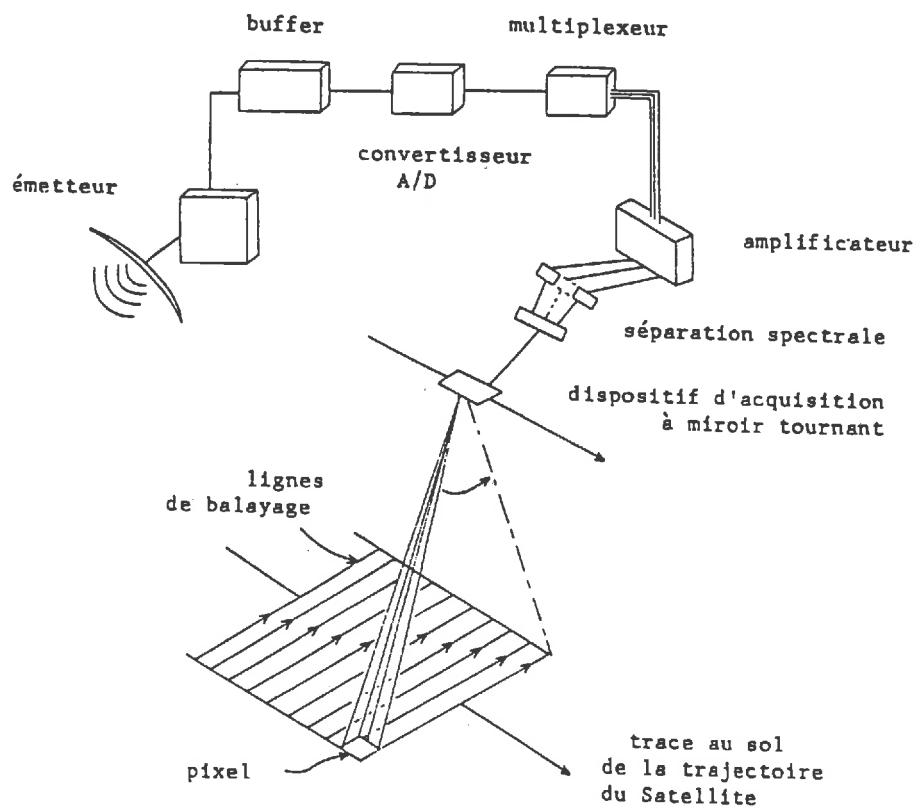
AH-TH2.2

Thèse présentée pour le Doctorat de 3e Cycle

AVRIL 1985

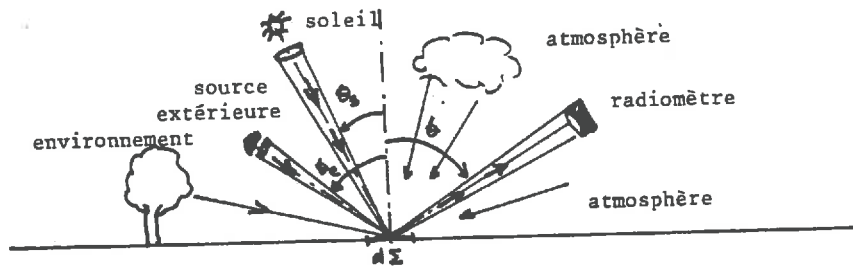


a) ORBITE DU SATELLITE

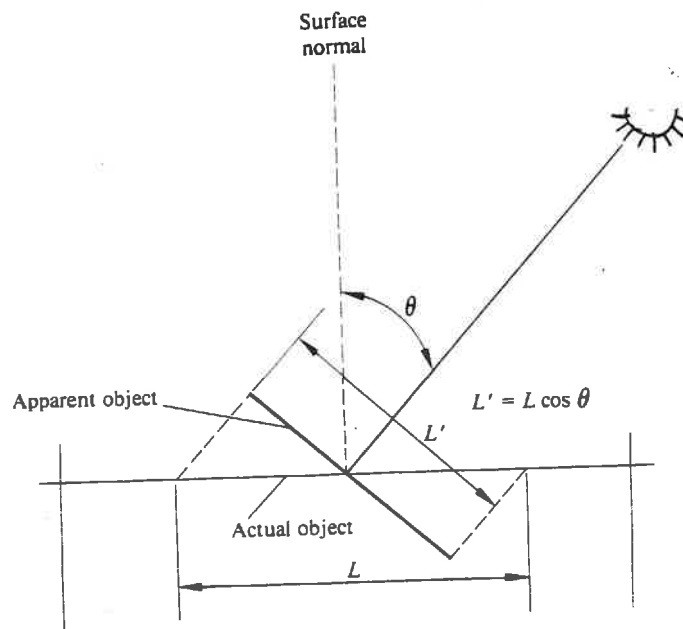


b) PRINCIPE DE FONCTIONNEMENT DU AVHRR

Figure 2 LE SATELLITE NOAA ET LE AVHRR

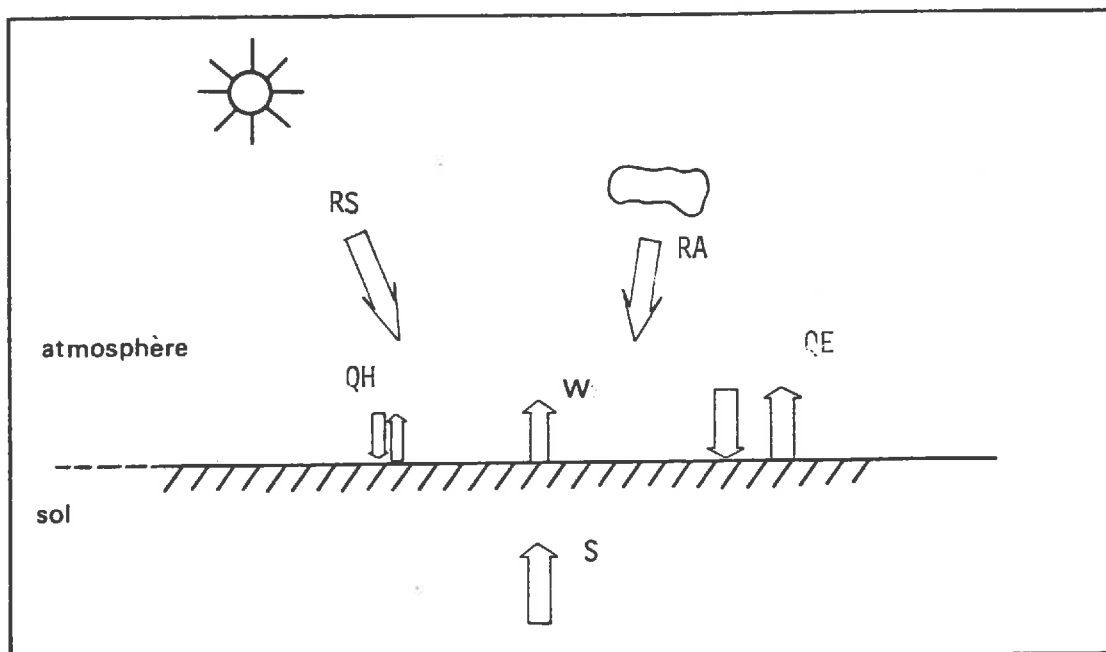


a) Paramètres intervenants



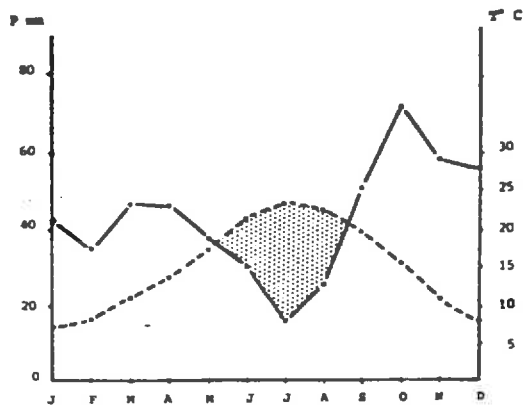
b) Correction de l'angle d'incidence solaire

Figure 3 LES CORRECTIONS D'ECLAIREMENT

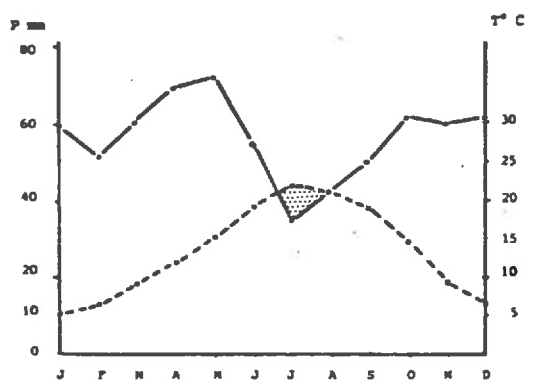


- RS Rayonnement solaire
- RA Rayonnement atmosphérique
- S Flux de chaleur dans le sol
- QH Flux de chaleur sensible
- QE Flux de chaleur latente
- w $\varepsilon\sigma T_s^4$

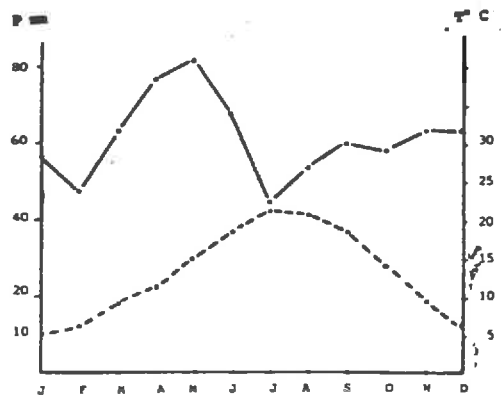
FIGURE 5 BILAN THERMIQUE D'UN SOL



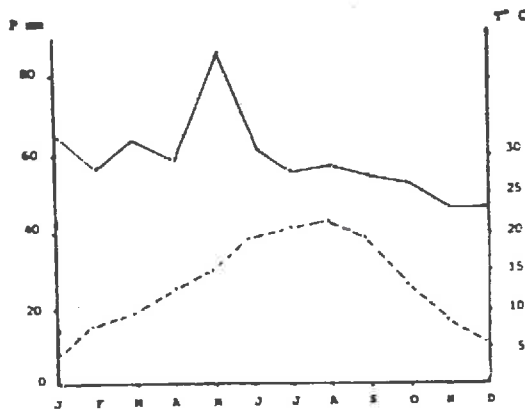
a. NARBONNE



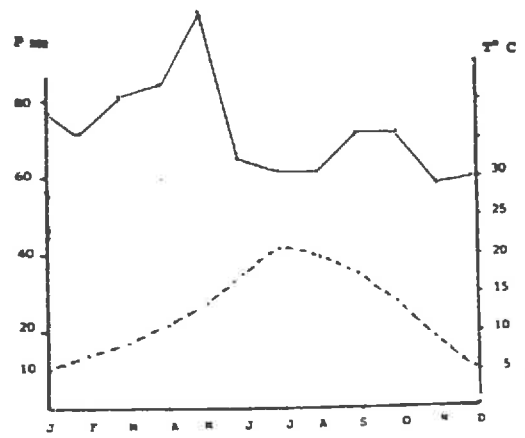
b. CARCASSONNE



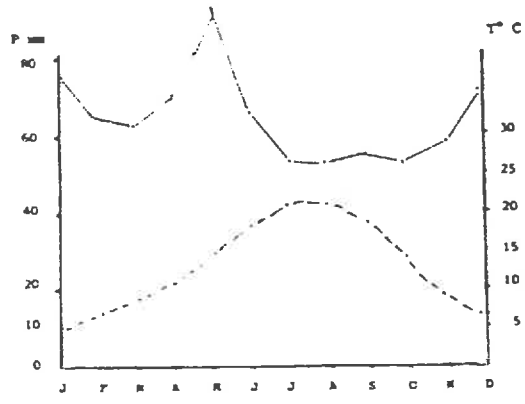
c. CASTELNAUDARY



d. TOULOUSE



e. REVEL



f. AUCH

FIGURE 6 DIAGRAMMES OMBROTHERMIQUES

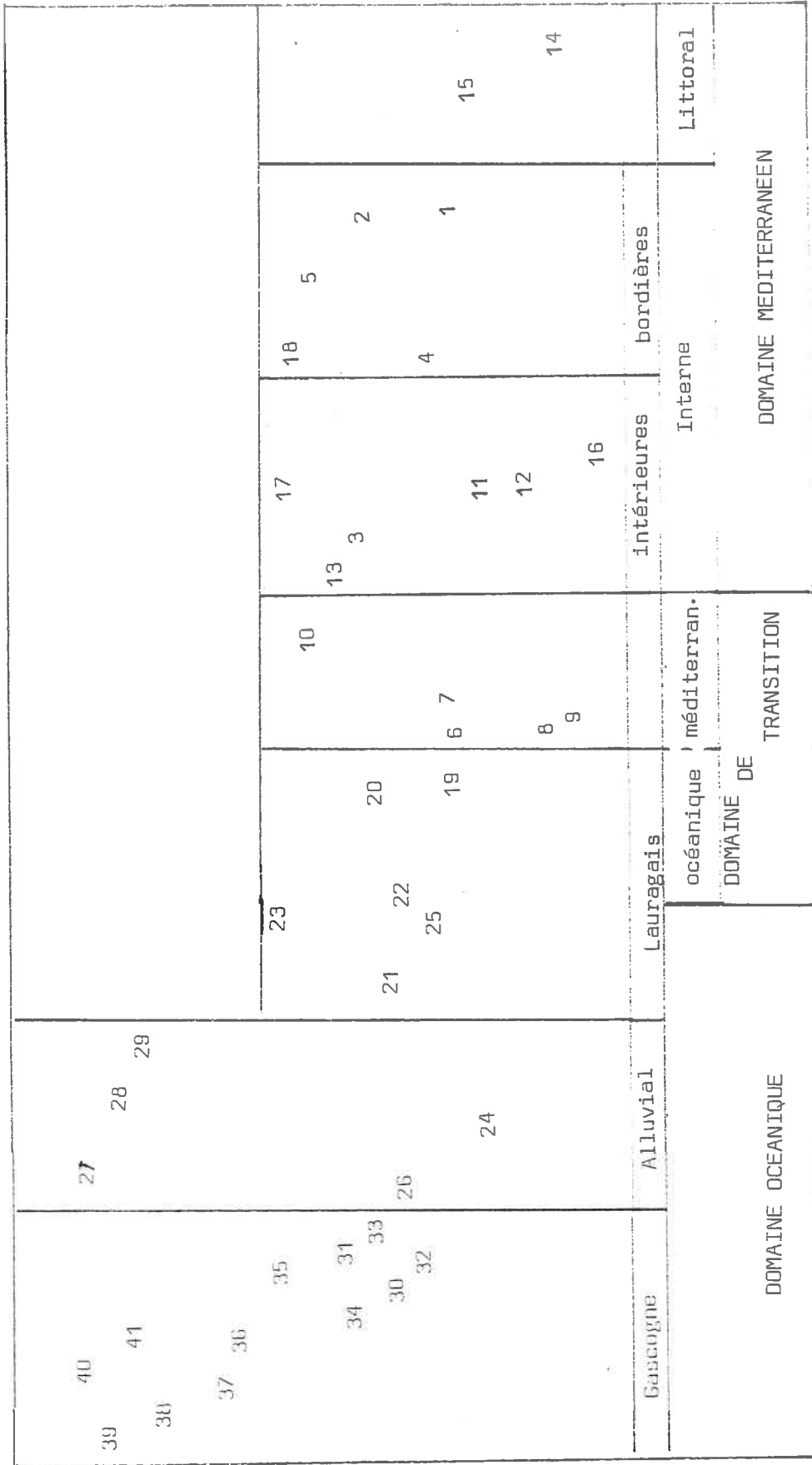
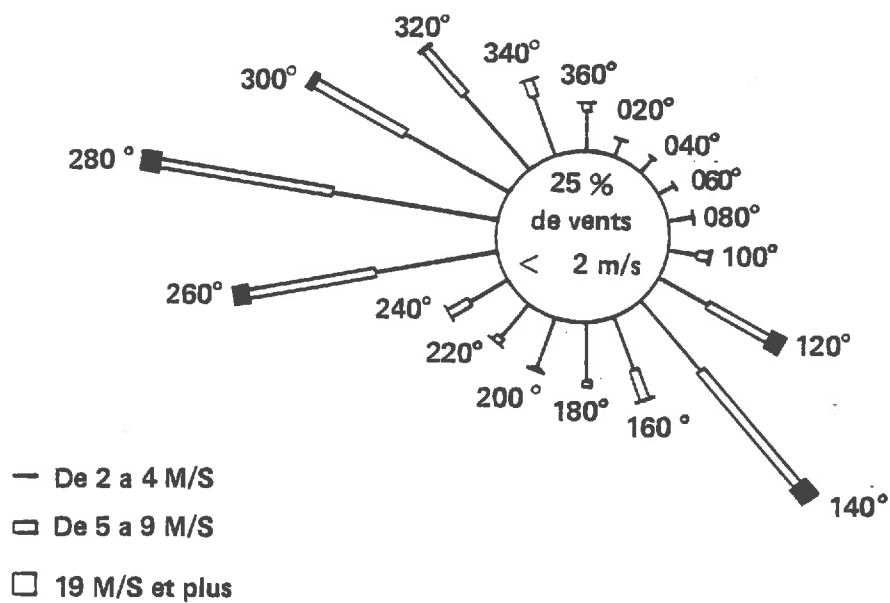


FIGURE 7 CARACTERISTIQUES CLIMATIQUES REGIONALES

b) STATION DE TOULOUSE BLAGNAC
période de 1949-1975



a) STATION DE CARCASSONNE-SALVAZA
période 1962-1975)

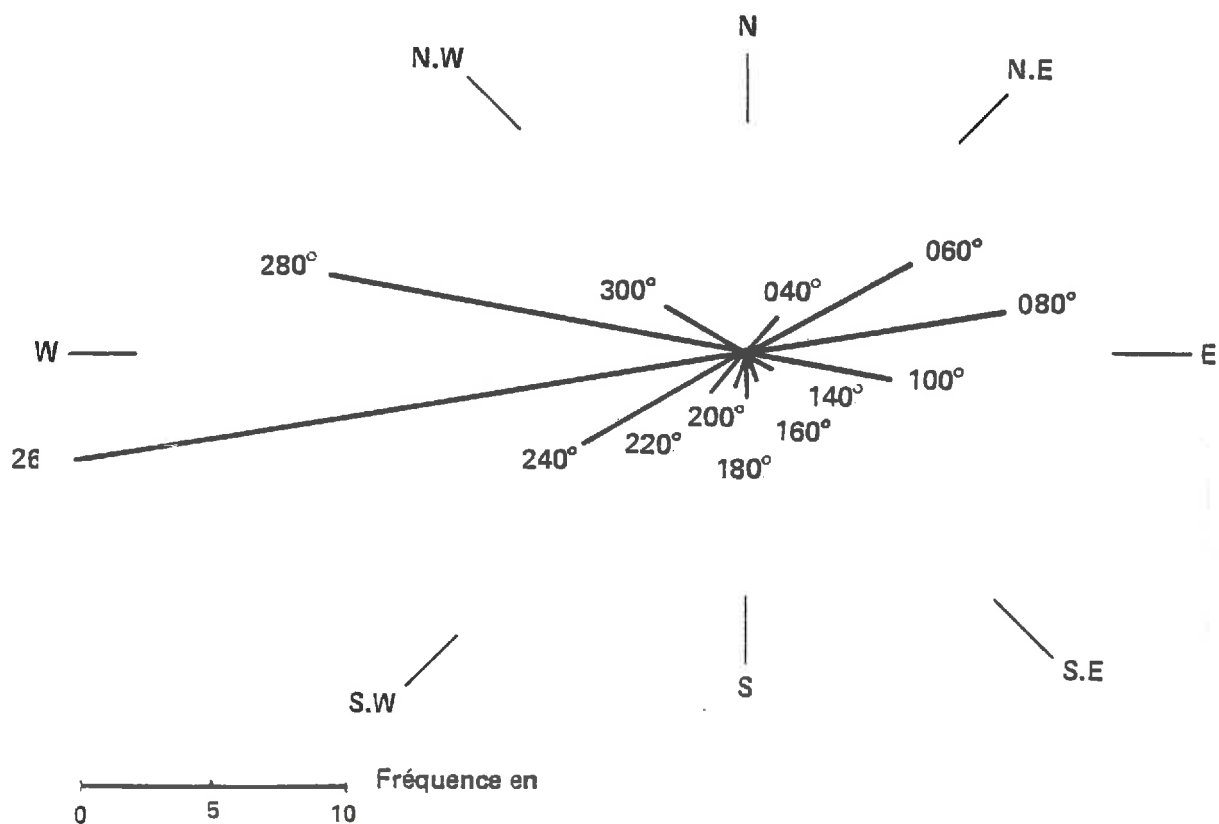


Figure 8 : ROSES DES VENTS DE TOULOUSE ET CARCASSONNE

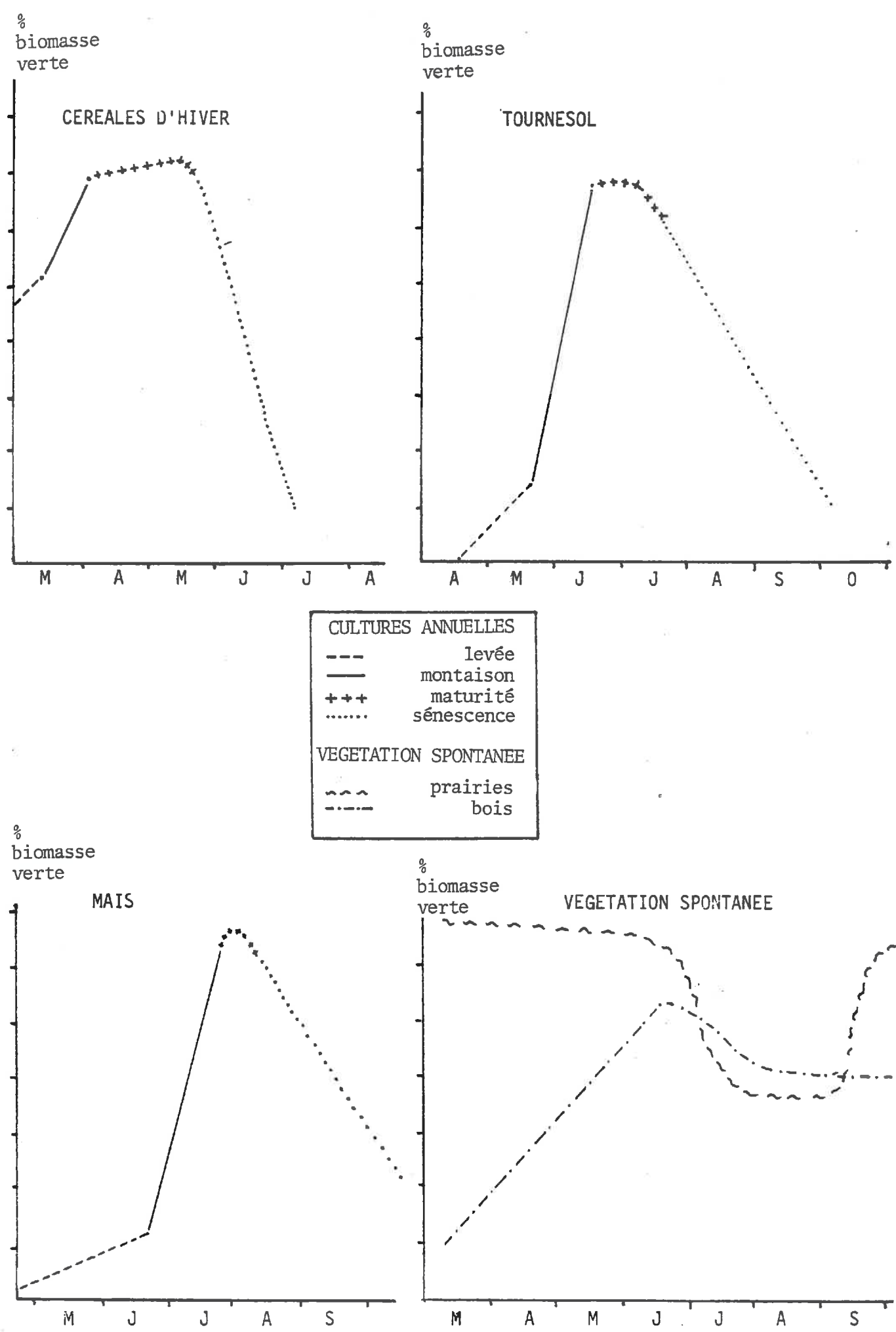
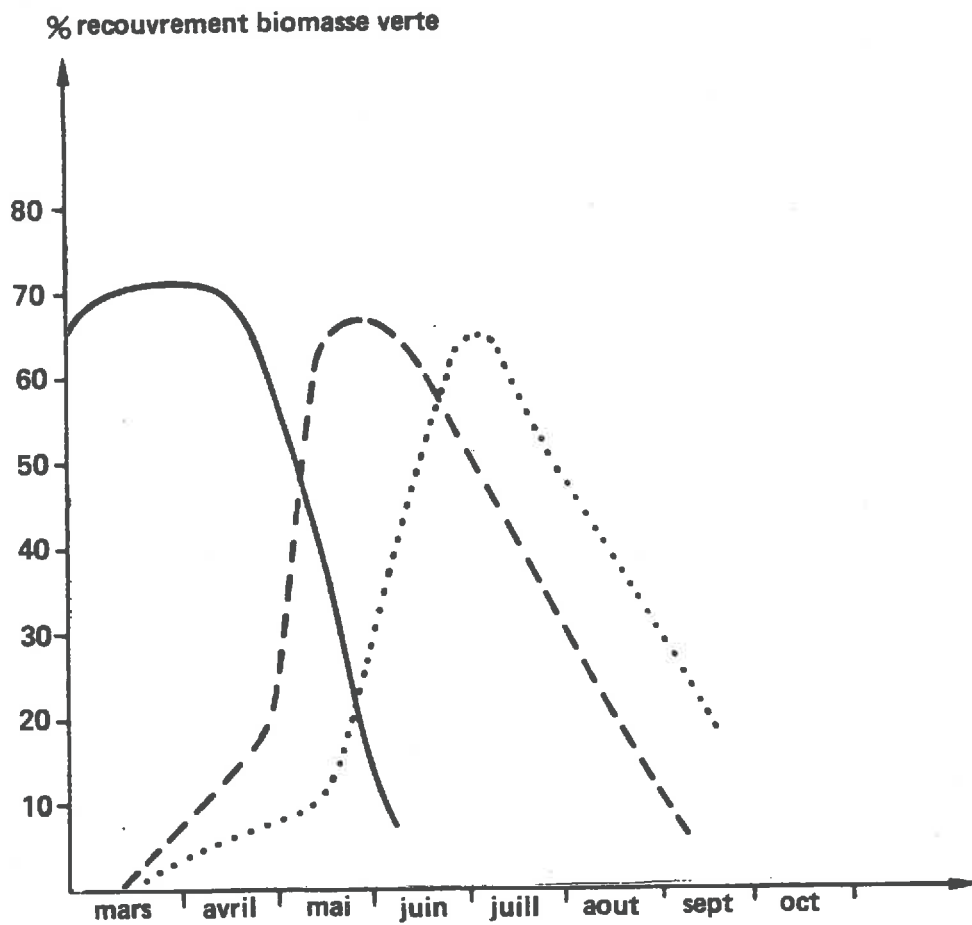


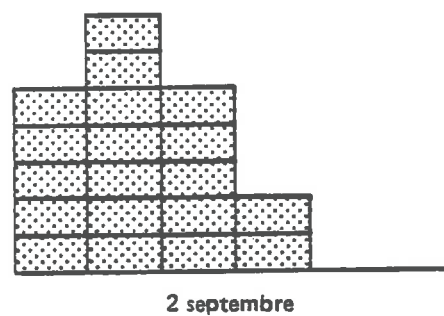
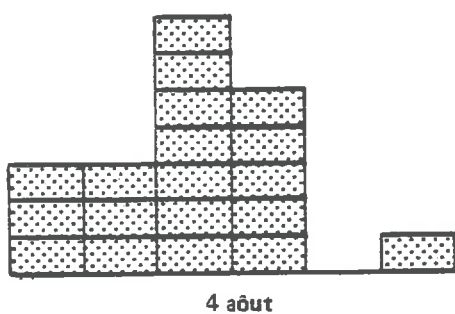
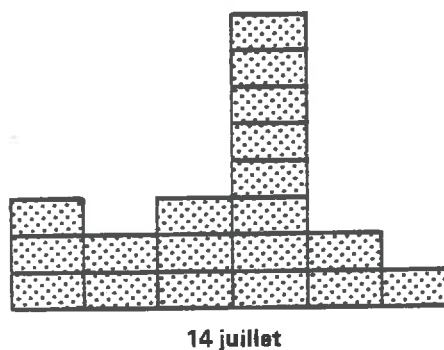
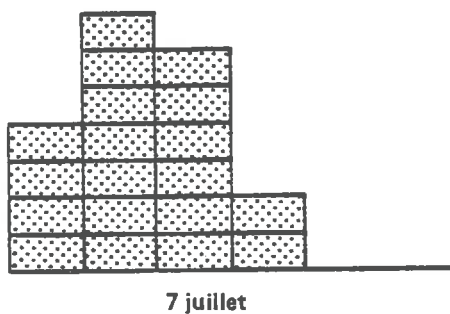
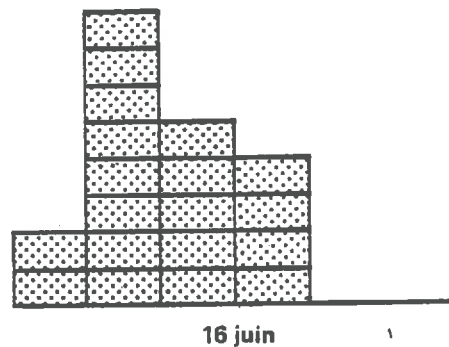
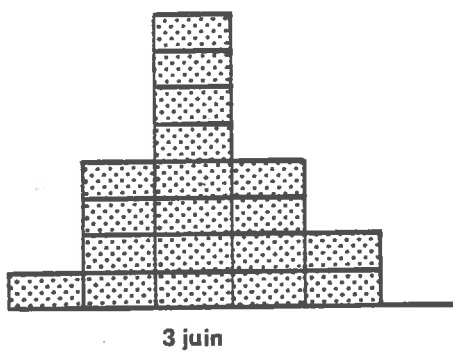
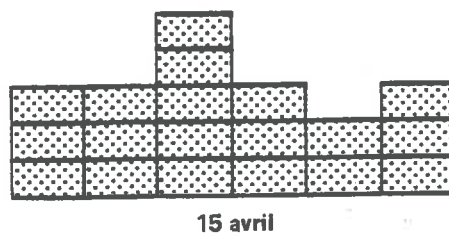
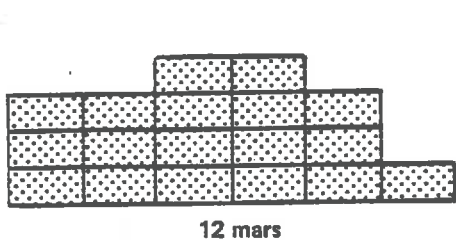
Figure 9 COURBE TYPE DES PRINCIPALES CULTURES ET DE LA VEGETATION SPONTANEE



Légende

- céréales d'hiver
- - - - - Tournesol
- maïs-sorgho

Figure 9(bis) : DECALAGES PHENOLOGIQUES ENTRE LES COURBES-TYPE DES CEREALES TOURNESOL ET MAIS-SORGHO



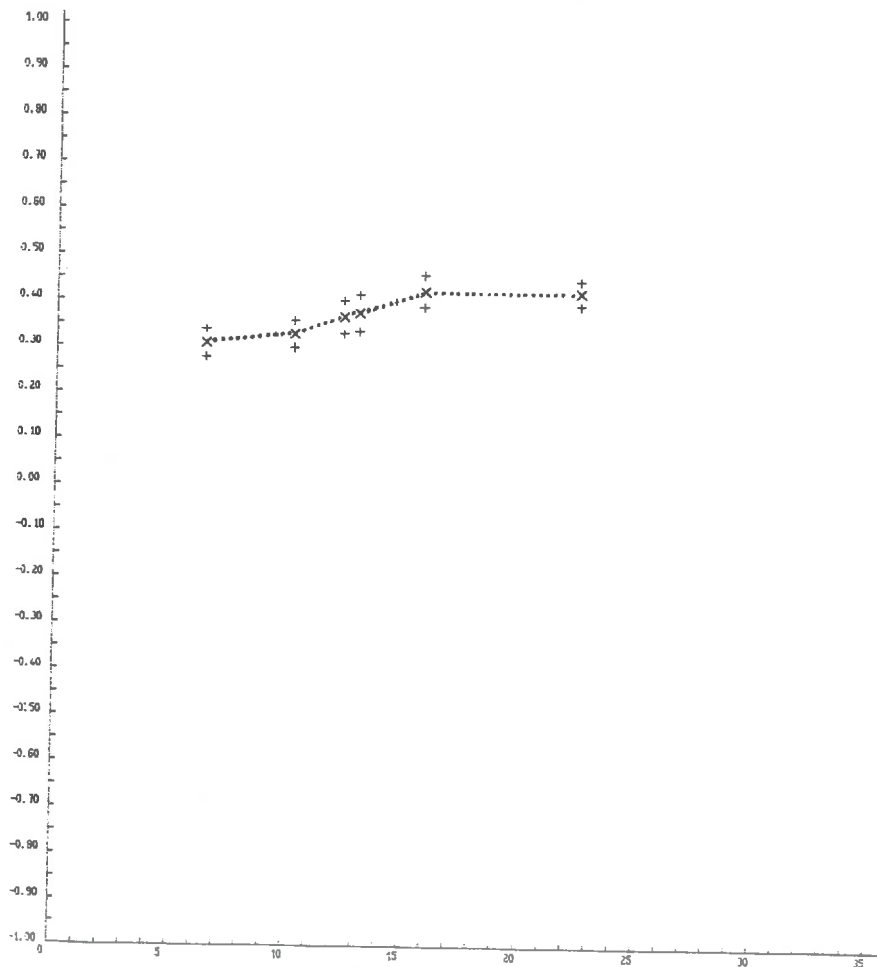
nombre d'aires



%recouvrement biomasse verte

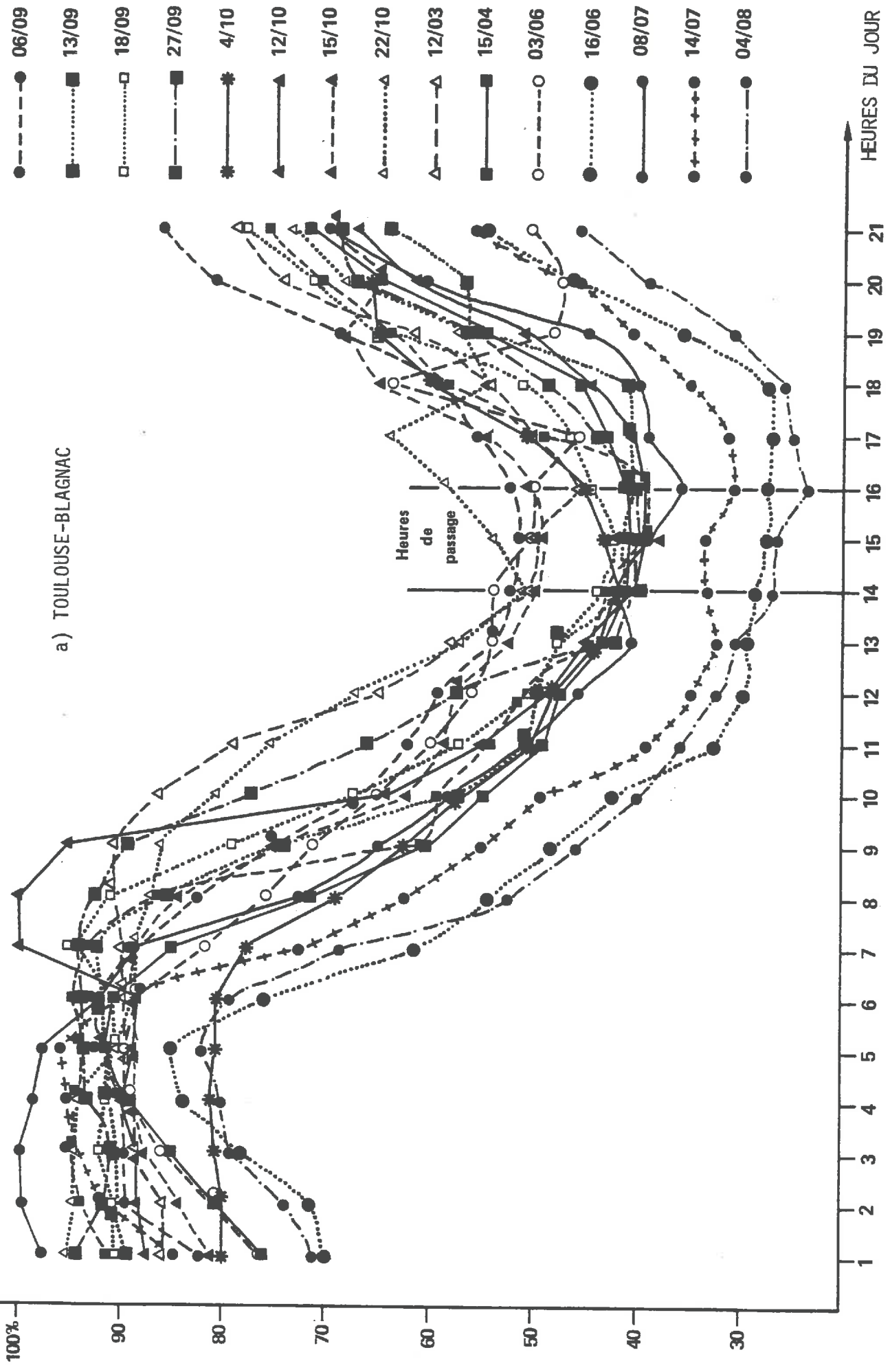
Figure 10 : HISTOGRAMMES DES AIRES D'ÉCHANTILLONNAGE
REGROUPEES PAR TAUX DE RECOUVREMENT DE BIOMASSE VERTE

INDICE DE
VEGETATION



LONGITUDE DU
NOEUD ASCENDANT

Figure 11 EFFETS DIRECTIONNELS ESTIMES SUR UNE AIRE DE POLYCLTURE EQUILIBREE



a) TOULOUSE-BLAGNAC

HEURES DU JOUR

b) CARCASSONNE - SALVAZA

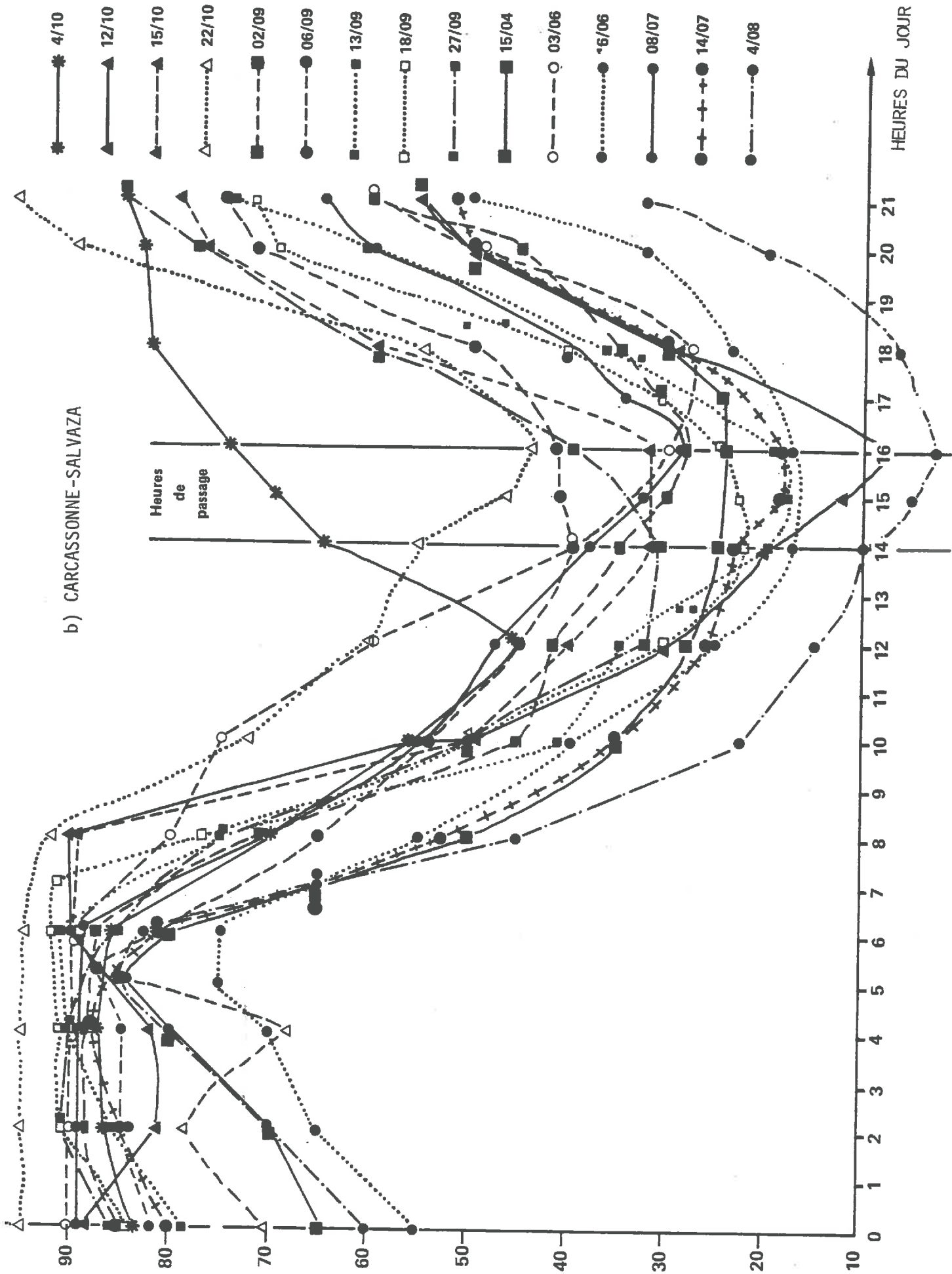
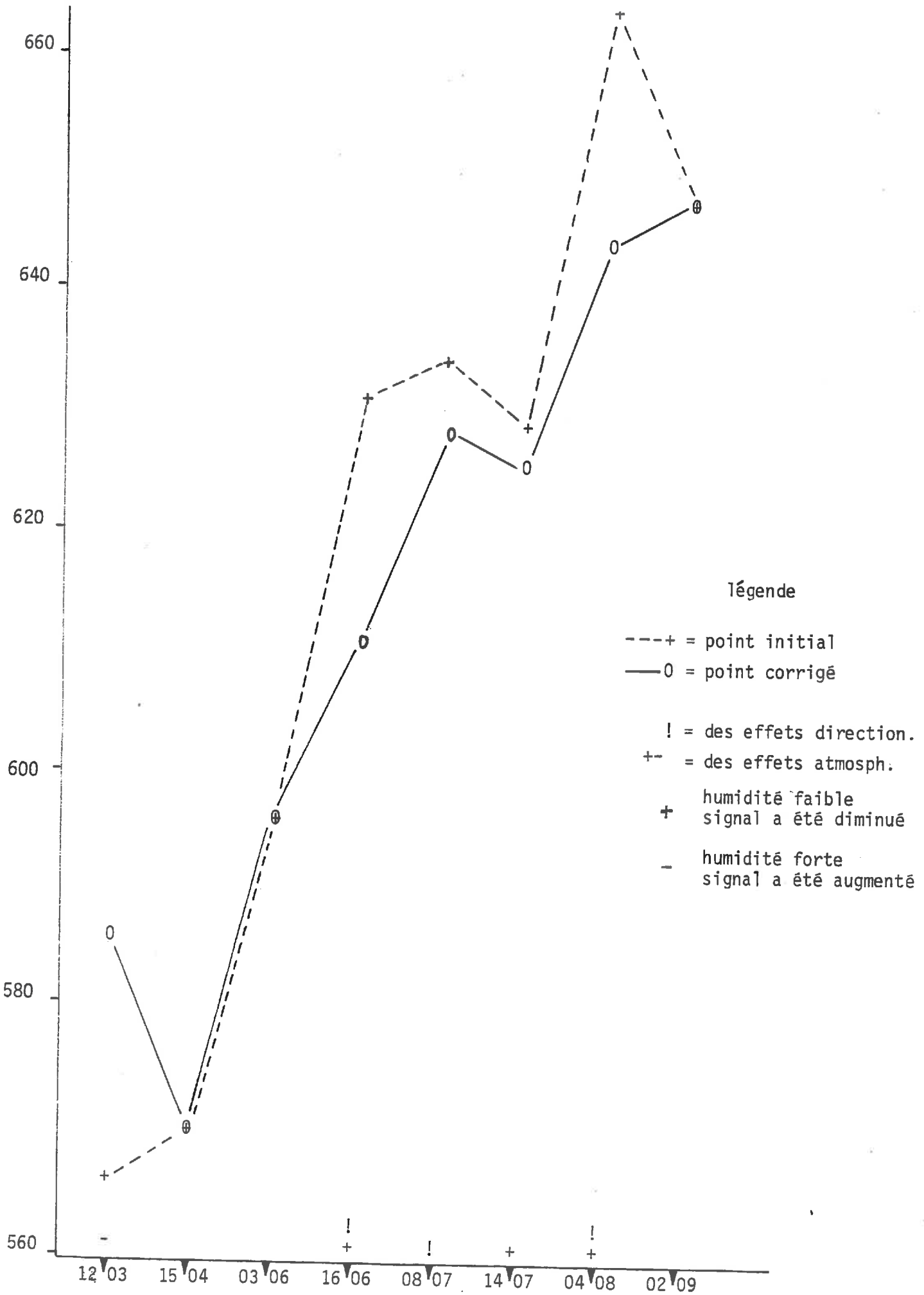


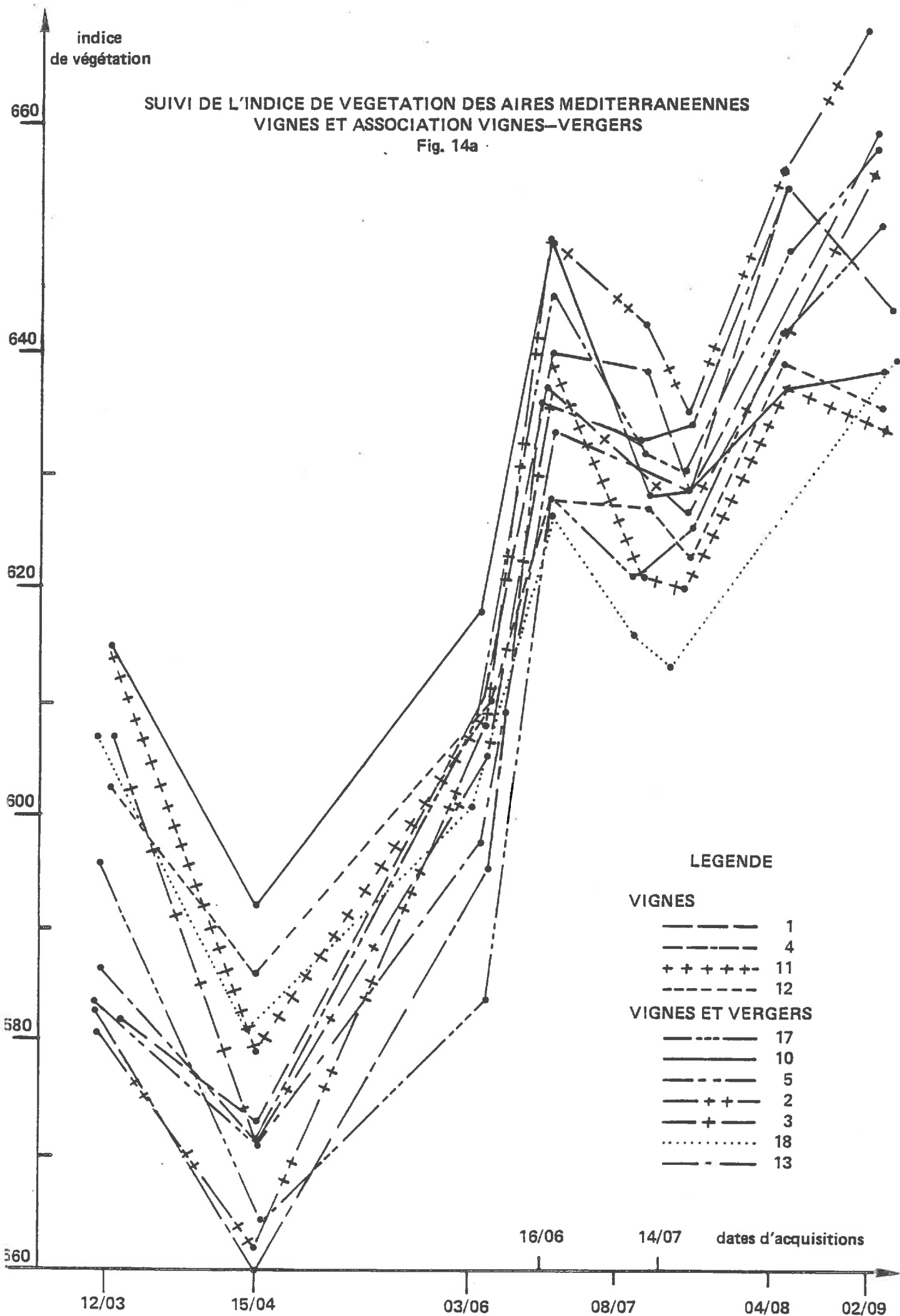
FIGURE 13 SIGNATURE TEMPORELLE COMPAREE AVANT ET APRES CORRECTION
 DES EFFETS ATMOSPHERIQUES ET DIRECTIONNELS SUR L'AIRE DE LAURE



indice
de végétation

SUIVI DE L'INDICE DE VEGETATION DES AIRES MEDITERRANEENNES VIGNES ET ASSOCIATION VIGNES-VERGERS

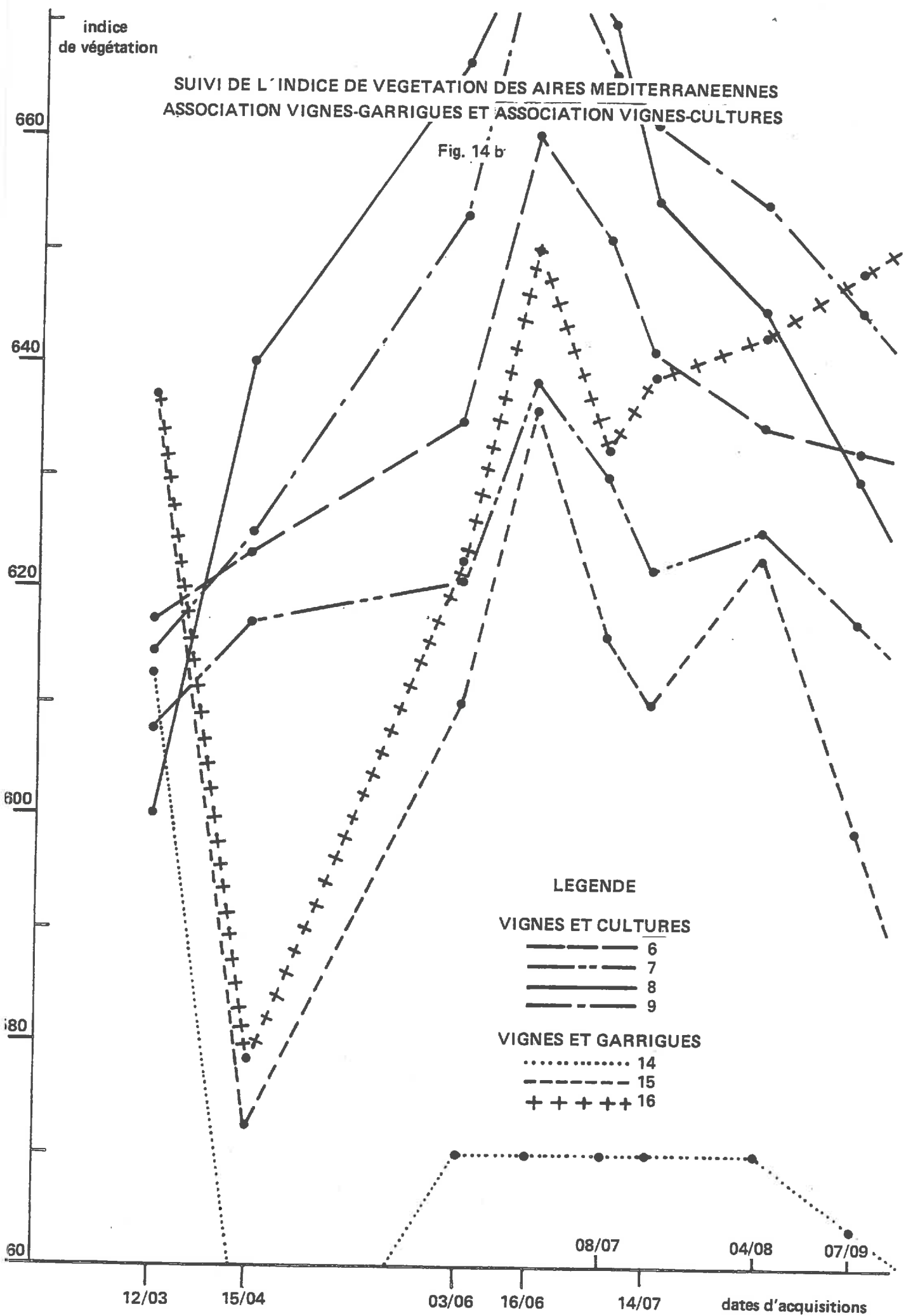
Fig. 14a



indice
de végétation

SUIVI DE L'INDICE DE VEGETATION DES AIRES MEDITERRANEENNES
ASSOCIATION VIGNES-GARRIGUES ET ASSOCIATION VIGNES-CULTURES

Fig. 14 b



LEGENDE

VIGNES ET CULTURES

- 6
- 7
- 8
- 9

VIGNES ET GARRIGUES

- 14
- 15
- 16

08/07

04/08

07/09

dates d'acquisitions

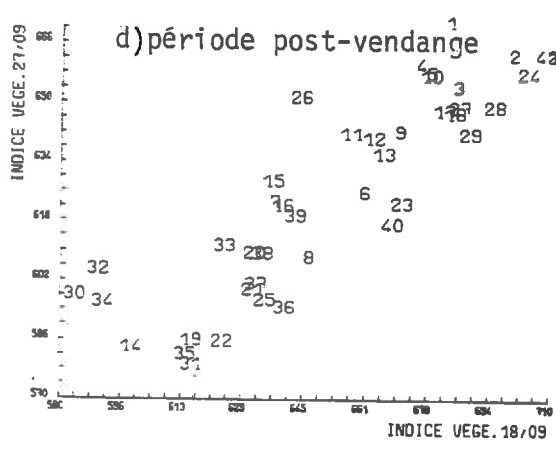
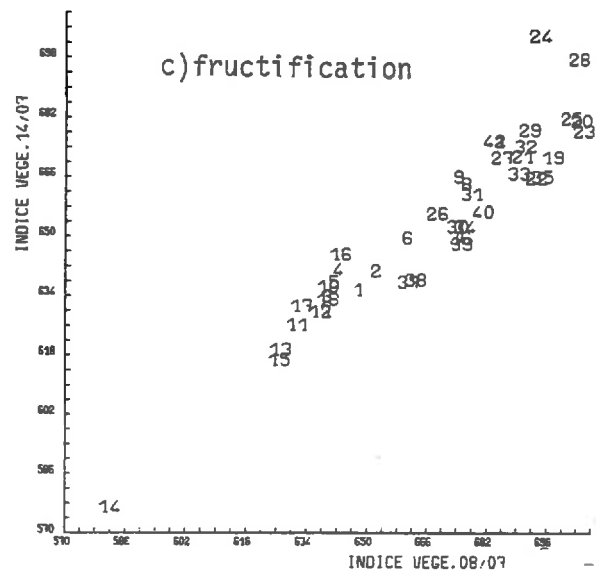
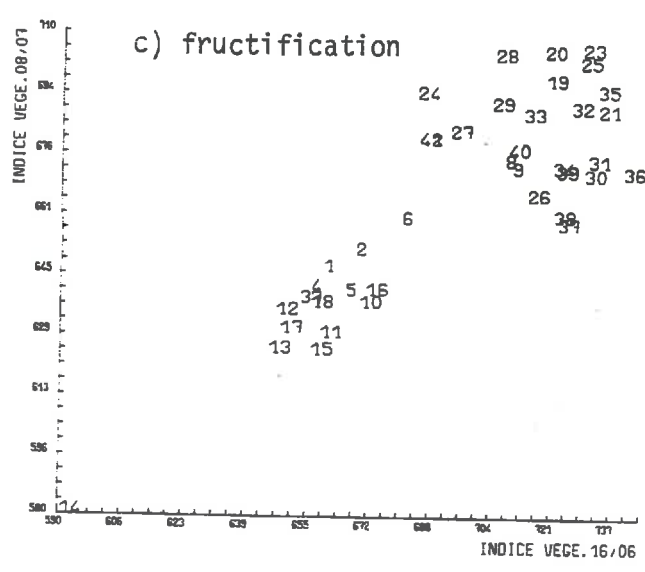
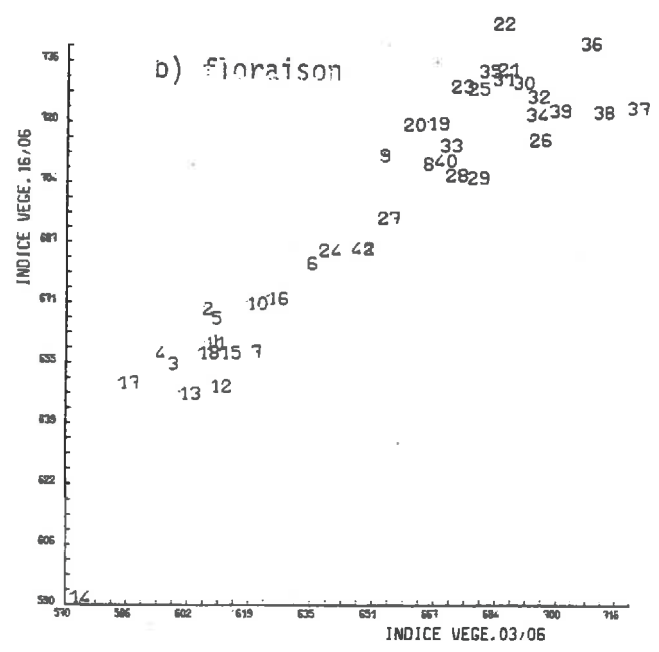
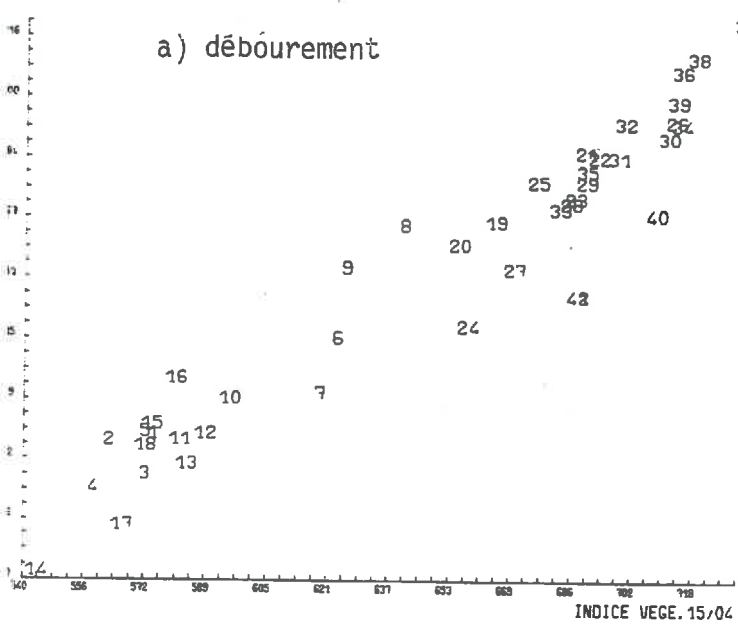


Figure 15 EVOLUTION DE L'INDICE DE VEGETATION DE LA VIGNE

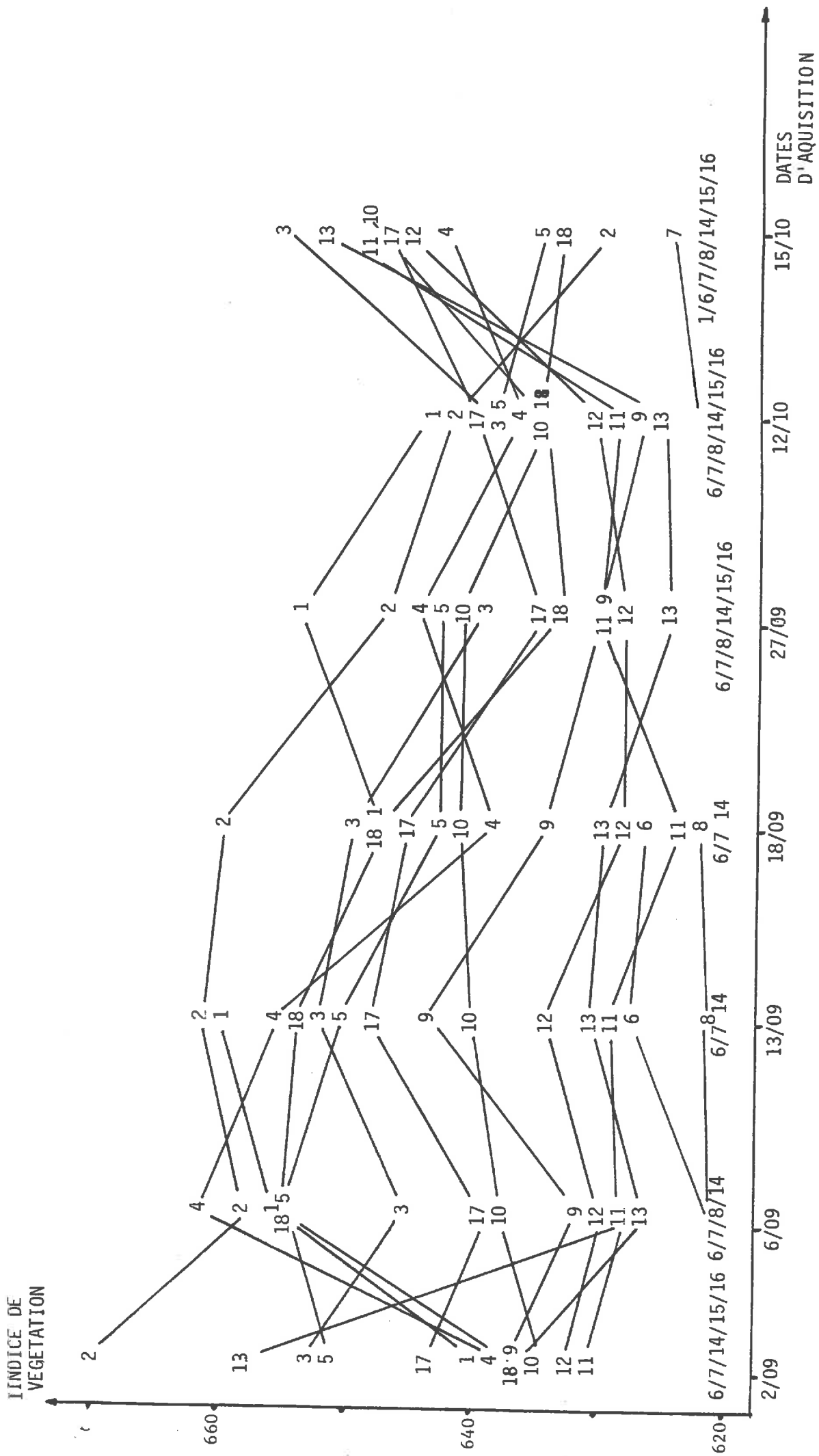
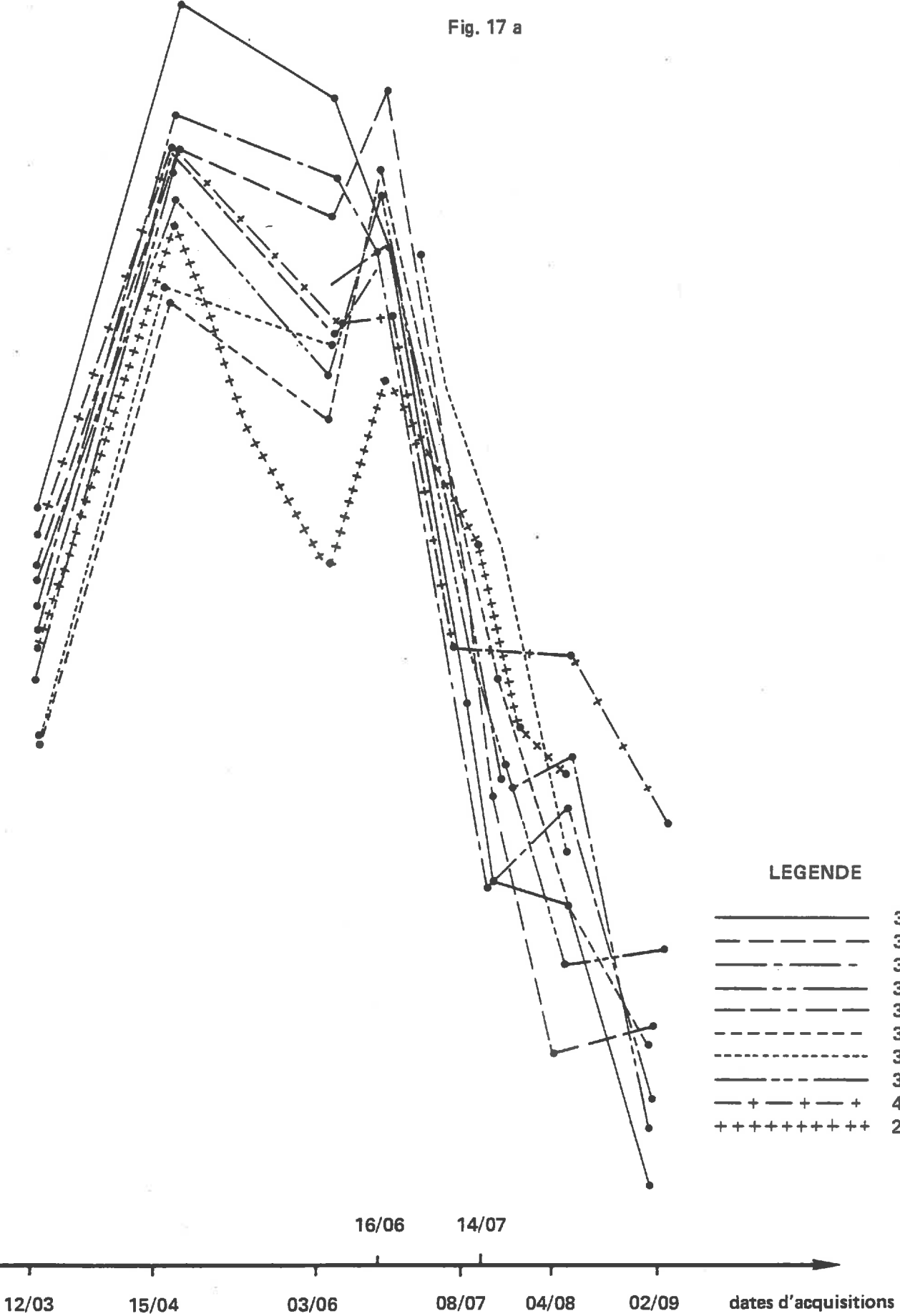


FIGURE 16 SUIVI DE L'INDICE DE VEGETATION DES AIRES MEDITERRANEENNES EN FIN DE CYCLE BIOLOGIQUE

indice
de végétation

SIGNATURES TEMPORELLES DES ASSOCIATIONS D'ESPECES
CEREALES DOMINANTES ET TOURNESOL

Fig. 17 a



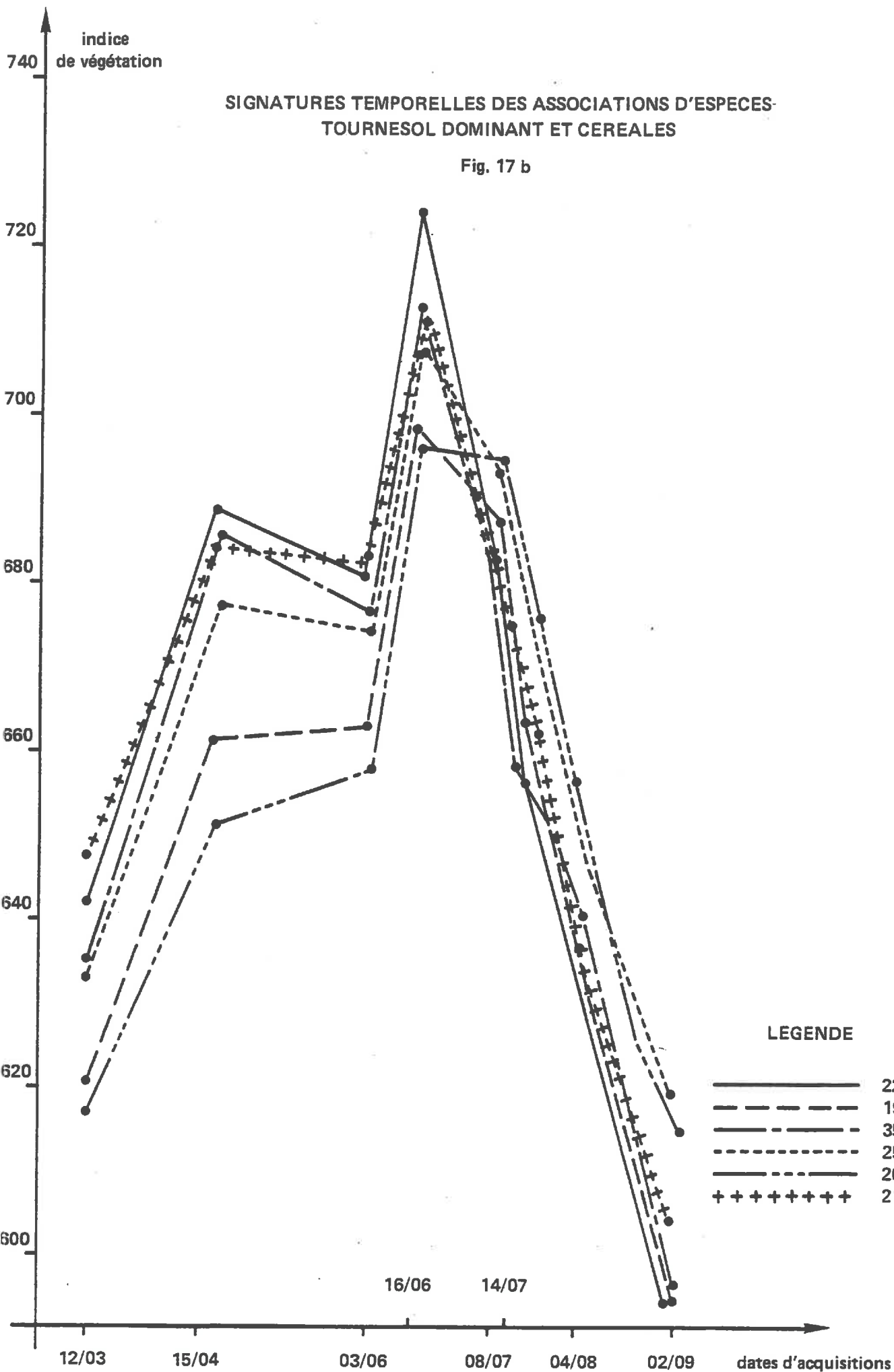
LEGENDE

- 37
- - - - - 36
- - - - - 38
- - - - - 39
- - - - - 34
- - - - - 31
- - - - - 32
- 30
- + - + - + 40
- + + + + + 26

indice
de végétation

SIGNATURES TEMPORELLES DES ASSOCIATIONS D'ESPECES
TOURNESOL DOMINANT ET CEREALES

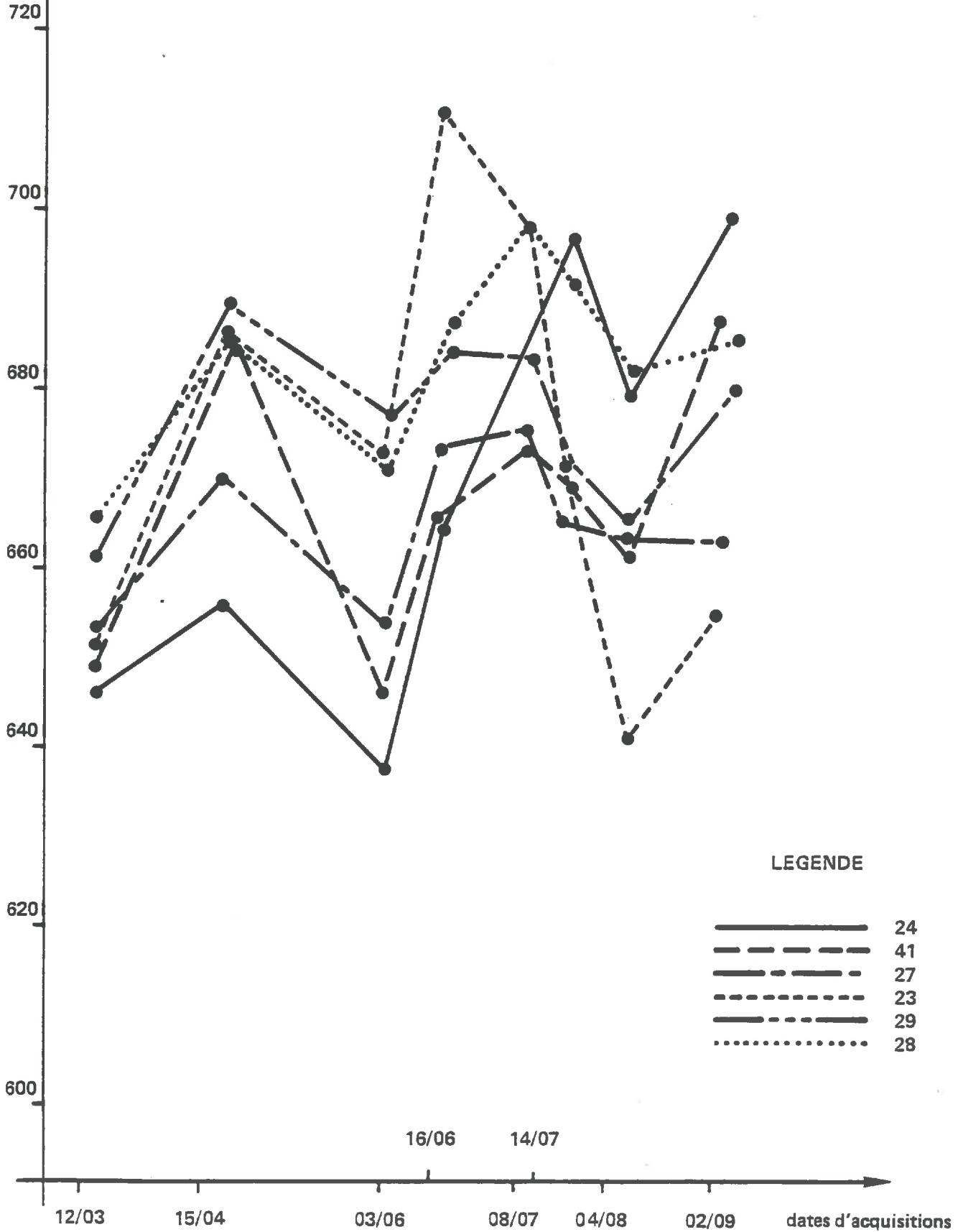
Fig. 17 b



indice
de végétation

SIGNATURES TEMPORELLES DES ASSOCIATIONS D'ESPECES
TOURNESOL, MAIS/SORGHO ET CEREALES

Fig. 17 c



%d'occupation du sol en céréales

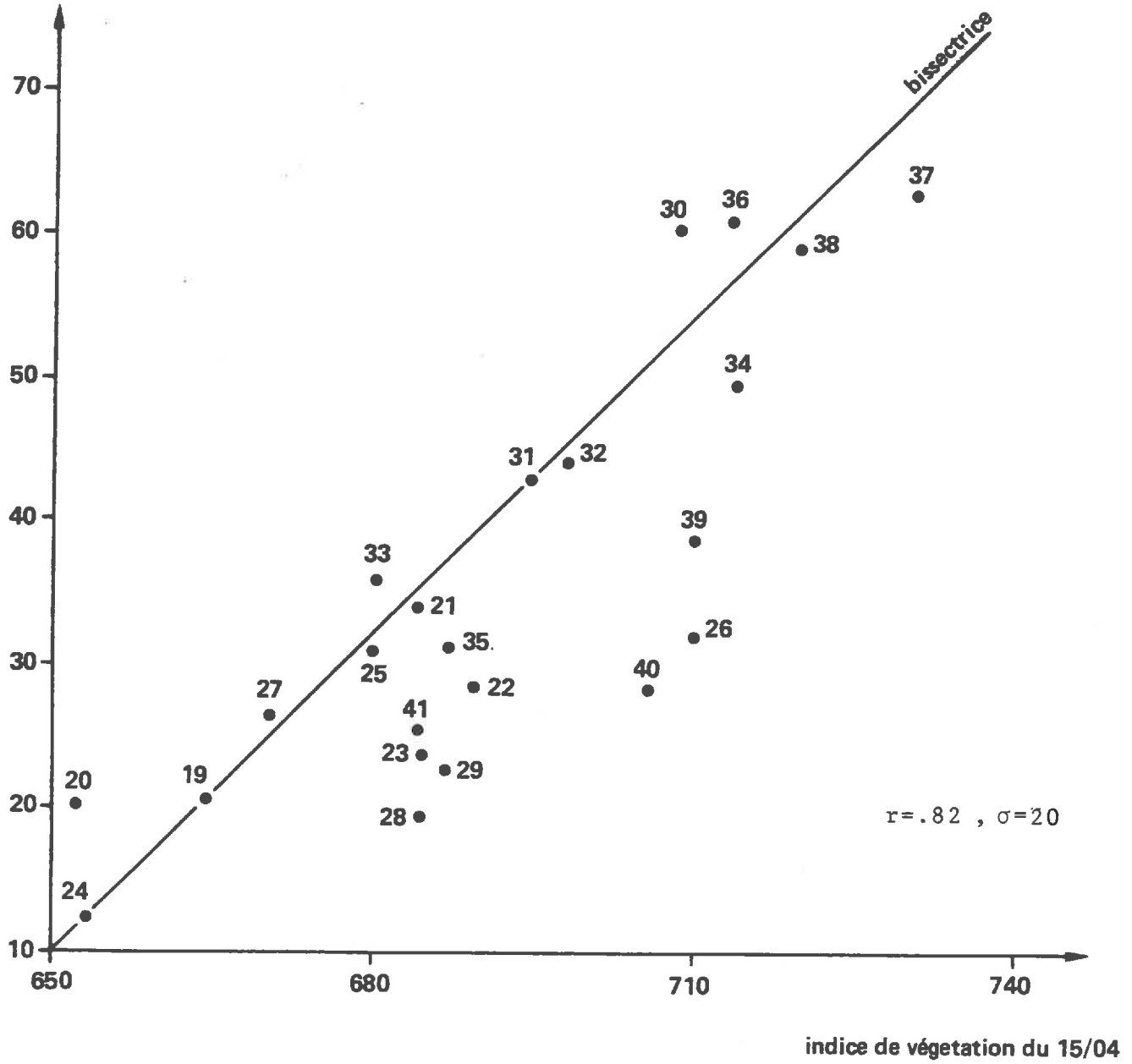


Figure 18a MISE EN RELATION DE L' I. V. DU 15 AVRIL
ET DE L'OCCUPATION DU SOL EN CEREALES

%d'occupation du sol en céréales et prairies

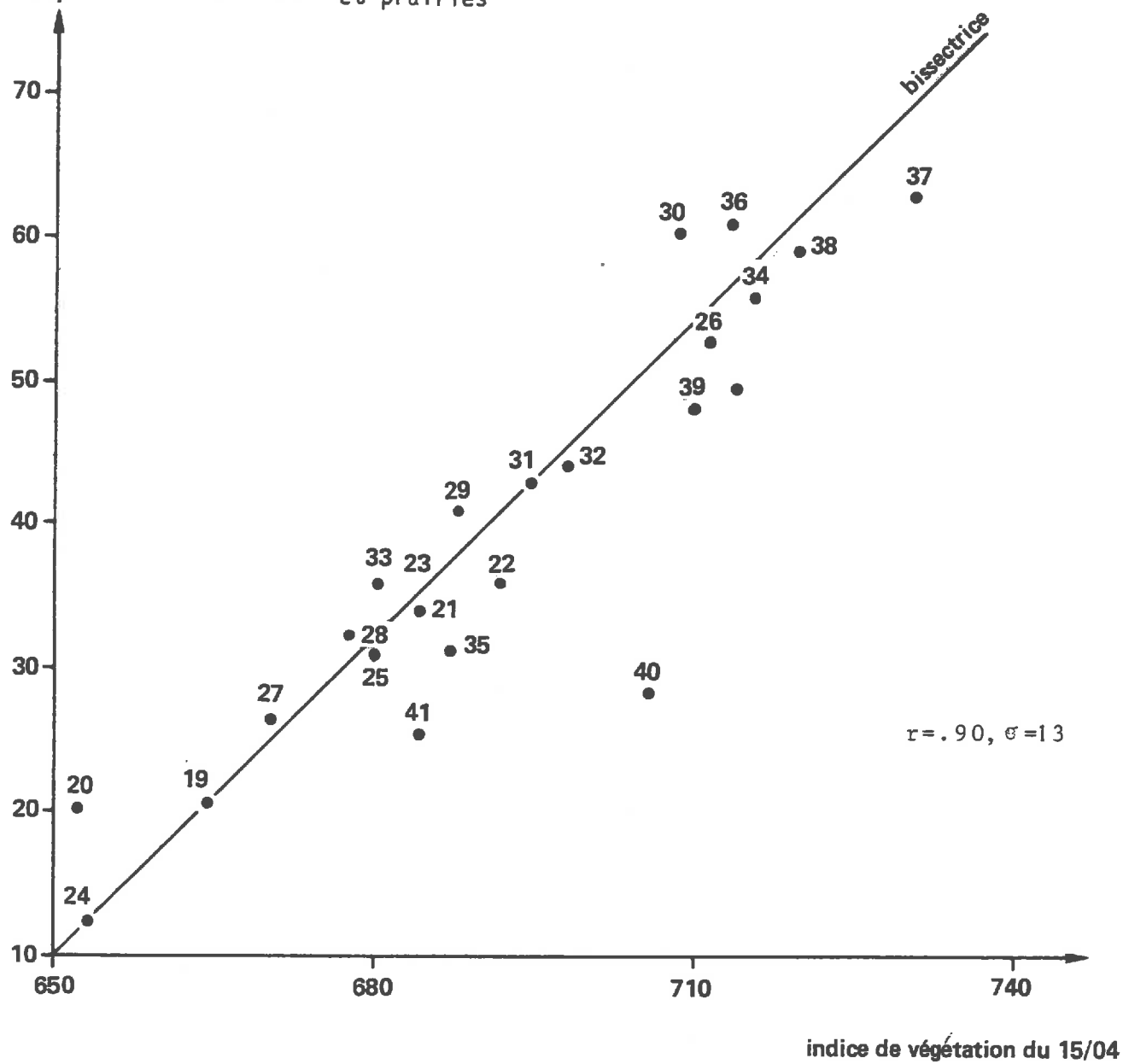
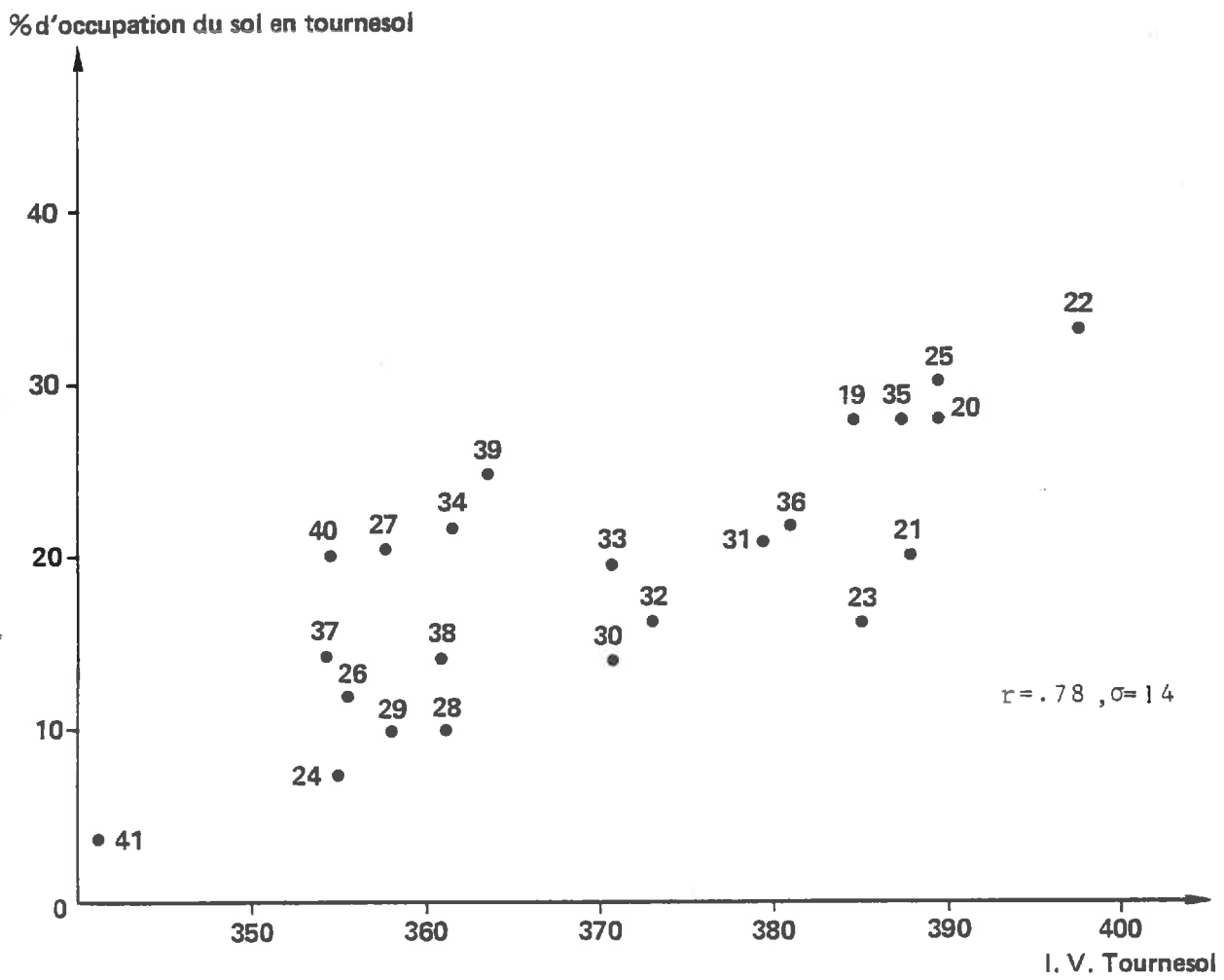


Figure 18b MISE EN RELATION DE L' I. V. DU 15 AVRIL
ET DE L'OCCUPATION DU SOL EN CEREALES
ET PRAIRIES



Par définition

$$I. V. \text{ Tournesol} = \frac{I. V. 16/06 - I. V. 15/04}{2}$$

Figure 19 : TRAITEMENT APPROPRIE A LA DETERMINATION DE L'OCCUPATION DU SOL EN TOURNESOL

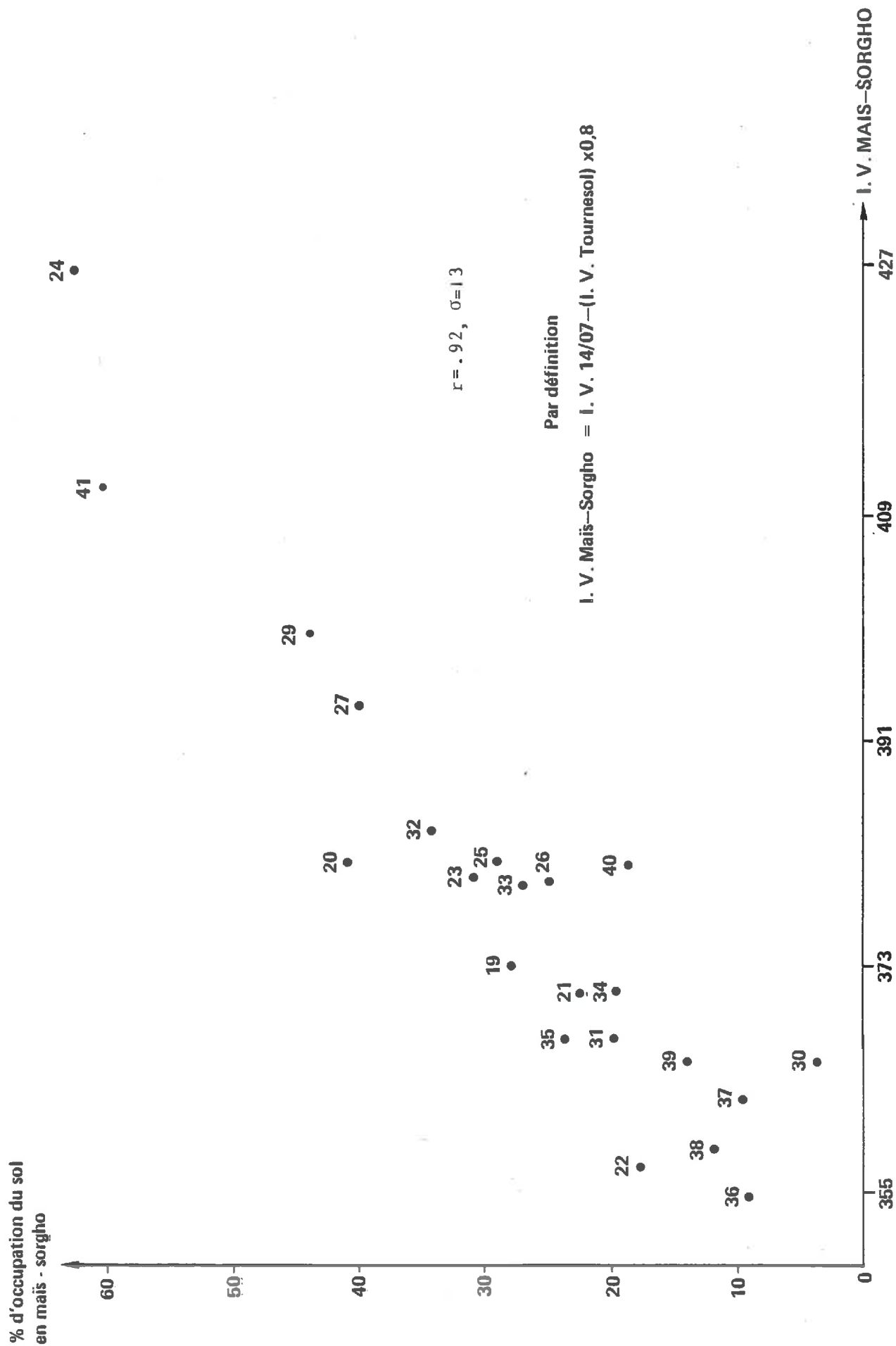
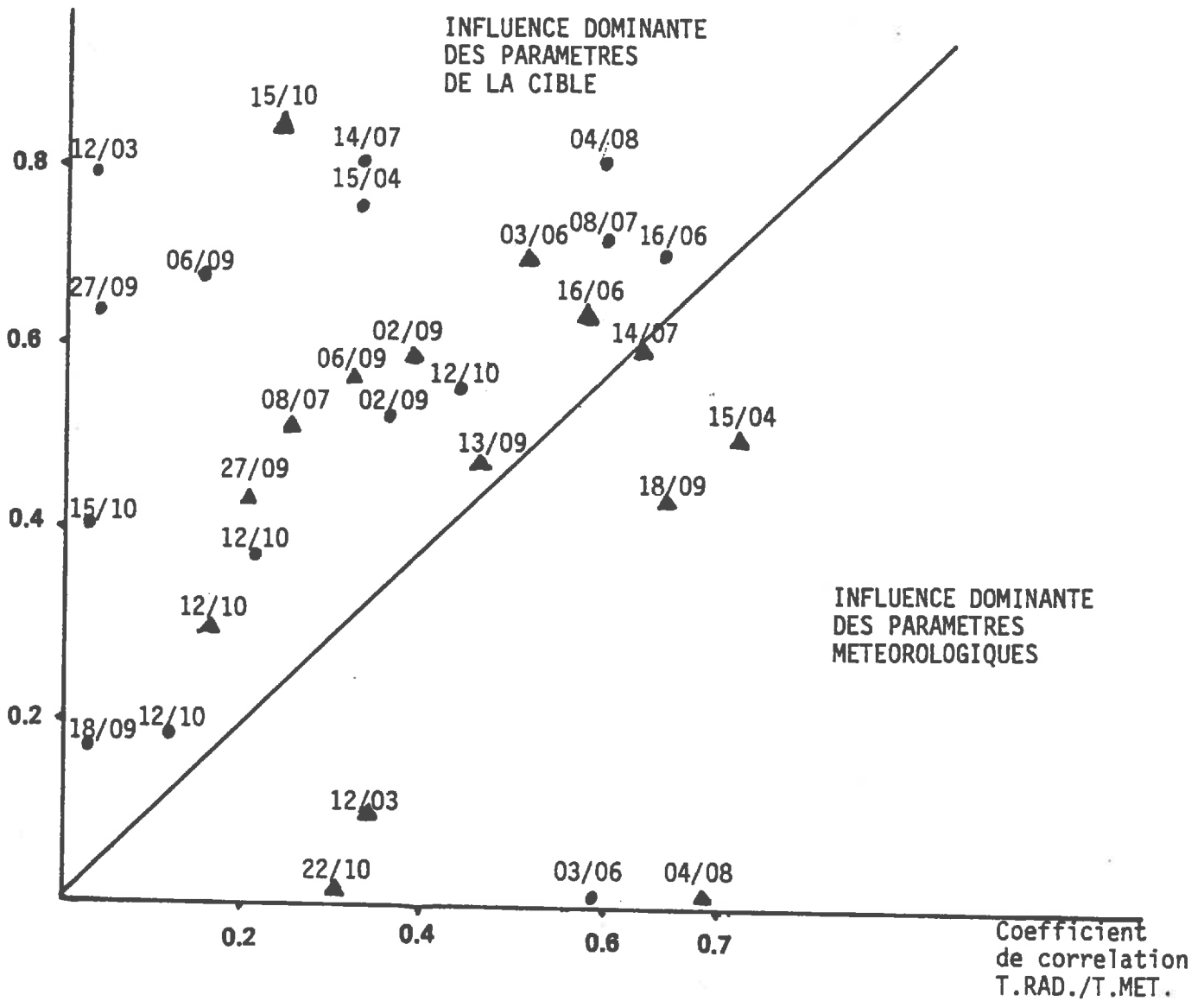


Figure 20 : TRAITEMENT APPROPRIÉ A LA DÉTERMINATION DE L'OCCUPATION DU SOL EN MAÏS-SORGHO

Coefficient
de corrélation
I.V./T.RAD.



- ▲ Aires méditerranéennes
- Aires océaniques

FIGURE 21 CARACTERISATION DES IMAGES SELON L'INFLUENCE DES PARAMETRES
DE LA CIBLE ET METEOROLOGIQUES

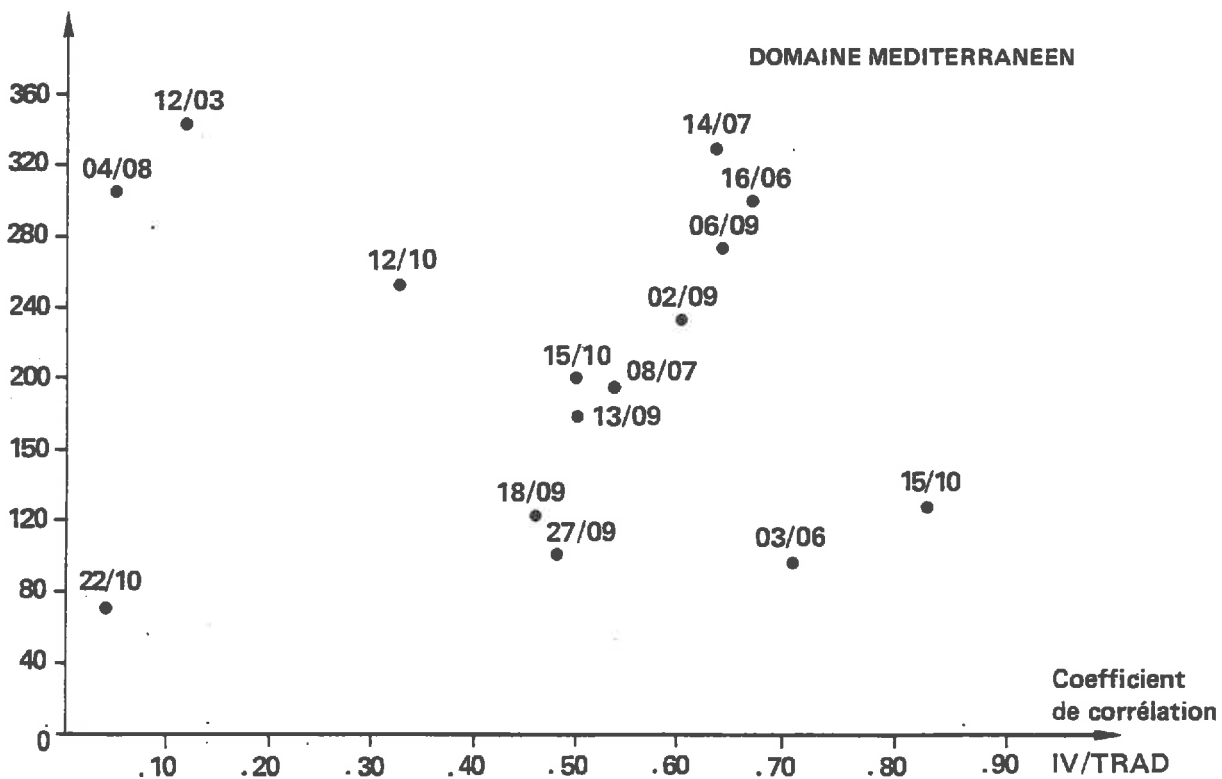
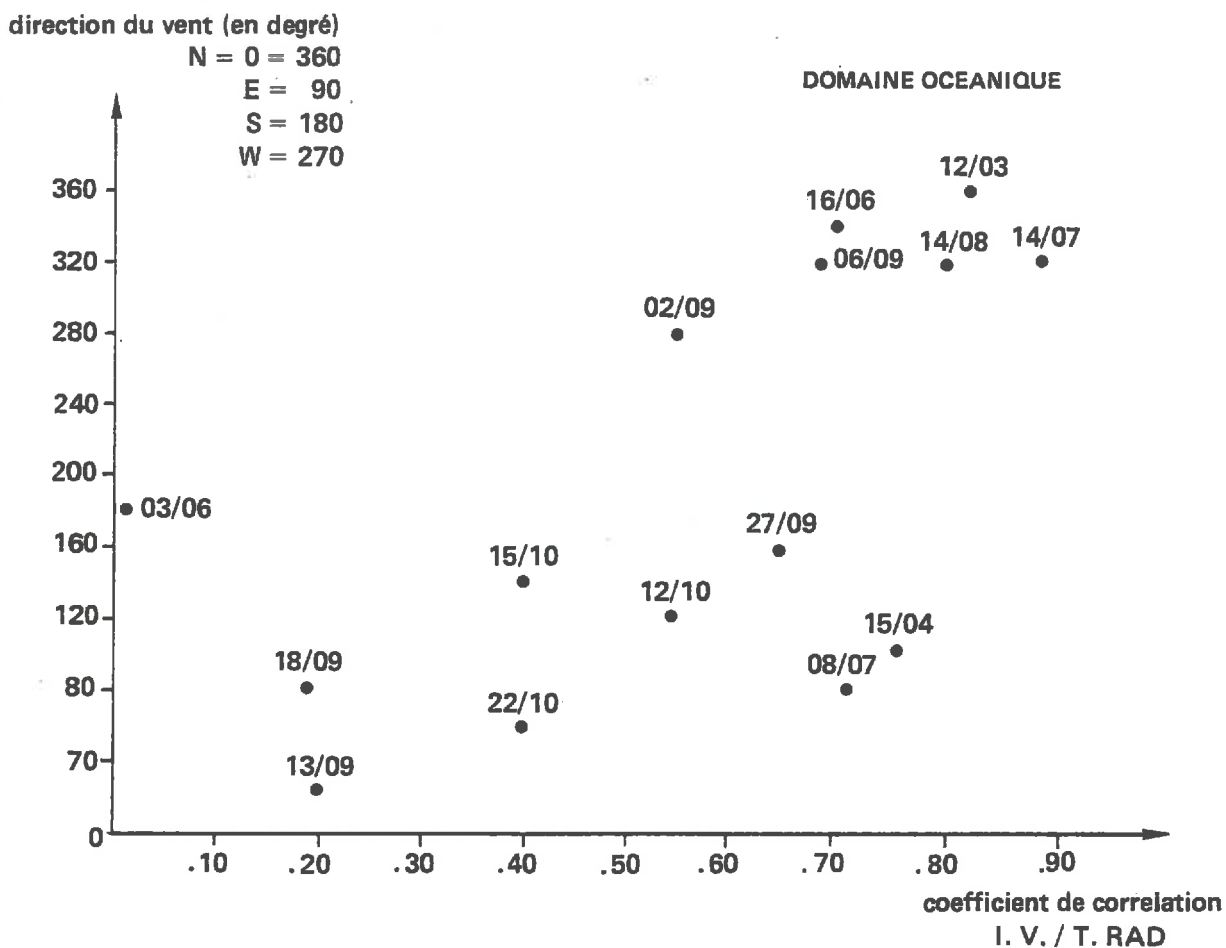


Figure 22 : INFLUENCE DU VENT SUR LA TEMPERATURE RADIOMETRIQUE
 a) DIRECTION DANS LES 2 DOMAINES D'ETUDE

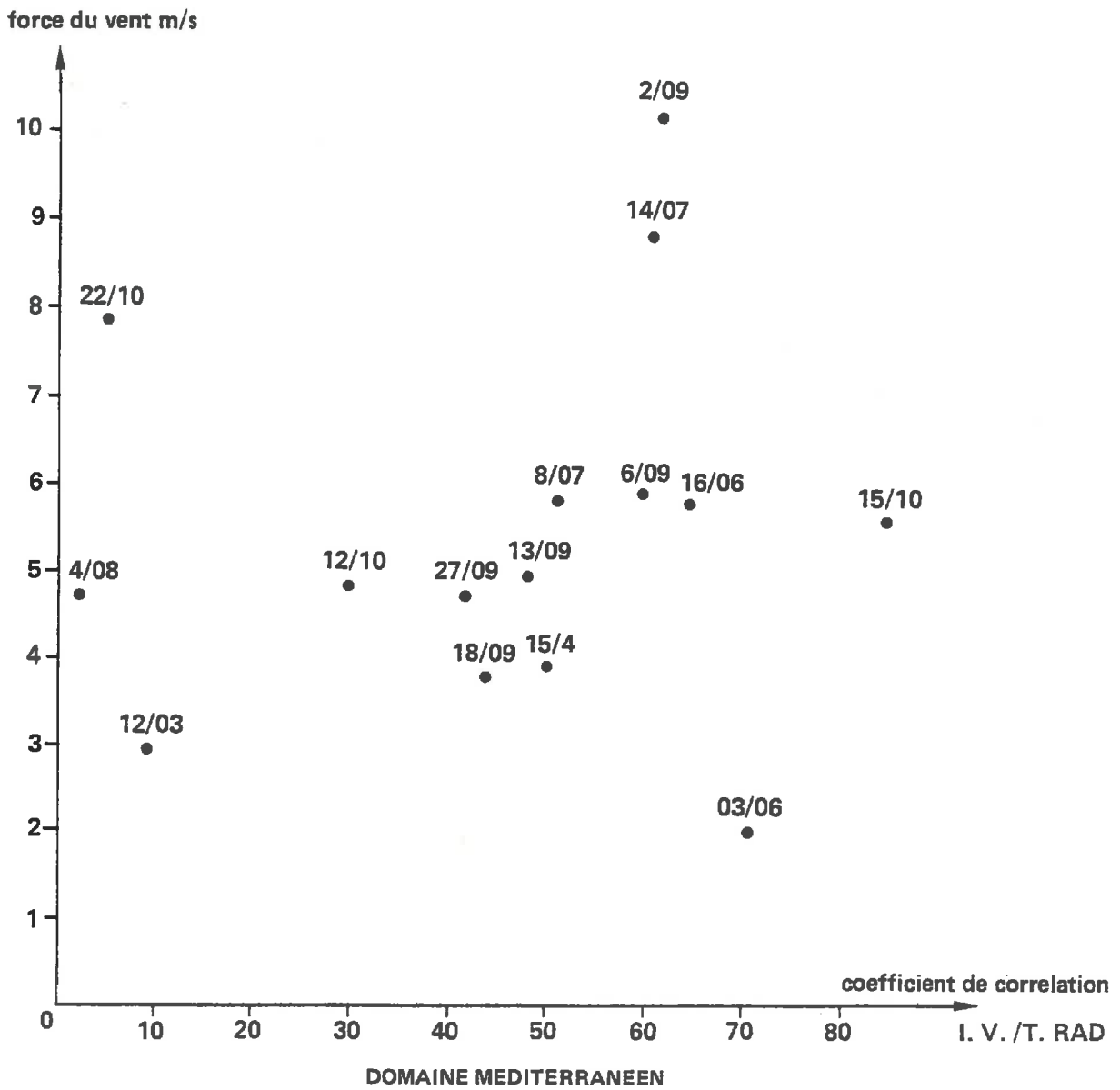


Figure 22 : INFLUENCE DU VENT SUR LA TEMPERATURE RADIOMETRIQUE
b) VITESSE

amplitude spatiale
de la température de l'air

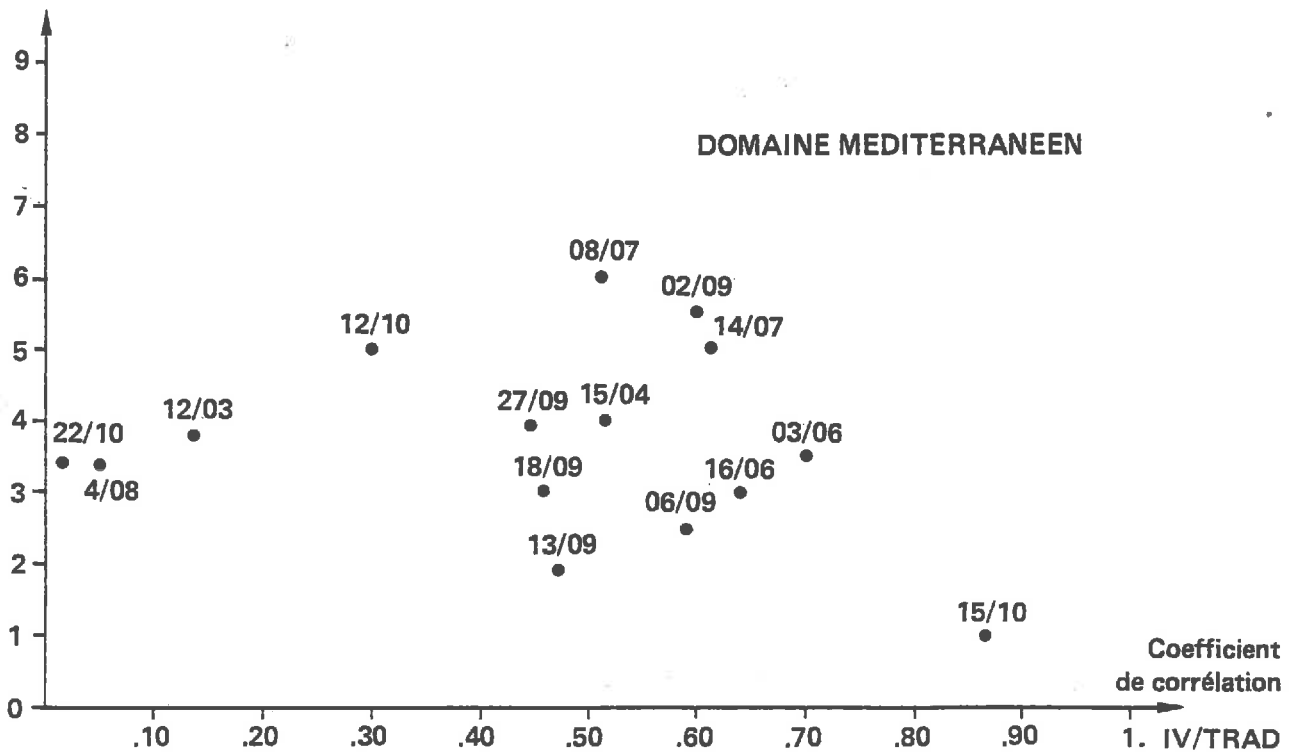
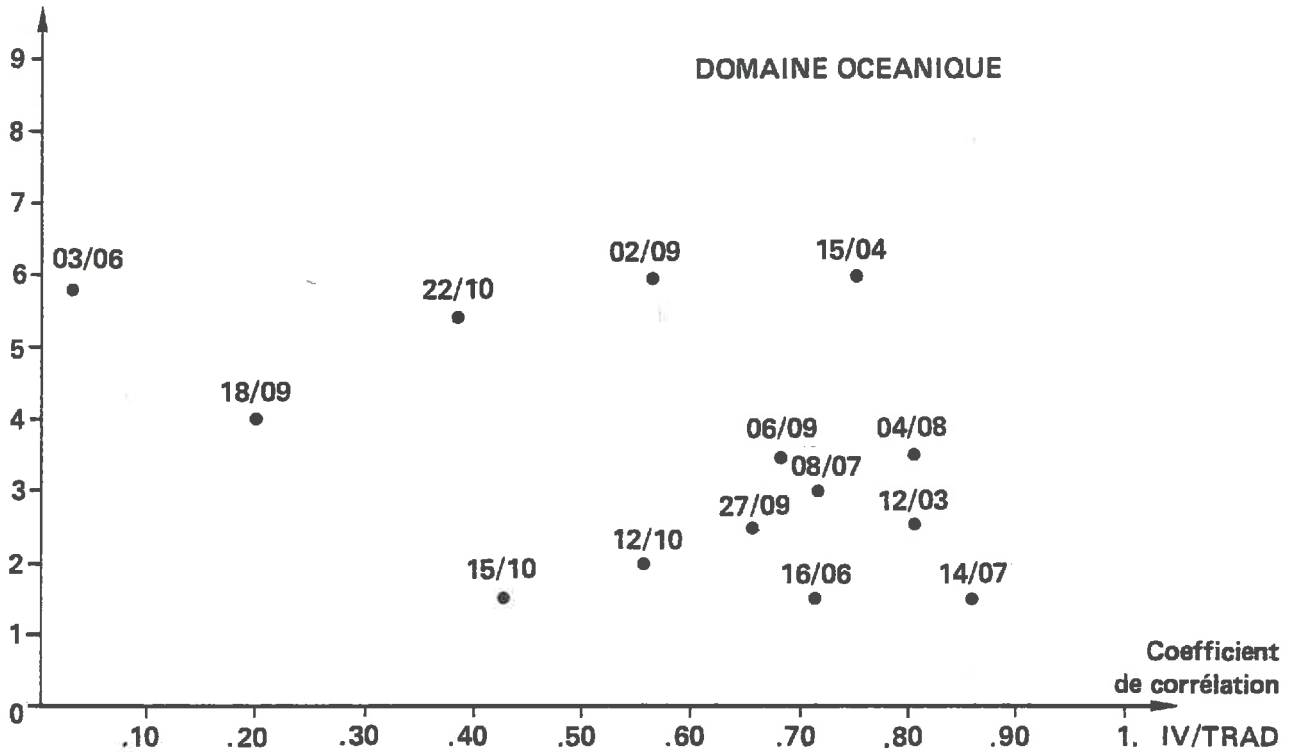


Figure 23 : INFLUENCE DE L'AMPLITUDE SPATIALE DE LA TEMPERATURE DE L'AIR SUR LA TEMPERATURE RADIOMETRIQUE

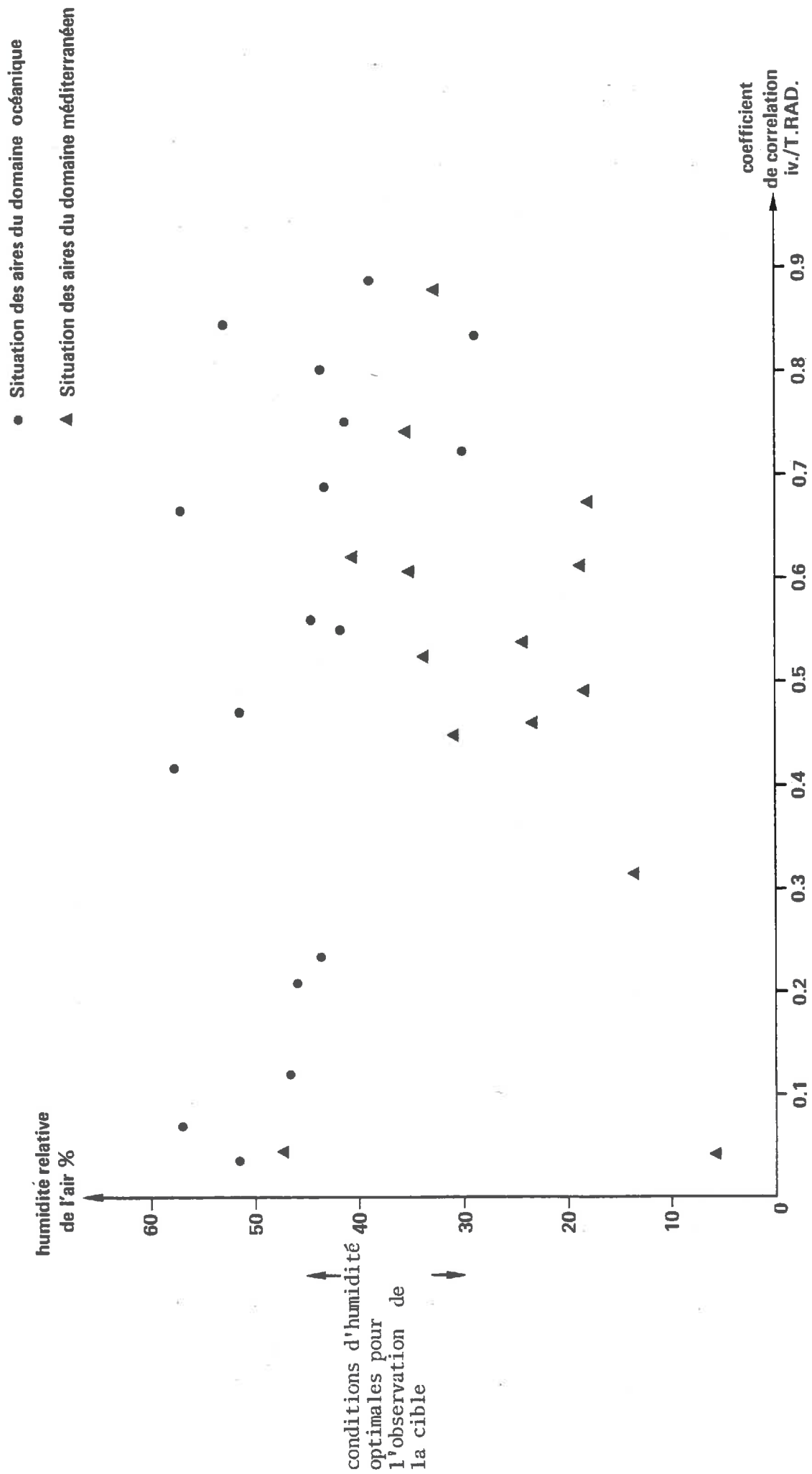


Figure 24 : INFLUENCE DE L'HUMIDITE RELATIVE DE L'AIR SUR LA TEMPERATURE RADIOMETRIQUE

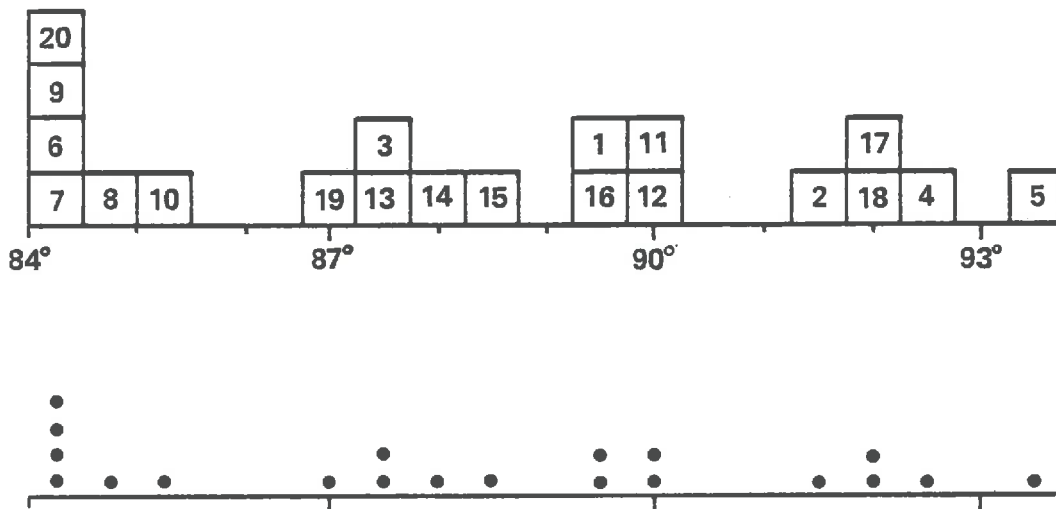


Figure 25 : HISTOGRAMME DE REPARTITION DES AIRES MEDITERRANEENNES SELON LA TEMPERATURE RADIOMETRIQUE CUMULEE (3 images de flux d'ouest)

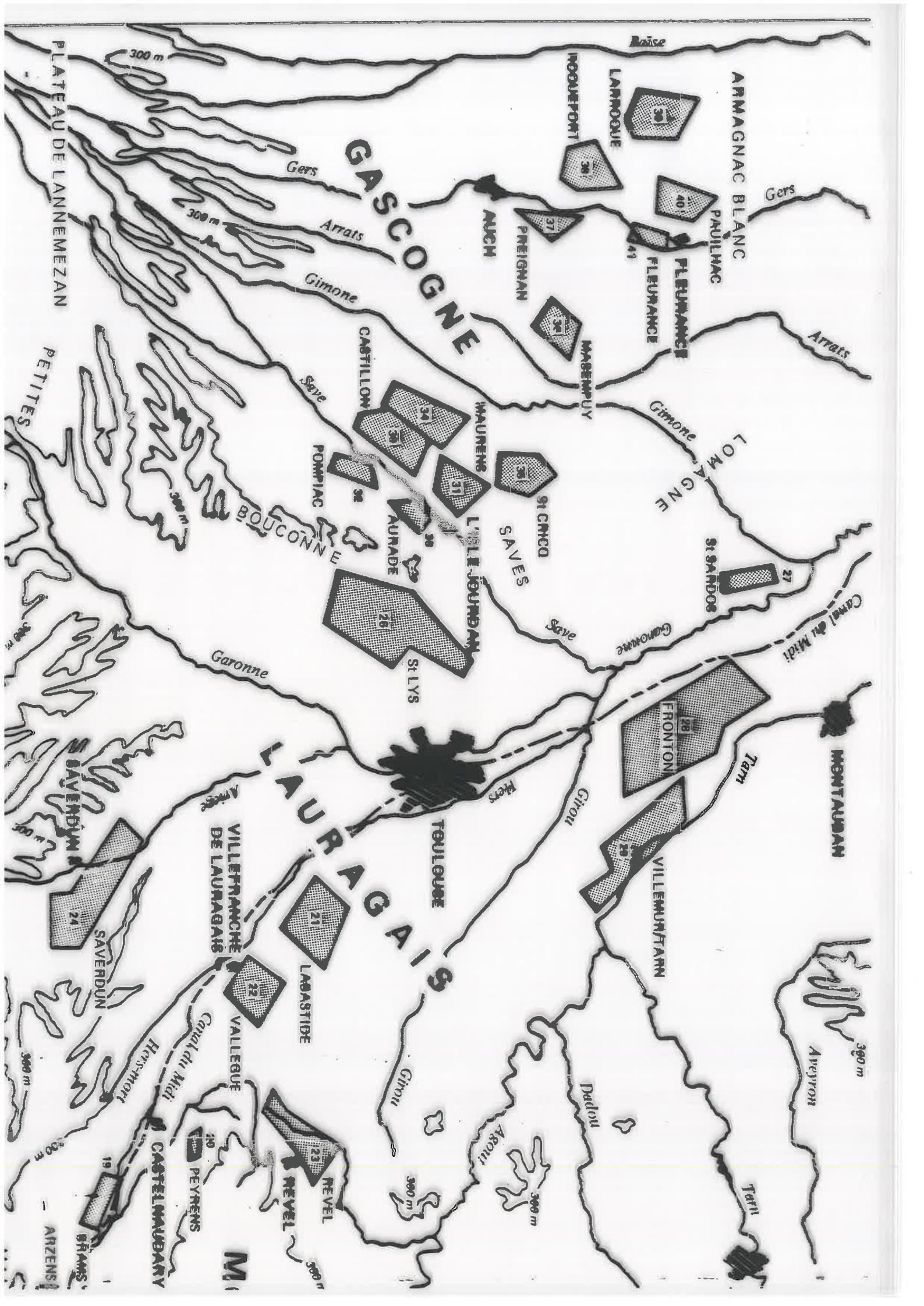


FIGURE 26 : Occupation du sol en CEREALES.

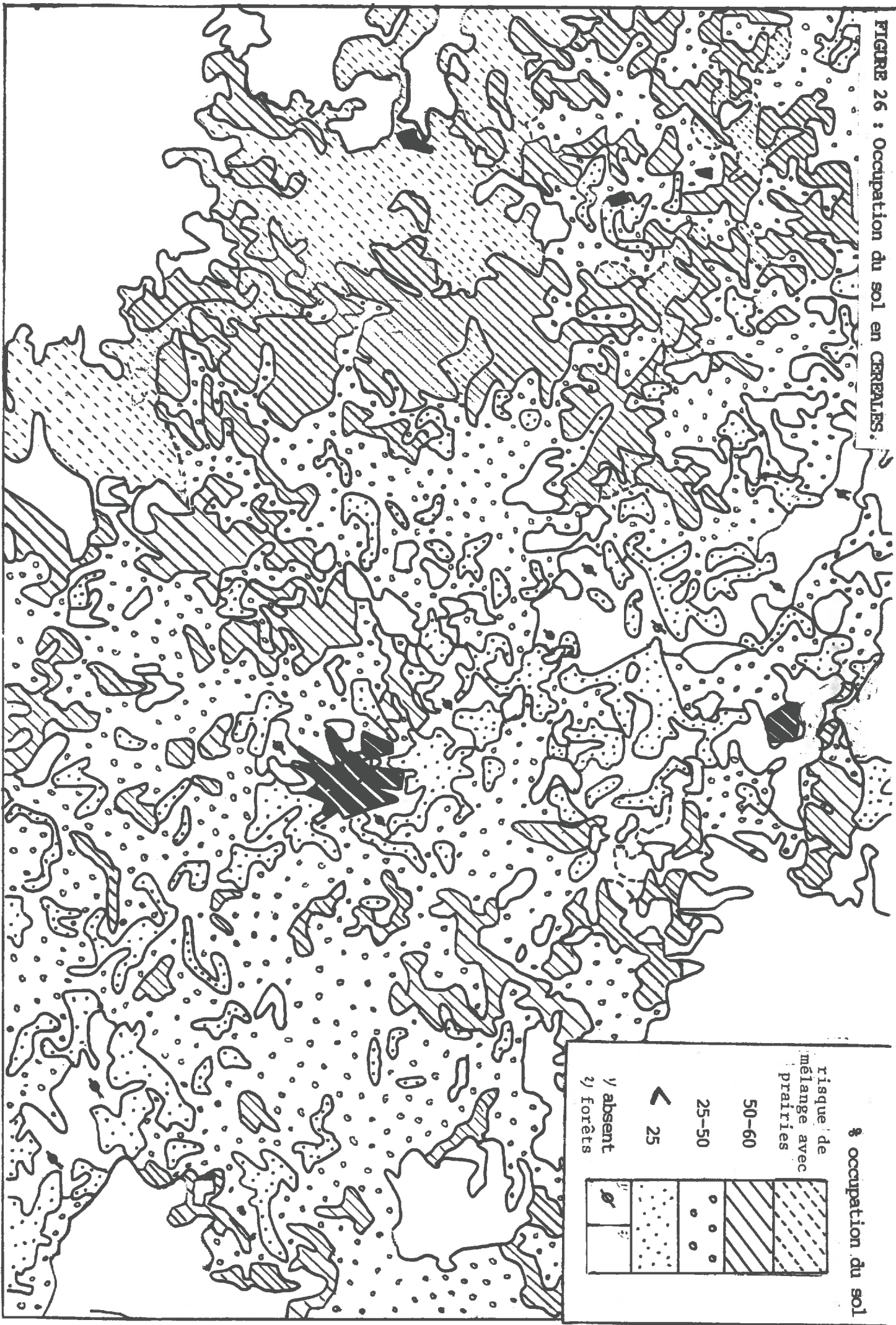
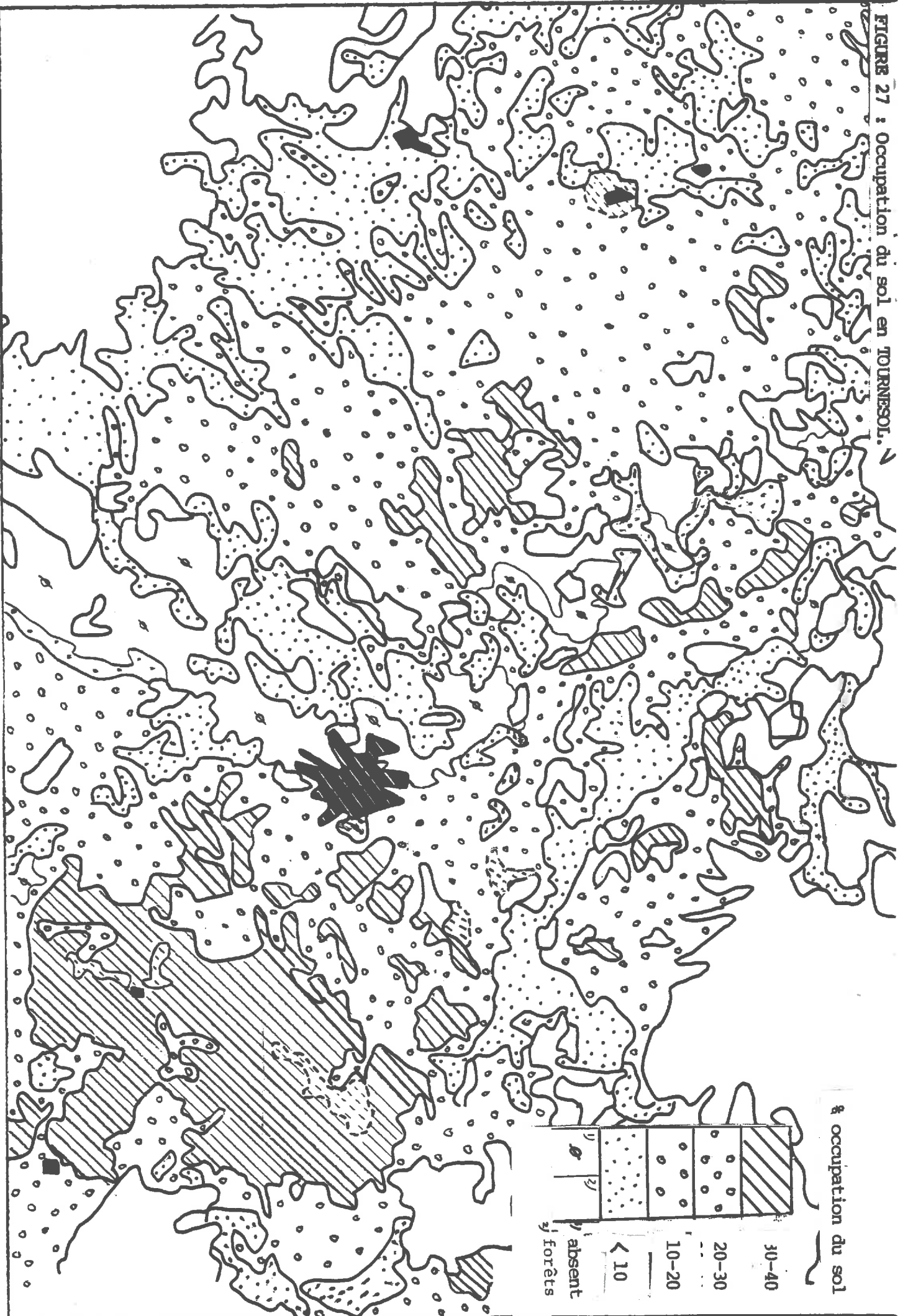


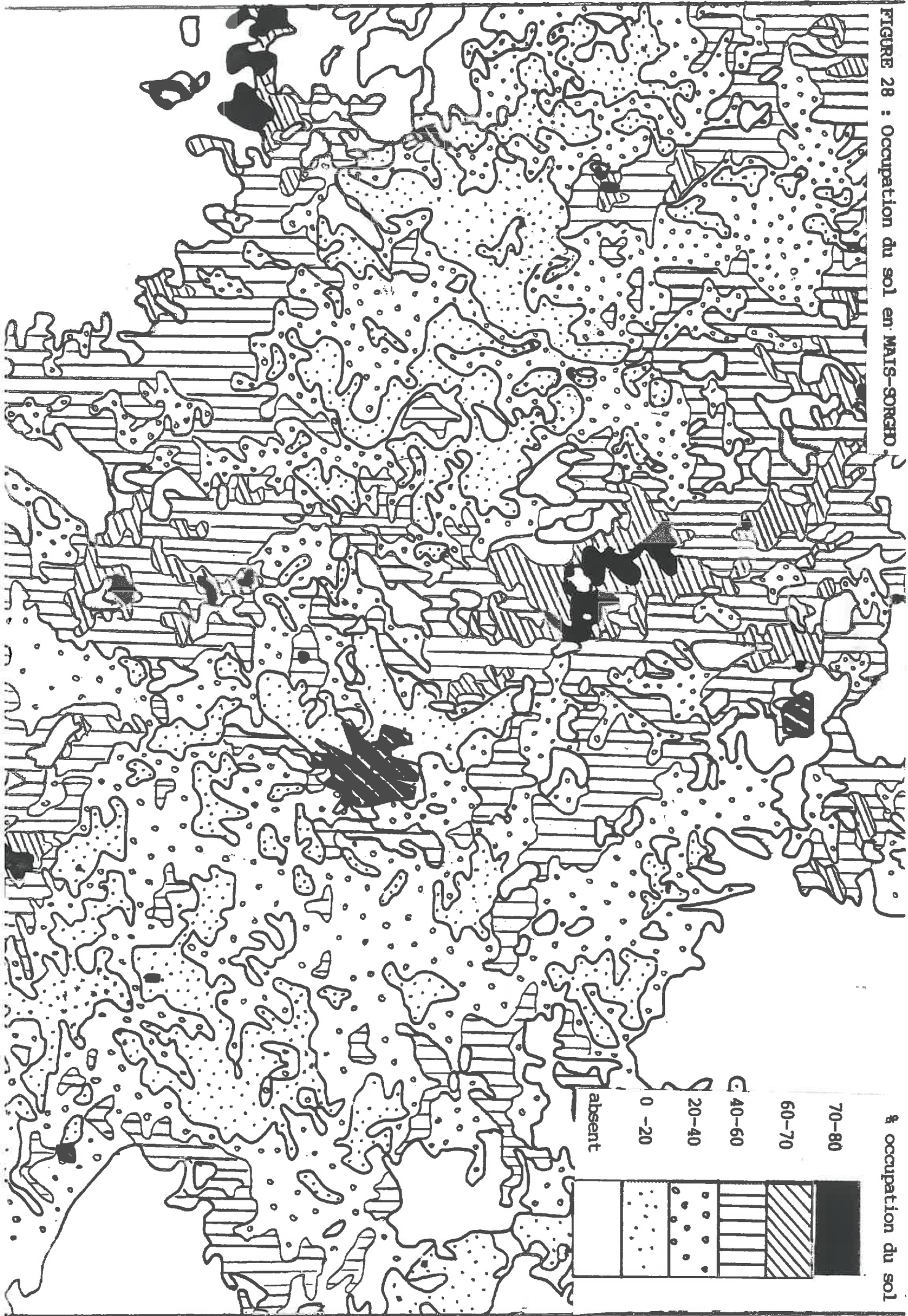
FIGURE 27 : Occupation du sol en TOURNESOL.



à occupation du sol

30-40
20-30
10-20
< 10
absent
forêts

FIGURE 28 : Occupation du sol en MAÏS-SORGHO



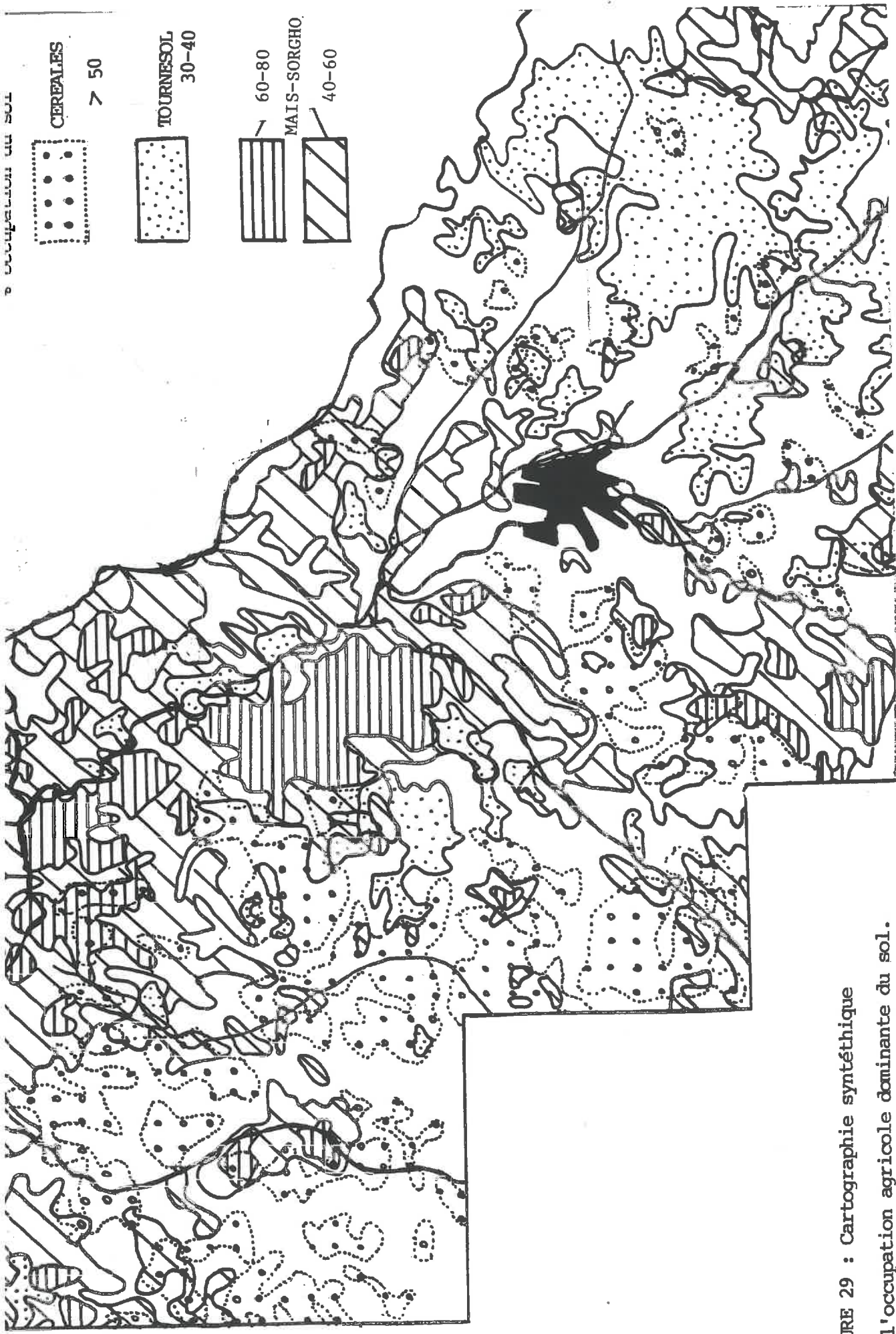
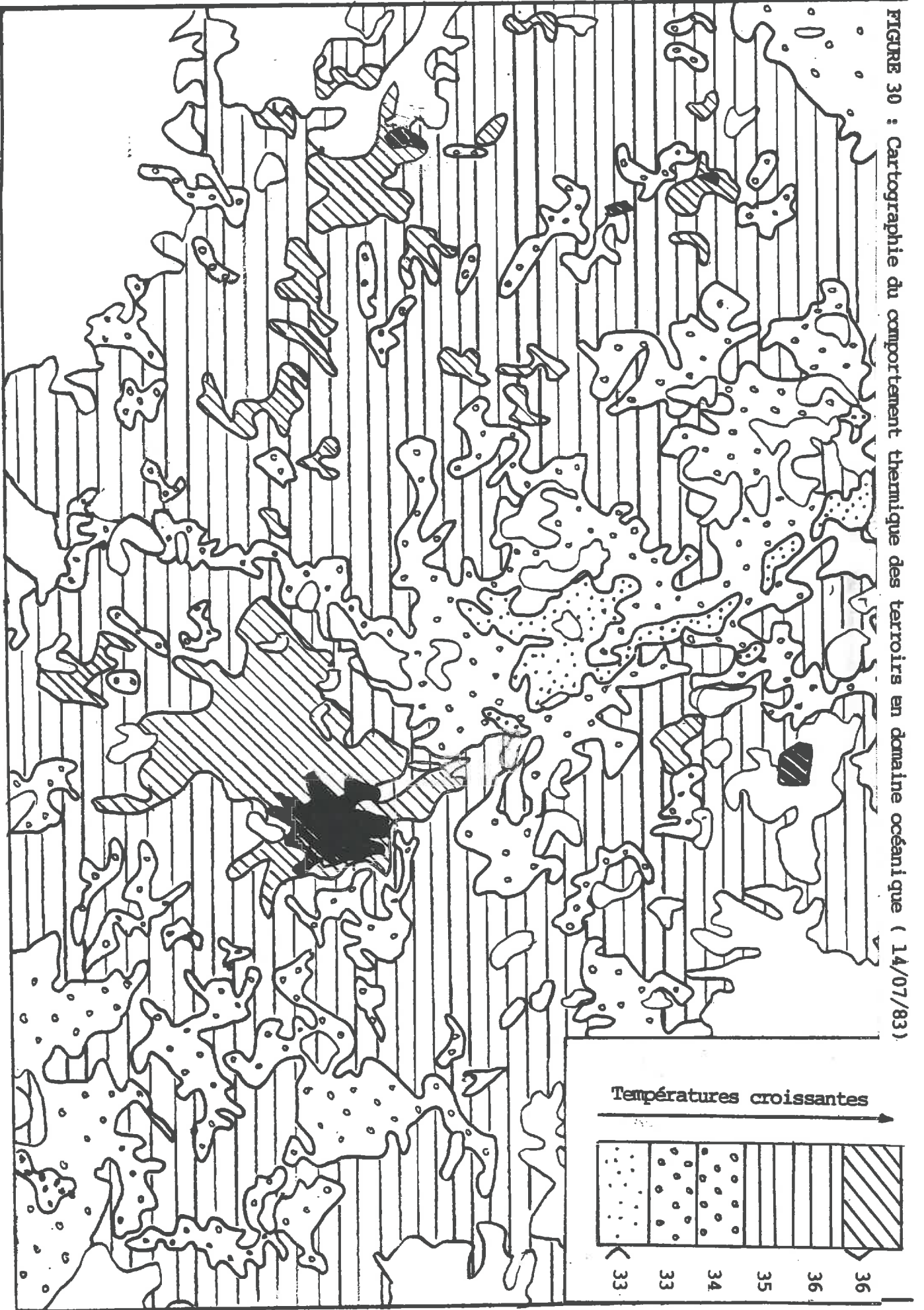
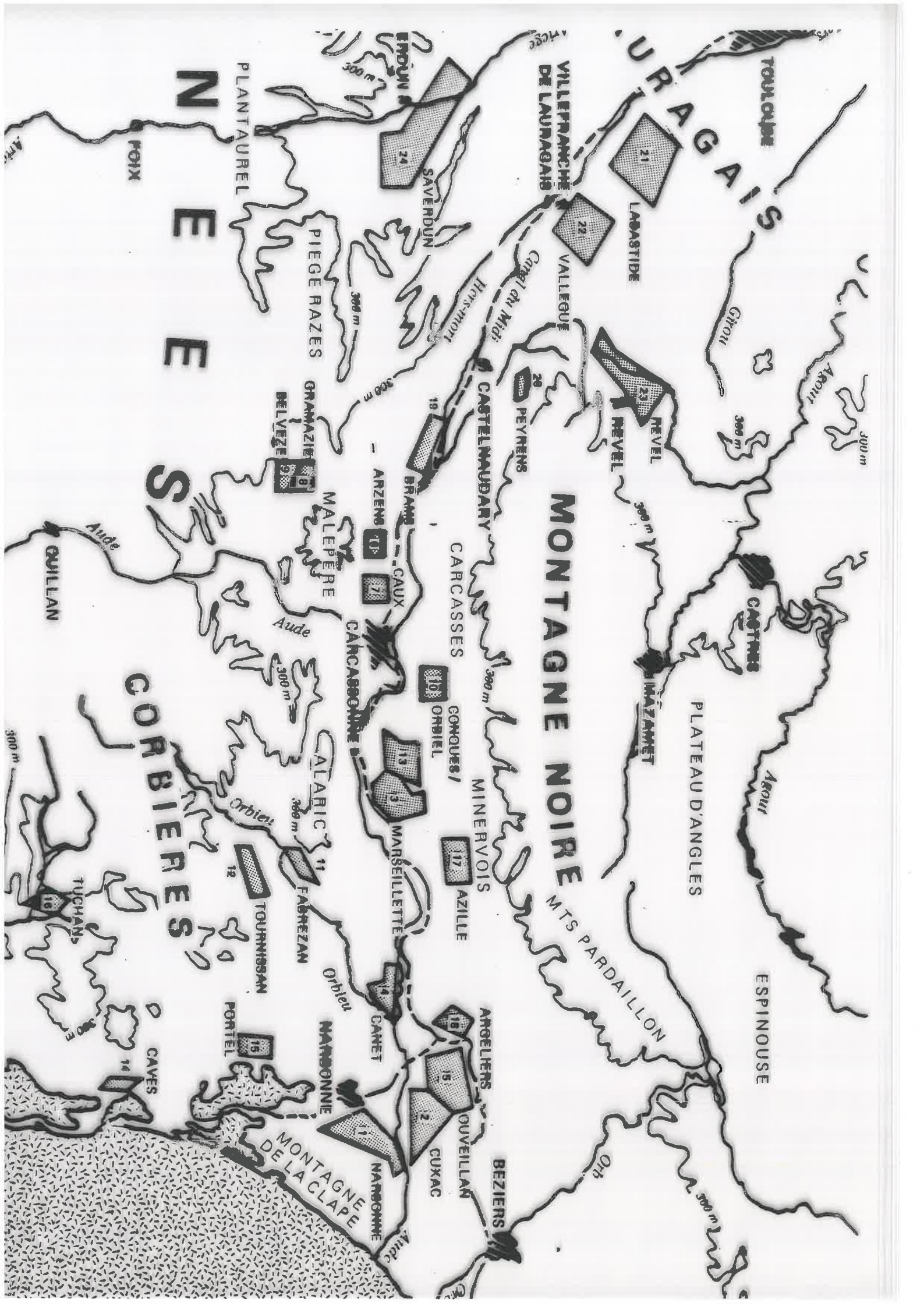


FIGURE 29 : Cartographie synthétique
 de l'occupation agricole dominante du sol.

FIGURE 30 : Cartographie du comportement thermique des terroirs en domaine océanique (14/07/83)





N
E
E
S

MONTAGNE NOIRE

URAGAIS

CORBIERES

Mts Pardaillon

PLATEAU D'ANGLES

MONTAGNE DE LA CLAPE

ESPINOUSE

FOIX

PLANTAUREL

PIEGE RAZES

GRAMAZIE

MALEPERE

ALARIC

FABREZAN

TOURNISSAN

PORTEL

NARBONNE

NARBONNE

ENDUN

24

SAVERDUN

Hiers-mort

19

BRAM

ARZENS

GAUX

3

MARSAILLETTE

14

CANET

11

NARBONNE

VILLEFRANCHE DE LAURAGAIS

22

VALLEGUE

20

PEYRENS

CASTELNAUDARY

CARCASSES

300 m

10

ORBIEL

17

AZILLE

MINERVOIS

13

CONQUES /

21

LABASTIDE

23

NEVEL

300 m

MAZANET

CASTRES

AROU

PLATEAU D'ANGLES

300 m

ESPINOUSE

300 m

AROU

Touloze

300 m

AROU

300 m

AROU

300 m

AROU

300 m

AROU

300 m

AROU

300 m

AROU

ALT.

Aude

GUILLAN

300 m

TUCHAN

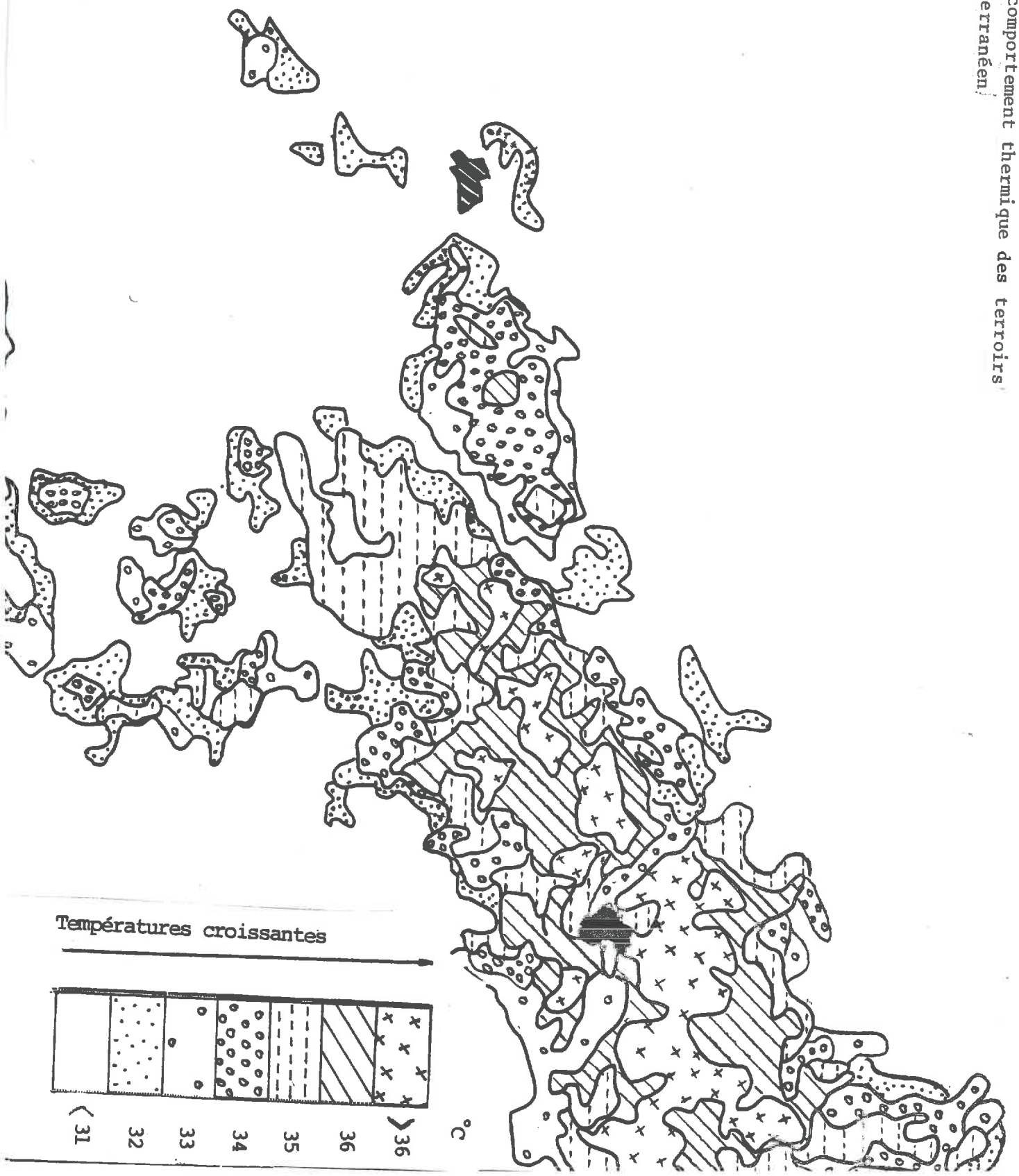
300 m

CAVES

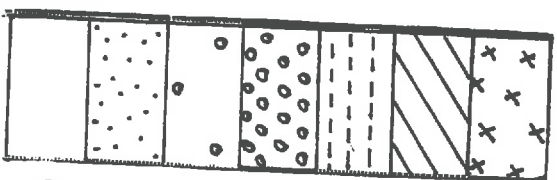
300 m

300 m

FIGURE 31 : Cartographie du comportement thermique des terroirs en domaine méditerranéen

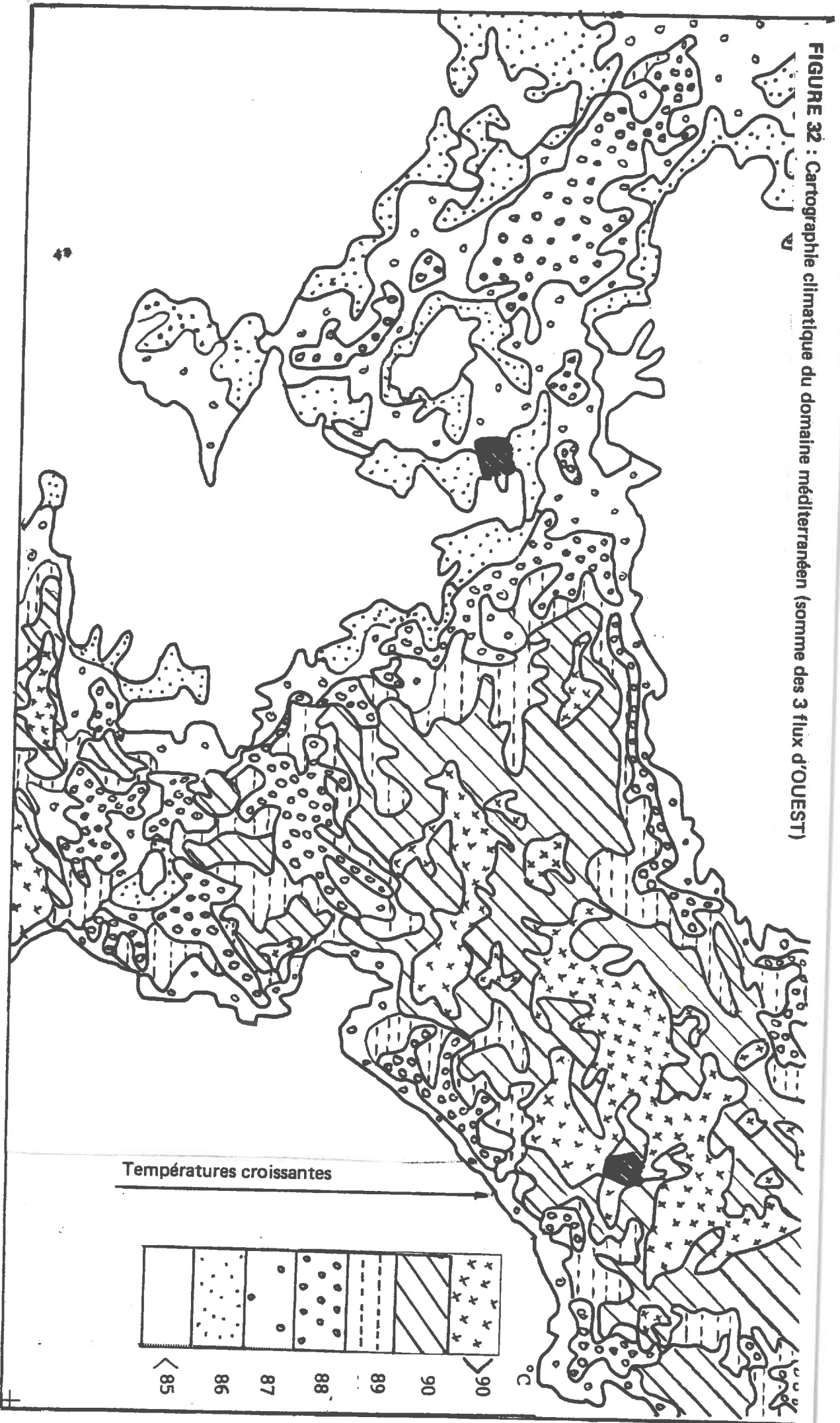


Températures croissantes



< 31 32 33 34 35 36 36 °C

FIGURE 32 : Cartographie climatique du domaine méditerranéen (somme des 3 flux d'OUEST)



ANALYSE DE L'ESPACE AGRICOLE PAR INTERPRETATION D'IMAGES SATELLITE NOAA

Suivi des cultures et étude de paramètres bioclimatiques,
du Languedoc à la Gascogne

Isabelle ANGLADE

figures



Thèse présentée pour le Doctorat de 3e Cycle

H. TH 2.2

AVRIL 1985