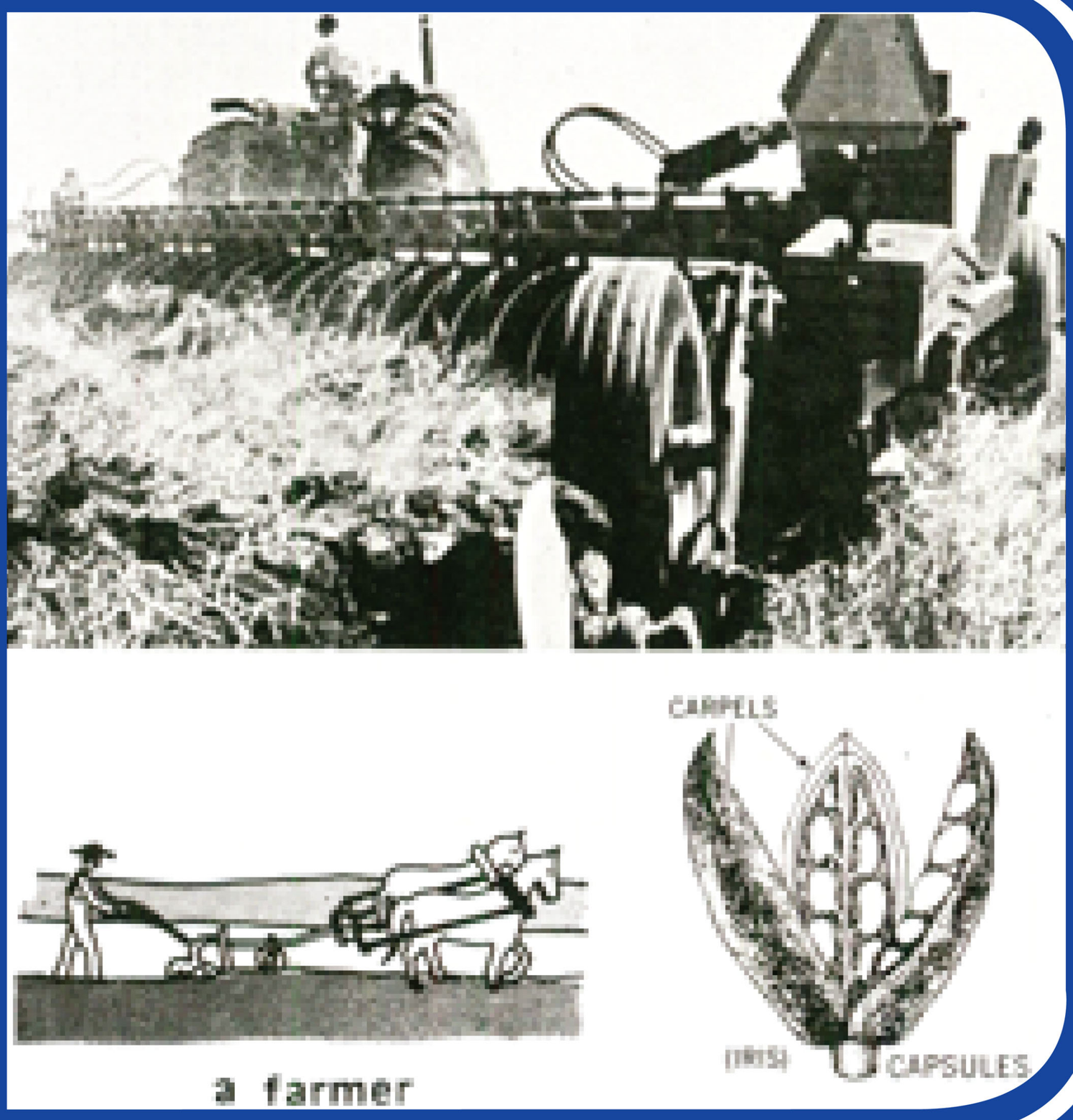
ΙΔΡΥΜΑ ΕΥΓΕΝΙΔΟΥ
1954

ΕΙΔΙΚΑ ΑΓΓΛΙΚΑ

ΓΙΑ ΤΜΗΜΑΤΑ γεωπονίας

Γ. Σ. Μουζακίτη

ΚΑΘΗΓΗΤΟΥ Α.Σ.Ε.Τ.Ε.Μ. / Σ.Ε.Λ.Ε.Τ.Ε.



ΙΔΡΥΜΑ ΕΥΓΕΝΙΔΟΥ

ΧΡΥΣΟΥΝ ΜΕΤΑΛΛΙΟΝ ΑΚΑΔΗΜΙΑΣ ΑΘΗΝΩΝ

ΠΡΟΛΟΓΟΣ ΙΔΡΥΜΑΤΟΣ ΕΥΓΕΝΙΔΟΥ

Ὁ Εὐγένιος Εὐγενίδης, ὁ ἱδρυτής καί χορηγός τοῦ «Ἱδρύματος Εὐγενίδου», πολύ νωρίς πρόβλεψε καί σχημάτισε τήν πεποίθηση ὅτι ἡ ἄρτια κατάρτιση τῶν τεχνικῶν μας, σέ συνδυασμό μέ τήν ἐθνική ἀγωγή, θά ἦταν ἀναγκαῖος καί ἀποφασιστικός παράγοντας τῆς προόδου τοῦ Ἔθνους μας.

Τήν πεποίθησή του αὐτή ὁ Εὐγενίδης ἐκδήλωσε μέ τή γενναιόφρονα πράξη εὐεργεσίας, νά κληροδοτήσει σεβαστό ποσό γιά τή σύσταση Ἱδρύματος πού θά εἶχε σκοπό νά συμβάλλει στήν τεχνική ἐκπαίδευση τῶν νέων τῆς Ἑλλάδας.

Ἔτσι τό Φεβρουάριο τοῦ 1956 συστήθηκε τό «Ἵδρυμα Εὐγενίδου», τοῦ ὁποίου τήν διοίκηση ἀνέλαβε ἡ ἀδελφή του κυρία Μαριάνθη Σίμου, σύμφωνα μέ τήν ἐπιθυμία τοῦ διαθέτη.

Ἀπό τό 1956 μέχρι σήμερα ἡ συμβολή τοῦ Ἱδρύματος στήν τεχνική ἐκπαίδευση πραγματοποιεῖται μέ διάφορες δραστηριότητες. Ὅμως ἀπ' αὐτές ἡ σημαντικότερη, πού κρίθηκε ἀπό τήν ἀρχή ὡς πρώτης ἀνάγκης, εἶναι ἡ ἔκδοση βιβλίων γιά τούς μαθητές τῶν τεχνικῶν σχολῶν.

Μέχρι σήμερα ἐκδόθηκαν 150 τόμοι βιβλίων, πού ἔχουν διατεθεῖ σέ πολλά ἑκατομμύρια τεύχη, καί καλύπτουν ἀνάγκες τῶν Κατώτερων καί Μέσων Τεχνικῶν Σχολῶν τοῦ Ὑπ. Παιδείας, τῶν Σχολῶν τοῦ Ὀργανισμοῦ Ἀπασχολήσεως Ἐργατικοῦ Δυναμικοῦ (ΟΑΕΔ) καί τῶν Δημοσίων Σχολῶν Ἐμπορικοῦ Ναυτικοῦ.

Μοναδική φροντίδα τοῦ Ἱδρύματος σ' αὐτή τήν ἐκδοτική του προσπάθεια ἦταν καί εἶναι ἡ ποιότητα τῶν βιβλίων, ἀπό ἄποψη ὄχι μόνον ἐπιστημονική, παιδαγωγική καί γλωσσική, ἀλλά καί ἀπό ἄποψη ἐμφανίσεως, ὥστε τό βιβλίο νά ἀγαπηθεῖ ἀπό τούς νέους.

Γιά τήν ἐπιστημονική καί παιδαγωγική ποιότητα τῶν βιβλίων, τά κείμενα ὑποβάλλονται σέ πολλές ἐπεξεργασίες καί βελτιώνονται πρίν ἀπό κάθε νέα ἔκδοση.

Ἰδιαίτερη σημασία ἀπέδωσε τό Ἵδρυμα ἀπό τήν ἀρχή στήν ποιότητα τῶν βιβλίων ἀπό γλωσσική ἄποψη, γιατί πιστεύει ὅτι καί τά τεχνικά βιβλία, ὅταν εἶναι γραμμένα σέ γλώσσα ἄρτια καί ὁμοιόμορφη ἀλλά καί κατάλληλη γιά τή στάθμη τῶν μαθητῶν, μποροῦν νά συμβάλλουν στήν γλωσσική διαπαιδαγώγηση τῶν μαθητῶν.

Ἔτσι μέ ἀπόφαση πού πάρθηκε ἤδη ἀπό τό 1956 ὅλα τά βιβλία τῆς Βιβλιοθήκης τοῦ Τεχνίτη, δηλαδή τά βιβλία γιά τίς Κατώτερες Τεχνικές Σχολές, ὅπως ἀργότερα καί γιά τίς Σχολές τοῦ ΟΑΕΔ, εἶναι γραμμένα σέ γλώσσα δημοτική μέ βάση τήν γραμματική τοῦ Τριανταφυλλίδη, ἐνῶ ὅλα τά ἄλλα βιβλία εἶναι γραμμένα στήν ἁπλή καθαρεύουσα. Ἡ γλωσσική ἐπεξεργασία τῶν βιβλίων γίνεται ἀπό φιλολόγους τοῦ Ἱδρύματος καί ἔτσι ἐξασφαλίζεται ἡ ἐνιαία σύνταξη καί ὁρολογία κάθε κατηγορίας βιβλίων.

Ἡ ποιότητα τοῦ χαρτιοῦ, τό εἶδος τῶν τυπογραφικῶν στοιχείων, τά σωστά σχήματα καί ἡ καλαίσθητη σελιδοποίηση, τό ἐξώφυλλο καί τό μέγεθος τοῦ βιβλίου περιλαμβάνονται καί αὐτά στίς φροντίδες τοῦ Ἱδρύματος.

Τό Ἵδρυμα θεώρησε ὅτι εἶναι ὑποχρέωσή του, σύμφωνα μέ τό πνεῦμα τοῦ ἱδρυτή του, νά θέσει στήν διάθεση τοῦ Κράτους ὅλη αὐτή τήν πείρα του τῶν 20 ἐτῶν, ἀναλαμβάνοντας τήν ἔκδοση τῶν βιβλίων καί γιά τίς νέες Τεχνικές καί Ἐπαγγελματικές Σχολές καί τά νέα Τεχνικά καί Ἐπαγγελματικά Λύκεια, σύμφωνα μέ τά Ἀναλυτικά Προγράμματα τοῦ Κ.Ε.Μ.Ε.

ΠΡΟΛΟΓΟΣ ΤΟΥ ΣΥΓΓΡΑΦΕΑ

Τό βιβλίο τοῦτο καλύπτει τήν εἰδική ὁρολογία πού θεωρεῖται ἀπαραίτητη γιά τόν Γεωργοκτηνοτροφικό τομέα τοῦ Ἐπαγγελματικοῦ Λυκείου. Ἡ ἔκταση τῆς ὕλης εἶναι τέτοια, ὥστε πιστεύω, πώς θά δώσει στούς μαθητές τήν ἀπαραίτητη ὑποδομή γιά ἕνα ὁλοκληρωμένο λεξιλόγιο πού νά ἀνταποκρίνεται στίς ἀνάγκες καί τίς ἀπαιτήσεις τῆς εἰδικότητάς τους μέ βάση καί τό ἀναλυτικό πρόγραμμα τῶν μαθημάτων εἰδικότητας.

Ἡ ἀνάπτυξη τῆς ὕλης χωρίζεται σέ 10 ἑνότητες. Κάθε ἑνότητα πραγματεύεται ἕνα συγκεκριμένο θέμα, πού ὁλοκληρώνεται σέ 2 - 3 τμήματα τῆς ἑνότητας. Ἡ ἴδια ἡ ἑνότητα μέσα στήν ὅλη δομή τοῦ βιβλίου εἶναι αὐτόνομη. Δέν συμβαίνει ὅμως τό ἴδιο καί μέ τά τμήματα μέσα στήν ἑνότητα. Αὐτά προχωροῦν ἀπό τίς βασικές καί πιό γενικές γνώσεις στίς πιό εἰδικές καί λεπτομερειακές. Κάθε τμῆμα πάλι ἀποτελεῖται ἀπό 3 - 4 μέρη.

Αὐτά εἶναι:

(α) Ἡ παρουσίαση τοῦ ἀντικειμένου μέσα ἀπό εἰκόνες καί διαγράμματα.

(β) Ἡ ἀνάπτυξη τοῦ θέματος μέ παροχή περισσότερων λεπτομερειῶν πάνω στό θέμα.

(γ) Ἡ πρακτική ἄσκηση πού βασίζεται στά δυό πρῶτα μέρη καί ἔχει σκοπό νά βοηθήσει τήν ἐμπέδωση τῶν γνώσεων πού παρέχονται μ' αὐτά.

(δ) Τό λεξιλόγιο πού καλύπτει ὅλες τίς καινούργιες λέξεις πού παρουσιάζονται σέ κάθε τμῆμα.

Ὅταν μέ 2 - 3 τμήματα ὁλοκληρωθεῖ μιά ἑνότητα, ἀκολουθοῦν ἀσκήσεις πού ἀναφέρονται σέ ὅλη τήν ἔκταση τῆς ἑνότητας. Ἔτσι γίνεται μιά ἀνακύκλωση στό θέμα τῆς ἑνότητας καί πιστεύω πώς εἶναι καί χρήσιμη καί ἀπαραίτητη.

Ἀπό πλευρᾶς λεξιλογίου τά κείμενα εἶναι γραμμένα κάπως ἐλεύθερα. Αὐτό τά κάνει βέβαια πιό δύσκολα, ὅμως ἀναμφισβήτητα πιό αὐθεντικά. Δέν εἶμαι τῆς γνώμης ὅτι μπορεῖς νά διδάξεις εἰδική ὁρολογία μέσα ἀπό ἁπλοποιημένα σέ μεγάλο βαθμό κείμενα. Ἡ χρησιμότητά τους εἶναι τότε πολύ μικρή καί ἀμφίβολη.

Ὅσο ἀφορᾶ ὅμως τή δομή τῆς γλώσσας, αὐτή περιορίζεται στό μεγαλύτερο ποσοστό στίς γνώσεις πού ἀποκτήθηκαν στό πρῶτο βιβλίο τῆς σειρᾶς. Ὅπου ὑπάρχουν γραμματικά ἤ καί συντακτικά φαινόμενα καινούργια, αὐτό γίνεται ἀπό τήν ἀνάγκη ἡ ἀφήγηση νά εἶναι πιό γνήσια καί σωστή καί δέν πρέπει νά ἐξηγηθοῦν ἀναλυτικά στό μαθητή. Σ' αὐτή τή φάση δέν θά βοηθοῦσε σέ τίποτα.

Τό βιβλίο χρωστᾶ τή φροντισμένη μορφή του στή συγκινητικά πολύτιμη, ὑπεύθυνη καί ἀνυπόκριτη βοήθεια τοῦ προσωπικοῦ τοῦ ἐκδοτικοῦ τμήματος τοῦ Ἱδρύματος.

Νά ἐκφράσω τήν εὐγνωμοσύνη μου γιαυτό δέν εἶναι παρά μιά πολύ μικρή ἀνταπόκριση στήν ἀπίθανα μεγάλη καί σπουδαία προσφορά του.

Γ.Σ. Μουζακίτης

ΠΙΝΑΚΑΣ ΠΕΡΙΕΧΟΜΕΝΩΝ

Part II - AGRICULTURE **σελ.**

I. Key to the phonetic symbols

(a) Vowels

1. / i / see
2. / ɪ / sit
3. / e / ten
4. / æ / hat
5. / ɑ / arm
6. / o / got
7. / ɔ / all
8. / ʊ / put
9. / u / too
10. / ʌ / cup
11. / ɜ / fur
12. / ə / ago

(b) Dipthongs

13. / ei / take
14. / əʊ / home
15. / ɑɪ / five
16. / ɑʊ / now
17. / ɔɪ / toy
18. / ɪə / near
19. / eə / hair
20. / ʊə / poor

(c) Consonants

1. / p / pen
2. / b / book
3. / t / ten
4. / d / do
5. / k / cat
6. / g / get
7. / tʃ / child
8. / dʒ / June
9. / f / fall
10. / v / voice
11. / θ / think
12. / ð / this
13. / s / six
14. / z / zoo
15. / ʃ / she
16. / ʒ / vision
17. / h / how
18. / m / man
19. / n / no
20. / ŋ / sing
21. / l / leg
22. / r / red
23. / j / yet
24. / w / wet
25. / ɳ / seven

II. Examples of words with phonetic transcription:

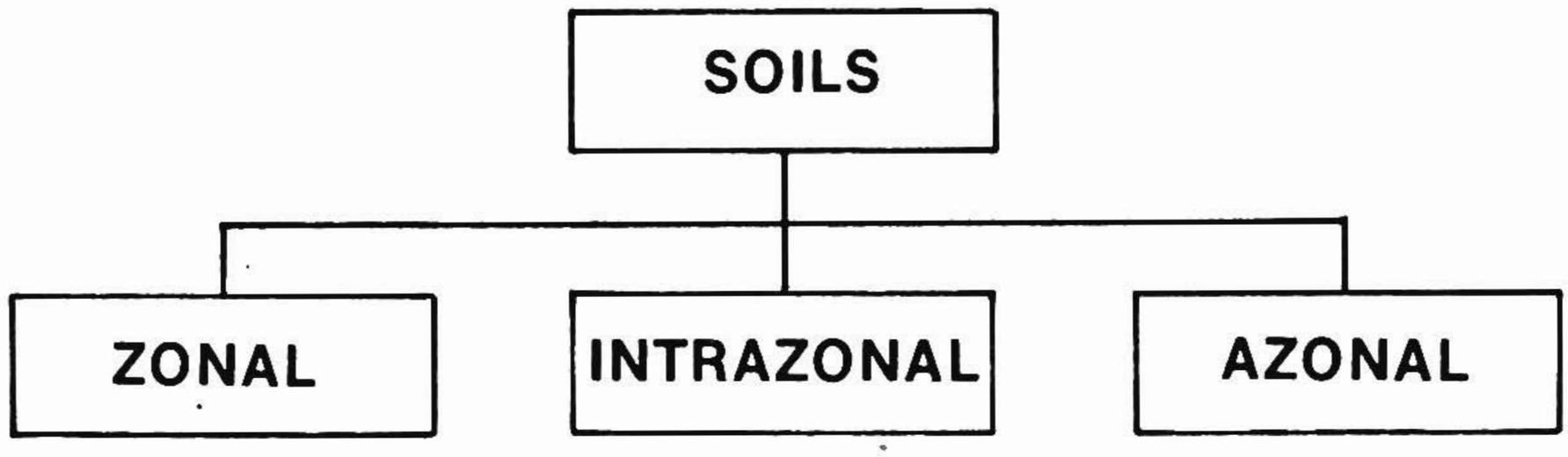
1. see / si /
2. sit / sɪt /
3. take / teɪk /
4. home / həʊm /
5. now / nɑʊ /
6. book / bʊk /
7. child / tʃɑɪld /
8. think / θɪŋ /

III. Phonetic symbols comparison table

	In this book	EPD	Simplified
1.	i	i:	i:
2.	ɪ	i	i
3.	e	e	e
4.	æ	æ	a
5.	ɑ	ɑ:	a:
6.	o	ɔ	o
7.	ɔ	ɔ:	o:
8.	ʊ	u	u
9.	u	u:	u:
10.	ʌ	ʌ	ʌ
11.	ɜ	ə:	ə:
12.	ə	ə	ə
13.	ei	ei	ei
14.	əʊ	ou	ou
15.	ɑɪ	ai	ai
16.	ɑʊ	au	au
17.	ɔɪ	ɔi	oi
18.	ɪə	iə	iə
19.	eə	ɛə	eə
20.	ʊə	uə	uə
21.	—	ɔe	oə

SOILS — CONSTITUENTS AND CHARACTERISTICS

1.1a **Look at the following diagram:**



diag. 1

1.1b **Study the following statements:**

a. All soils fall into three major groups. The *zonal, intrazonal* and *azonal.*
b. The zonal soils reflect the *full influence* of *climate* and *vegetation.*
c. We can find these soils on *gentle slopes.*
d. We separate the zonal soils into two divisions. The *pedocals* and *pedalfers.*
e. We find pedocals in *semiarid* and *arid* regions.
f. Pedocals contain *a layer of lime* either in the surface or at depths varying between 3 and 4 feet.
g. There is an *organic matter* in the surface layer of these soils.
h. The quantity of this matter becomes less with decreasing *rainfall* and higher *temperature.*
i. There are five major groups of pedocal soils according to the content of organic matter.
j. Pedalfers are *non-lime* soils.
k. There are *seven groups* of pedalfer soils.
l. Podzols can be found under *coniferous* forests in cool, humid regions.
m. In a *warm and humid* climate we can find red and yellow podzolic soils whereas in *deciduous forests* under cool and humid conditions we find gray - brown podzolic soils.
n. The yellow colour of the soils is due to the content of *limonite,* a form of iron oxide, and the red colour to the presence of *hematite.*
o. The *intrazonal* soils reflect some local influence, for example poor drainage, to a greater extent than the climatic effect.
p. Apart from *drainage,* it is the *alkalinity, salinity* or high lime content in the parent material that play an important role in the development of these soils.
q. *Azonal* soils are shallow soils with no vertical development.
r. *A soil profile* is a vertical section from the surface downward into the weathered sediments. The layers of the profile, usually three, are the *horizons.*
s. In *young soils* we've got two horizons, the *A horizon,* which is the surface or topsoil, and the *C horizon* which is the weathered sediment. In mature soils there is a zone of clay or organic matter between the A and C horizons. This is the *B horizon.*

t. In temperate climates there are, normally, *two organic layers*. The upper part and the lower part. We call this *lower part humified layer*.
u. We call the A horizon of a soil *"the zone of leaching"* because the rain carries downward into the subsurface layers soluble materials.

1.1 c Study the following figure and the notes referring to it. Fill in the blanks with the appropriate terms from the following.

subsoil
A horizon
mature
horizons
layer

profile
C horizon
parent
rocky
parent

B horizon
horizons
structure
exception
strata

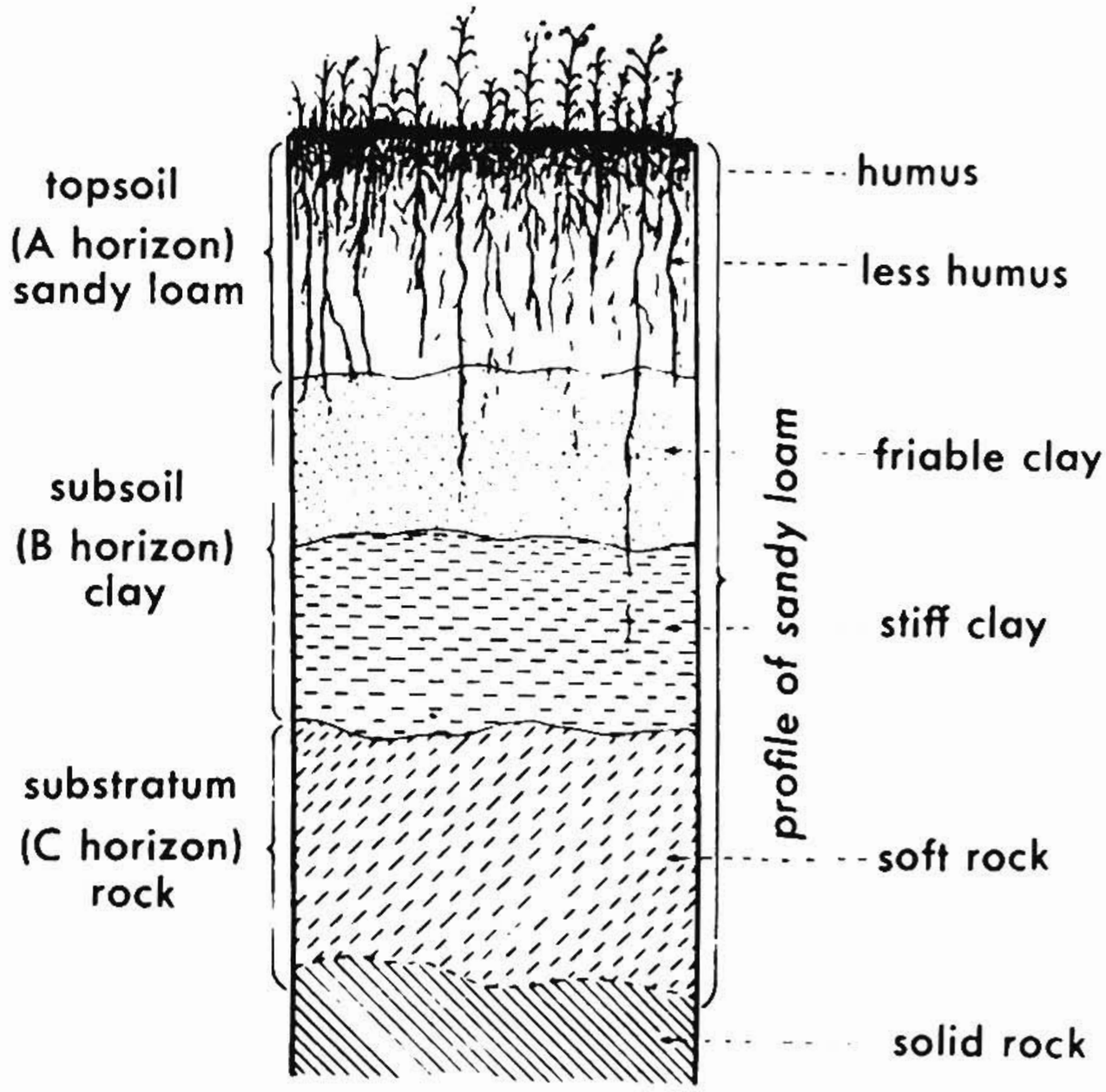


fig. 1

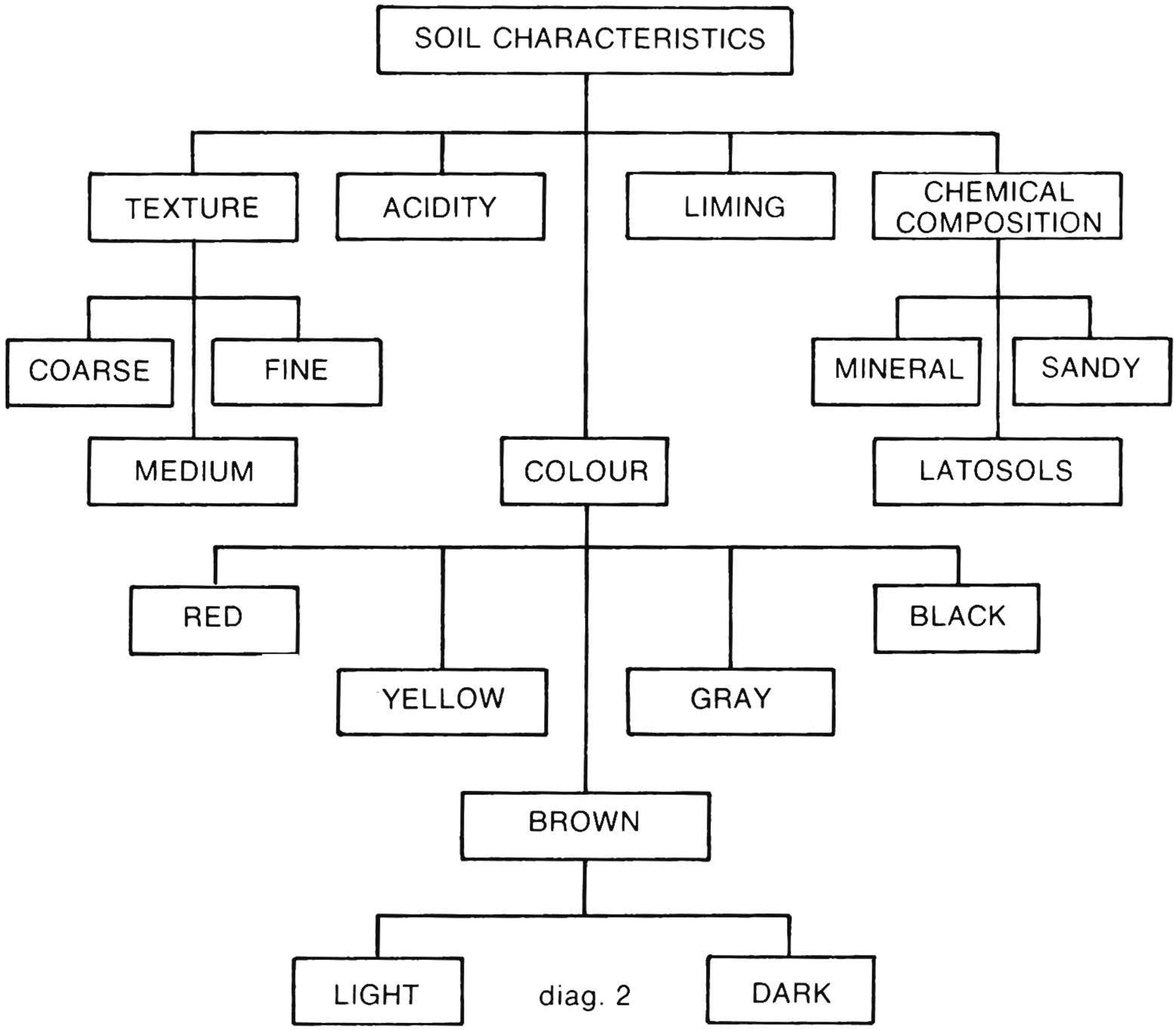
We can see the structure of the soil in its - - - - - - - - (fig. 1). A mature soil normally has A, B and C - - - - - - - - . The topsoil or - - - - - - - - is the covering layer. The - - - - - - - - is the layer beneath the topsoil and we also call it - - - - - - - -, and the layer beneath the subsoil is the - - - - - - - - . The roots of large plants usually grow in the subsoil. In - - - - - - - - soils the C horizon is the basic or - - - - - - - - material. There are some exceptions in the - - - - - - - - of profiles. There is a group of soils without - - - - - - - - developed from deep loose rock or from soft - - - - - - - - deposits. Another - - - - - - - - is the D - - - - - - - -, beneath the soil profile. It is unlike the - - - - - - - - material of which the - - - - - - - - in the profile concists.

Vocabulary

soil / sɔɪl / ἔδαφος
constituent / kən'stɪtʃʊənt / συστατικό
characteristic / 'kærɪktə'rɪstɪk / χαρακτηριστικό
zonal / 'zəʊnl / ζωνικός
intrazonal / 'ɪntrə'zəʊnl / ἐνδοζωνικός

azonal / ə'zəʊnl / ἀζωνικός
fall / fɔl / διακρίνομαι
major / 'meɪdʒə / σπουδαῖος/κύριος
group / grup / ὁμάδα
reflect / rɪ'flekt / ἀντικατοπτρίζω
full / fʊl / πλήρης
influence / 'ɪnfluəns / ἐπηρεάζω
climate / 'klaɪmɪt / κλίμα
vegetation / 'vedʒɪ'teɪʃn / βλάστηση
gentle / dʒentl / ἁπαλός
slope / sləʊp / πλαγιά/κλίση
separate / 'seprət / διακρίνω
division / dɪ'vɪʒn / διαίρεση, κατηγορία
pedocal /
pedalfer
semiarid / 'semɪ'ærɪd / ἡμιάνυδρος
arid / 'ærɪd / ἄνυδρος, ξηρός
region / 'ridʒən / περιοχή
contain / kən'teɪn / περιέχω
layer / 'leɪə / στρῶμα /στρώση
lime / laɪm / ἄσβεστος
either ... or ... / iðə ... ɔ ... / εἴτε ... εἴτε
surface / 'sɜfɪs / ἐπιφάνεια
depth / depθ / βάθος
vary / 'veərɪ / ποικίλλω
between / bɪ'twin / μεταξύ
organic / ɔ'gænɪk / ὀργανικός
matter / 'mætə / ὑλικό
quantity / 'kwontətɪ / ποσότητα
decrease / dɪ'kris / μειώνω
rainfall / 'reɪnfɔl / βροχόπτωση
temperature / 'temprətʃə / θερμοκρασία
content / kən'tent / περιεχόμενο
non-lime / 'non laɪm / μή ἀσβεστοῦχος
podzol / po'dʒɔl / ποτζόλ
coniferous / kə'nɪfərəs / κωνοφόρος
forest / 'forɪst / δάσος
cool / kul / ψυχρός
humid / 'humɪd / ὑγρός
deciduous / dɪ'sɪdʒʊəs / φυλλοβόλος
condition / kən'dɪʃn / κατάσταση, συνθήκη
gray-brown / 'greɪ 'braʊn / γκρίζο - καφέ
limonite / 'laɪmonaɪt / λειμονίτης
hematite / 'hemətaɪt / αἱματίτης
local / 'ləʊkl / τοπικός
drainage / 'dreɪnɪdʒ / ἀποστράγγιση
extent / ɪk'stent / ἔκταση, μέγεθος
effect / ɪ'fekt / ἀποτέλεσμα
appart from / ə'pat frəm / ἐκτός ἀπό
alkalinity / 'ælkə'laɪnɪtɪ / ἀλκαλικότητα
salinity / sə'lɪnətɪ / ἁλμυρότητα
development / dɪ'veləpmənt / ἀνάπτυξη
shallow / 'ʃæləʊ / ρηχός
vertical / 'vɜtɪkl / κατακόρυφος
profile / 'prəʊfaɪl / προφίλ (πλάγια ὄψη)
section / 'sekʃn / τομή
downward / 'daʊnwəd / πρός τά κάτω
weathered / 'weðə(r)d / ἀποσαθρωμένος, διαβρωμένος
sediment / 'sedɪmənt / ἰλύς/ίζημα
horizon / hə'raɪzn / ὁρίζοντας
topsoil / 'topsɔɪl / ἐπιφάνεια τοῦ ἐδάφους
mature / mə'tʃʊə / ἀνεπτυγμένος
temperate / 'temprət / μέτριος, ἤπιος
upper / 'ʌpə / ἄνω
lower / 'ləʊə / κάτω
humified / 'hjumɪfaɪd / νοτισμένος /χουμοποιημένος
leaching / litʃɪŋ / ἔκπλυση
subsurface / 'sʌb'sɜfɪs / ὑπέδαφος
soluble / 'soljʊbl / εὐδιάλυτος

1.2a **Look at the following diagram:**



diag. 2

1.2b **Study the following statements:**

a. We classify the soils as *coarse, medium* or *fine* according to the content of sand, silt and clay.
b. Coarse soils include *sands*, medium soils include *silt* and fine soils include *clays*.
c. Soils vary in *acidity*. Pedocals and most of the azonals are more acid in the surface than in the subsoil.
d. *Drainage, organic matter* and *iron compounds* affect the colour of the soils.
e. The *red* colour indicates presence of *hematite*; the *yellow* colour indicates presence of *limonite*.
f. The *brown* colour is an indication of organic matter presence in the soil. The *higher* percentage makes the soil *dark* brown, whereas a *lower* percentage makes the soil *light* brown.

g. There is a very *small quantity of iron* in the soils when their surface is *gray* in humid areas.
h. *Black* soils in a wet condition are often dark gray when dry. The gray and yellow colour in a subsoil means that drainage is not perfect.
i. When *lime* is too much, phosphorous and iron are low. Then the possibility of plant development is limited.
j. *Mineral soils* consist of oxides of silicon, aluminum, iron, calcium, magnesium etc.
k. *Latosols* contain a high percentage of iron and aluminum oxide.
l. *Sandy* soils contain more than 90% silicon and oxygen.

1.2c **Complete the following table giving the basic constituent of the various types of soils:**

No.	TYPE OF SOIL	MAIN CONSTITUENT
1.	Medium texture	
2.	Coarse texture	
3.	Fine texture	
4.	Red soils	
5.	Yellow soils	
6.	Dark brown soils	
7.	Light brown soils	
8.	Gray soils	
9.	Mineral soils	
10.	Latosols	
11.	Sandy soils	

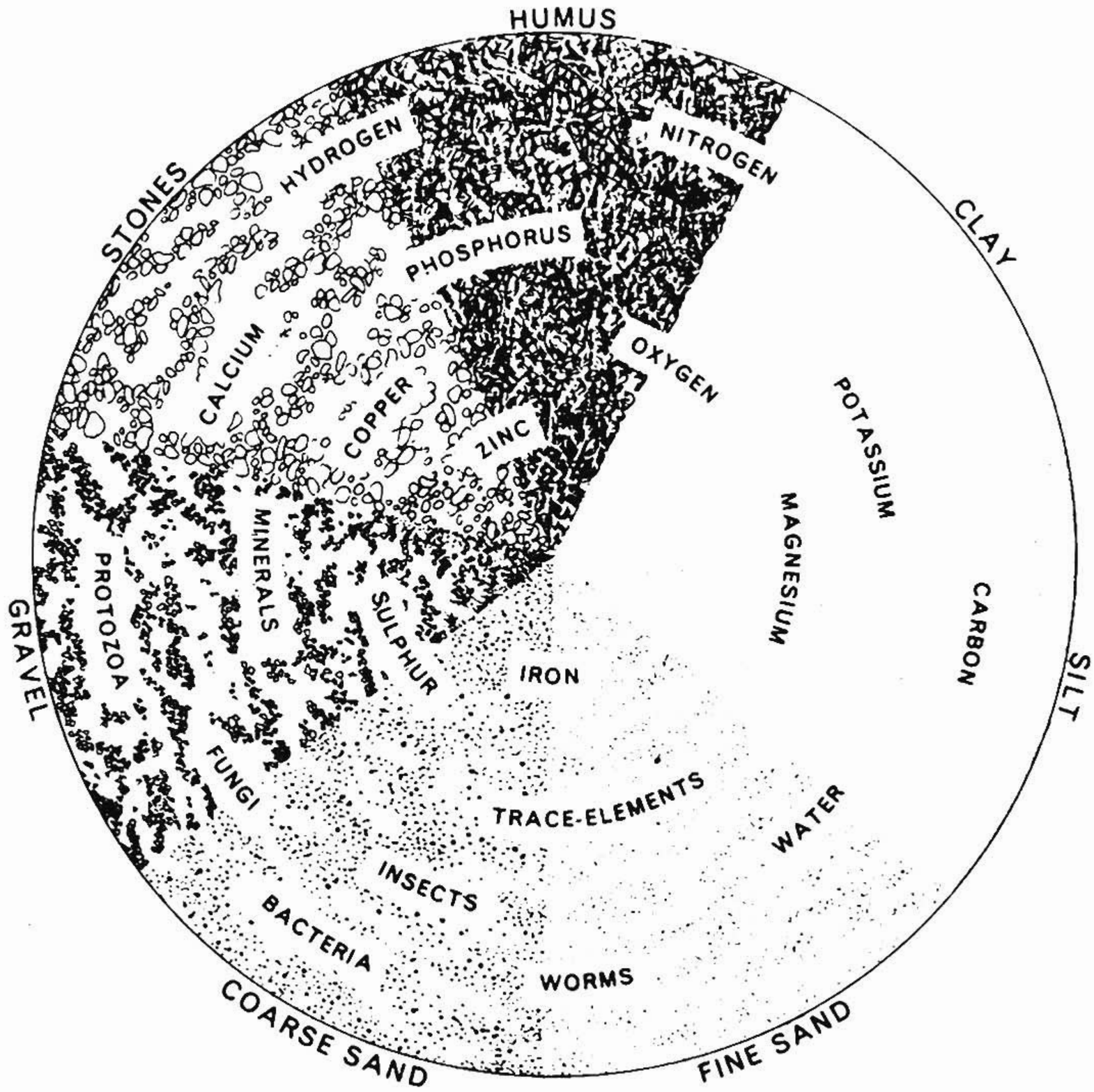
Table 1

Vocabulary

texture / 'tekstʃə / ὑφή, κοκκομετρική σύσταση
coarse / kɔs / χοντρόκοκκος, τραχύς
medium / 'midɪəm / μέτριος
fine / faɪn / λεπτός
acidity / ə'sɪdətɪ / ὀξύτητα
liming / 'laɪmɪŋ / ἐμπλουτισμένος μέ μίγμα ἀσβέστου
composition / 'kompə'zɪʃn / σύνθεση
mineral / 'mɪnrl / ὀρυκτός
latosol / 'lætosəʊl / λατοσόλ
sandy / 'sændɪ / ἀμμώδης
classify / 'klæsɪfaɪ / ταξινομῶ

sand / sænd / ἄμμος
silt / sɪlt / ἰλύς
clay / kleɪ / ἄργιλος, πηλός
include / ɪn'klud / περιλαμβάνω
compound / 'kompaʊnd / ἕνωση
affect / ə'fekt / ἐπηρεάζω
indicate / 'ɪndɪkeɪt / δείχνω
presence / prezns / παρουσία
indication / 'ɪndɪ'keɪʃn / ἔνδειξη
percentage / pə'sentɪdʒ / ποσοστό %
perfect / 'pɜfɪkt / τέλειος
limited / 'lɪmɪtɪd / περιορισμένος

1.3a **Study the following pie diagram:**



1.3b **Consider the following statements carefully:**

a. There are four main components in soils. They are: *mineral or inorganic* particles, *vegetable or organic* matter (humus), *air* and *water*.
b. The soil is also *animal* because of the insects, worms, protozoa, fungi, bacteria and other minute animals.
c. *Sandy soils* are deep. They can be worked easily and are suitable for all plants. They have low *water-holding* capacity.
d. *Chalky soils* are shallow and are not suitable for fruit trees. *Drainage* is satisfactory.
e. *Wet soils* create considerable problems to almost all kinds of plants when they reach the wet layer. Therefore, special treatment is required.
f. *Clay soils* have the disadvantage of poor subsoils. They hold up drainage in winter and are unsuitable for root crops.

1.3c **Study the following moisture chart:**

Amount of soil moisture	coarse texture	medium texture	fine texture
zero	loose soil, falls through fingers	small lumps, powdery	cracked surface, hard, baked appearance
less than half	looks dry, does not form a ball	crumbly, it forms a ball	forms a ball quite easily
half to three quarters	forms a ball crumbling easily	forms slight-ly pliable ball	forms a ball and long threads when rolled bet-ween palms and hands
three quarters and over	dark colour, forms ball easily broken	forms very ''pliable ball, sticks to hands	very sticky, forms long threads, dark in colour

Table 2

Vocabulary

humus / 'hjuməs / χοῦμος, μαυρόχρωμα
gravel / grævl / ἀμμοχάλικο
trace / treɪs / ὑπόλειμμα /ίχνος
element / 'eləmənt / στοιχεῖο
worm / wɜm / σκουλήκι
insect / 'ɪnsekt / ἔντομο
fungus / 'fʌŋgəs / (fungi fʌŋ'gaɪ), μύκητας
bacterium / bæk'tɪərɪəm / (bacteria - bæk'tɪərɪə), βακτηρίδια
component / kəm'pəʊnənt / συστατικό
inorganic / 'ɪnɔ'gænɪk / ἀνόργανος
particle / 'patɪkl / μόριο
minute / maɪnjut / λεπτός, μικροσκοπικός
deep / dip / βαθύς
work / wɜk / δουλεύω
easily / 'izlɪ / εὔκολα
suitable / 'sutəbl / κατάλληλος
plant / plænt / φυτό
low / ləʊ / μικρός
hold / həʊld / συγκρατῶ
capacity / ke'pæsətɪ / ἱκανότητα

chalky / tʃɔkɪ / ἀσβεστολιθικός
fruit tree / 'frut 'tri καρποφόρο δέντρο
satisfactory / 'sætɪs'fæktrɪ ἱκανοποιητικός
create / krɪ'eɪt / δημιουργῶ
considerable / kən'sɪdrəbl / σημαντικός
reach / ritʃ / φτάνω
special / 'speʃl / εἰδικός
treatment / 'tritmənt / ἀγωγή, μεταχείρηση
require / rɪ'kwaɪə / ἀπαιτῶ
disadvantage / 'dɪsəd'vantɪdʒ / μειονέκτημα
unsuitable / ʌn'sutəbl / ἀκατάλληλος
root / rut / ρίζα
crop / krop / σοδιά (root crop — Φυτό μέ φαγώσιμη ρίζα)
loose / lus / χαλαρός, μπόσικος
crumble / 'krʌmbl / θρυμματίζω
break / breɪk / σπάζω
lump / lʌmp / σβῶλος
powdery / 'paʊdərɪ / σάν σκόνη
crumbly / 'krʌmblɪ / εὔθρυπτος
slightly / 'slaɪtlɪ / ἐλαφρά
pliable / 'plaɪəbl / εὔκαμπτος
stick / stɪk / κολλῶ
crack / kræk / ραγισμένος
baked / beɪkt / ψητός
appearance / ə'pɪərns / μορφή, ἐμφάνιση
thread / θred / ἴνα
roll / rəʊl / κάνω ρολό
palm / pam / παλάμη

EXERCISES

I. Answer the following questions using a complete sentence for each answer:

1. Which are the three major groups of soils?
2. In which regions can we find pedocals?
3. How many groups of pedocal soils are there?
4. Which is their basic difference?
5. How many groups of pedalfer soils are there?
6. What soils can we find under coniferous forests?
7. How many horizons have we got in mature soils?
8. Which are the characteristics of soil?
9. What affects the colour of the soils?
10. What is the effect of hematite in soils?
11. What is the effect of limonite in soils?
12. What does the brown colour of soils indicate?
13. What makes the soil dark brown?
14. What does the brown and yellow colour in a subsoil mean?
15. Which is the main constituent of medium texture soil?
16. What is the colour of a wet black soil when it is dry?
17. What is the main constituent in light brown soils?

II. Say whether the following statements are TRUE or FALSE according to the information of the unit:

— 1. There are three groups of zonal soils.
— 2. Pedocals contain a layer of lime.
— 3. Pedalfers are non-lime soils.
— 4. In temperate climates there are, normally, three organic layers.
— 5. "The zone of leaching" is the name of a type of subsoil.
— 6. Coarse soils include sands.
— 7. The dark brown soils show a low percentage of organic matter.
— 8. Soils are the same in acidity.
— 9. Air and water are among the components in soils.
— 10. Sandy soils are unsuitable for all plants.
— 11. Drainage is unsatisfactory in chalky soils.
— 12. Special treatment is required for wet soils.
— 13. The subsoils in clay soils are poor.
— 14. With zero moisture the coarse soil is loose.
— 15. With zero moisture the medium soils have a cracked surface.

III Which is correct in the following a, b or c?

1. We find - - - - - - soiis on gentle slopes.
   a. zonal
   b. intrazonal
   c. azonal
2. The quantity of organic matter in pedocals - - - - - - with decreasing rainfall.
   a. is the same
   b. increases
   c. decreases
3. In a warm and humid climate we can find - - - - - - - -
   a. red soils only.
   b. yellow soils only.
   c. red and yellow soils.
4. In young soils we've got - - - - - - - -
   a. A and B horizons.
   b. A and C horizons.
   c. B and C horizons.
5. A soil is classified as fine according to the - - - - - - - -
   a. colour.
   b. texture.
   c. chemical composition.
6. Sandy soils are - - - - - - - -
   a. shallow.
   b. wet.
   c. deep.
7. Chalky soils are - - - - - -
   a. shallow.
   b. wet.
   c. deep.

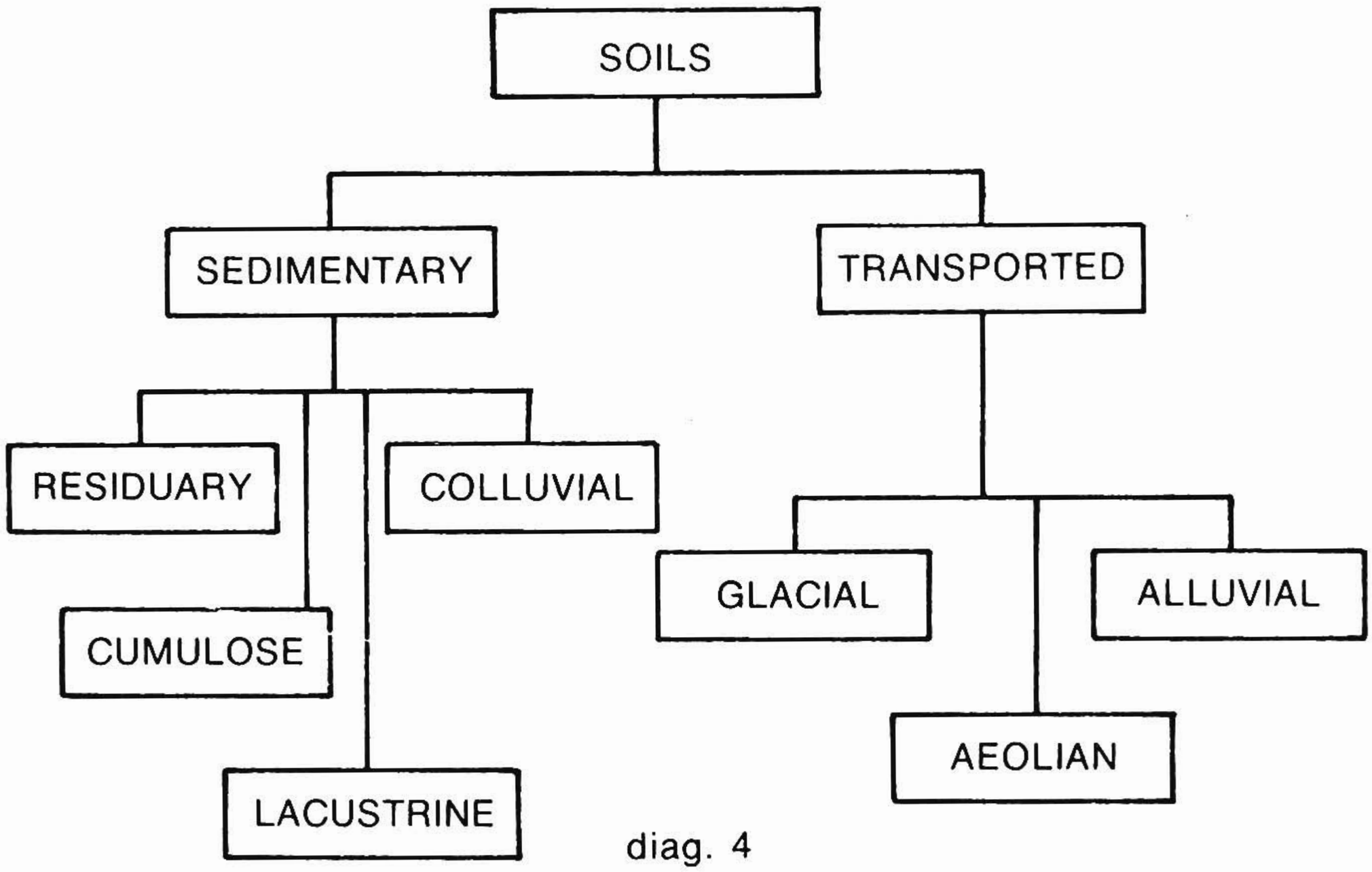
8. Clay soils are unsuitable for - - - - - - - -
   a. fruit trees.
   b. flowers.
   c. root crops.
9. A coarse soil looks dry with - - - - - - - - moisture.
   a. zero
   b. less than half
   c. more than half
10. A medium soil forms slightly pliable balls when moisture is - - - - - - - -
   a. zero.
   b. less than half.
   c. more than half.
11. A fine soil forms ball quite easily when moisture is - - - - - - - -
   a. zero.
   b. less than half.
   c. more than half.
12. A fine soil is very sticky when moisture is - - - - - - - -
   a. zero.
   b. less than half.
   c. more than half.
13. A ball of coarse soil crumbles easily when moisture is - - - - - - - -
   a. zero.
   b. less than half.
   c. more than half.

IV Match a word or phrase from column A with a word or phrase from column B to make true and correct statements:

A	B
1. The yellow colour of soils is due to	a. some local influence.
2. The zonal soils reflect	b. shallow soils.
3. Azonal soils are	c. the content of iimonite.
4. The red colour of soils is due to	d. horizons.
5. The intrazonal soils reflect	e. clays.
6. We call the vertical section of soil	f. Silicon and oxygen.
7. Medium soils include	g. iron, calcium and magnisium.
8. Latosols contain	h. the full influence of climate.
9. Sandy soils contain	i. iron.
10. We call the layers of the profile	j. iron and aluminum oxide.
11. Fine soils include	k. the content of hematite.
12. Mineral soils contain among others	l. silt.
	m. oxygen.
	n. profile.

SOIL CLASSIFICATION

2.1a **Look at the following diagram:**



diag. 4

2.1b **Study the following statements:**

a. There are two large divisions of soils. They are the *sedimentary soils* and the *transported soils.*
b. There are four different kinds of soils in the sedimentary class. They are the *residuary, cumulose, lacustrine* and *colluvial* soils.
c. The residuary soils are *original.* They lie directly above the parent rock.
d. Rotted plant material makes the *cumulose* soils.
e. *Lacustrine* soils are in areas where once there were lakes.
f. The action of gravity forms the *colluvial* soils.
g. In general, sedimentary soils are formed from *sediments.*
h. The movement of wind, water and ice form the *transported* soils.
i. There are three basic classes of transported soils. They are the *aeolian,* the *alluvial* and the *glacial* soils.
j. The *action of the wind* forms the aeolian soils.
k. We also call the aeolian soils *loessial.*
l. *Alluvium* is a sedimentary material. The action of running water forms the *alluvial* soils.
m. In the high latitudes *glacial* soils occur. Great ice streams, the glaciers, form these soils.

2.1c Complete the following sentences using one of these words:

action	**alluvial**	**aeolian**
loessial	**colluvial**	**lacustrine**
residuary	**glacial**	**cumulose**

1. **The action of running water forms — soils, whereas the action of the wind forms — soils which we also call —**
2. **Near the foot of a cliff we can find — soils. They are formed by the — of gravity.**
3. **We can find — soils near the lakes or in places covered by lakes in the past.**
4. **Directly above the parent rocks we can find — soils.**
5. **Materials from rotted plans form — soils.**
6. **Great ice streams usually form — soils.**

Vocabulary

sedimentary / 'sedɪ'mentrɪ / ἱζηματώδης, ἱζηματογενής
transported / trɑn'spɔtɪd / μεταφερόμενος
residuary / rɪ'zɪdjʊərɪ / ἐναπομένων
cumulose / 'kjumjʊ'ləʊz / συσσωρευμένος
lacustrine / lə'kjustrɪn / λιμναῖος
colluvial / kə'luviəl κολλουβιακός
glacial / gleɪʃl / παγετώνας
aeolian / i'əʊlɪən / αιολικός
alluvial / ə'luvɪəl / ἀλλουβιακός
division / dɪ'vɪʒn / ὑποδιαίρεση
original / ə'rɪdʒnl / ἀρχικός
lie / lɑɪ / κεῖμαι
directly / dɪ'rektlɪ / κατ' εὐθείαν
parent rock / 'peərnt rok / μητρικό πέτρωμα
rotted / 'rotɪd / ἀποσυντεθιμένος
plant / plænt / φυτό
material / mə'tɪərɪəl / ὑλικό
action / 'ækʃn / ἐνέργεια
gravity / 'grævətɪ / βαρύτητα
form / fɔm / μορφή
running / 'rʌnɪŋ / τρεχούμενος
latitudes / 'lætɪtjudz / περιοχές
occur / ə'kɜ / ἐμφανίζομαι
glacier / 'glæsɪə / παγετώνας

Exercises

I. Answer the following questions using one complete word for each answer:

1. Which are the main soil divisions?
2. How many classes of sedimentary soils exist?

3. What makes the cumulose soil?
4. What kinds of soils can we find near lakes?
5. What kind of material is alluvium?

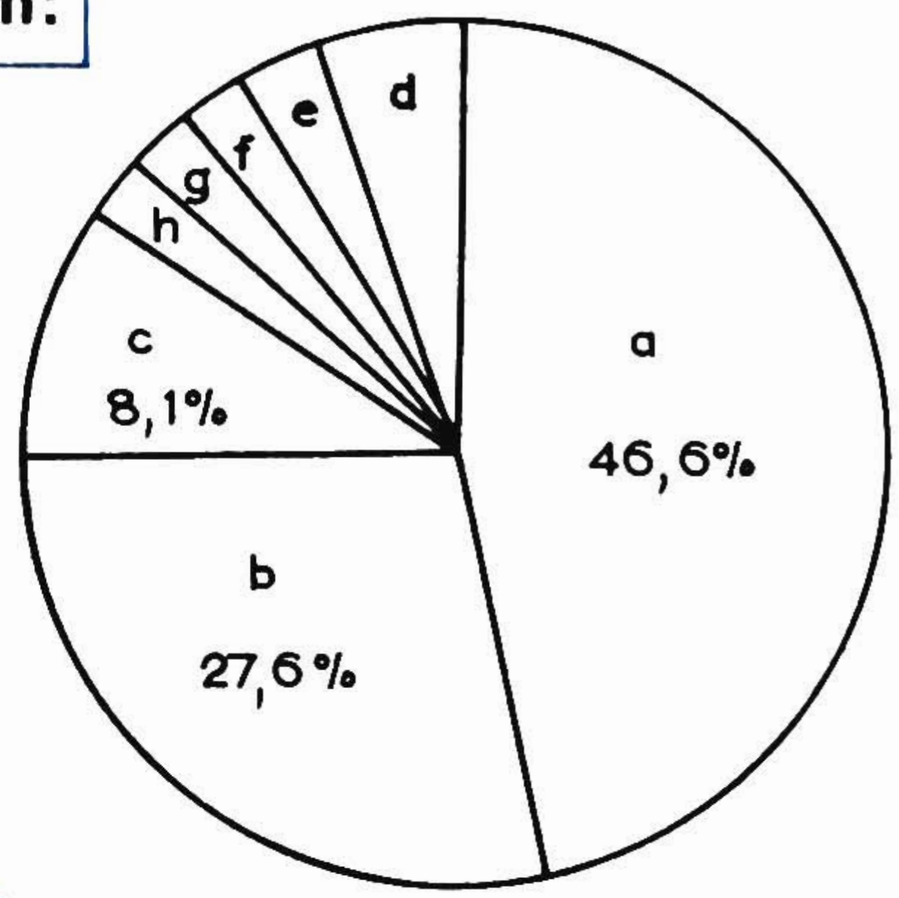
II. Which is correct in the following a, b or c?

1. The residuary soils lie - - - - - - - -
   a. near lakes.
   b. above rocks.
   c. near cliffs.
2. The lacustrine soils lie - - - - - - - -
   a. near lakes.
   b. above rocks.
   c. near cliffs.
3. Colluvial soils lie - - - - - - - -
   a. near lakes.
   b. above rocks.
   c. near cliffs.
4. The action of - - - - - - - - forms the aeolian soils.
   a. gravity
   b. wind
   c. water
5. The action of - - - - - - - - forms the colluvial soils.
   a. gravity
   b. wind
   c. water
6. The action of - - - - - - - - forms the alluvial soils.
   a. gravity
   b. wind
   c. water
7. Great streams form the - - - - - - - - soils.
   a. loessial
   b. glacial
   c. alluvial
8. Materials from rotted plants form the - - - - - - - - soils.
   a. loessial
   b. lacustrine
   c. cumulose
9. The movement of - - - - - - - - form the transported soils.
   a. wind and water
   b. water and ice
   c. wind, water and ice
10. The glaciers are - - - - - - - -
   a. soils.
   b. ice streams.
   c. both a and b.

CHEMICAL CHARACTERISTICS OF SOILS

3.1a **Look at the following pie diagram:**

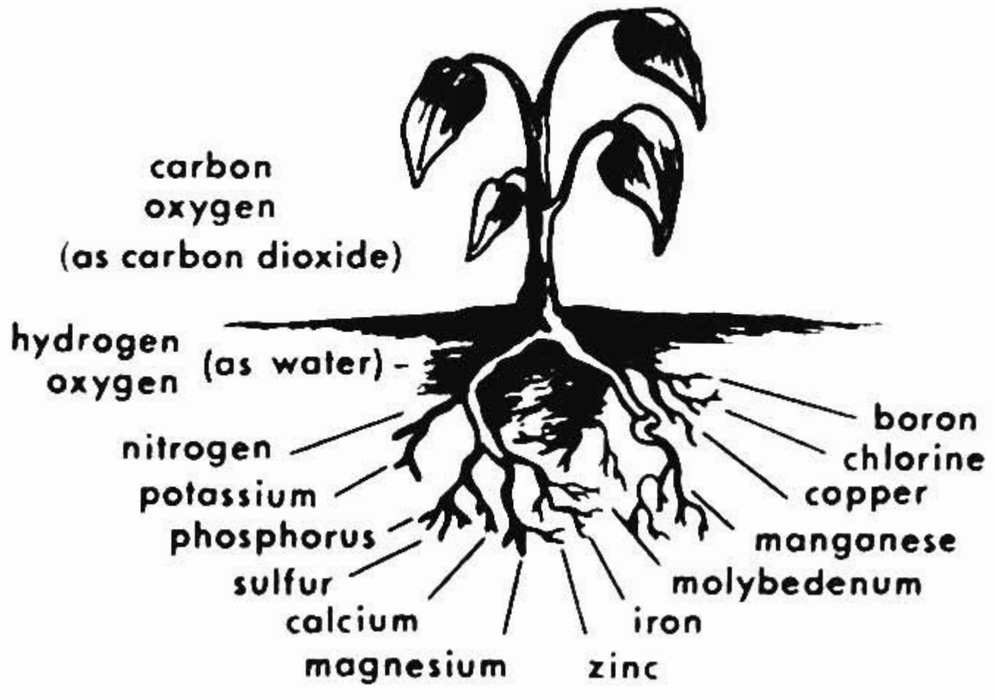
	oxygen
	silicon
a — 46.6%	aluminum
b — 27.6%	iron
c — 8.1%	calcium
d — 5.1%	sodium
e — 3.6%	potassium
f — 2.8%	other, i.e
g — 2.6%	magnesium 2.1%
h — 3.6%	titanium 0.6%
	phosphorus 0.12%
	other elements 0.78%



diag. 5

3.1b **Study the following statements:**

a. The soil consists of *ten chemical elements.*
b. We often refer to these ten elements as the *macroelements.*
c. There are also some other elements like boron, cobalt, copper, manganese and zinc. We call these elements *microelements.*
d. Plants obtain carbon from the air by *photosynthesis* and combine it with hydrogen and oxygen which they obtain from water.
e. We can also call the macroelements *macronutrients* and the microelements *micronutrients.*
f. Figure 2 shows a number of micronutrients.
g. Nitrogen, phosphorus, potassium, sulfur, calcium and magnesium can be found in the soil.
h. *Photosynthesis* is a process during which plants make nutrient elements from air and water when light and chlorophyll exist.
i. Sulfur and magnesium are quite necessary in *chlorophyll formation.*
j. *Iron and magnesium* are needed in photosynthesis.
k. Calcium and zinc *affect* the growth of roots and other parts of the plants.
l. *Chlorine* is also an important element. Without it the plant loses colour and dies.



3.1c **Here is a list of chemical elements. Say which of these elements are:**

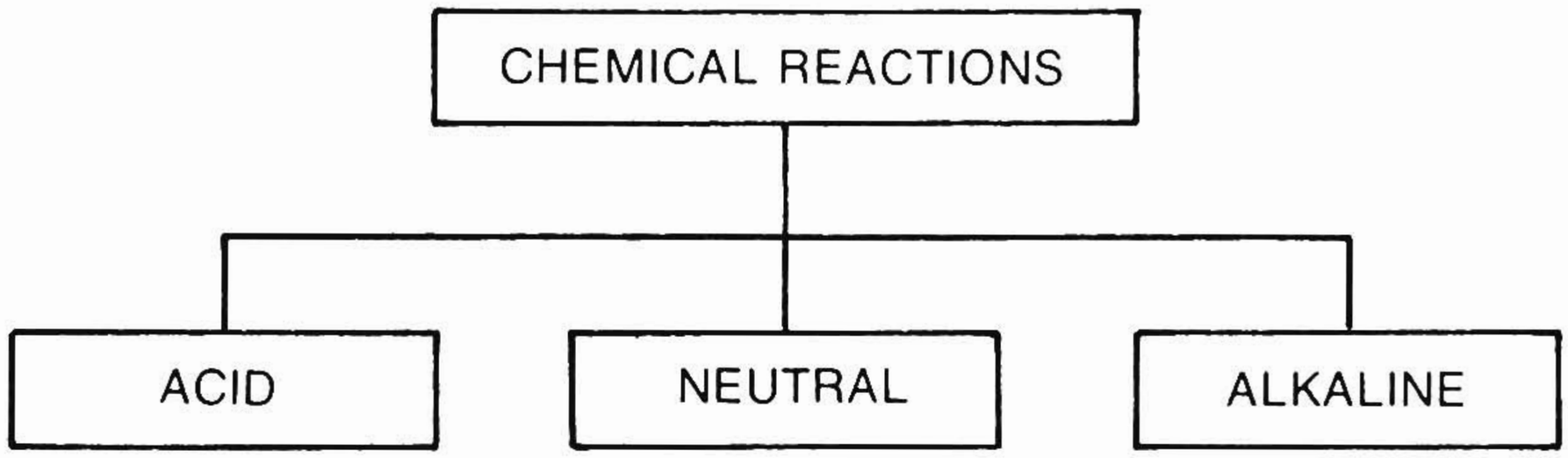
a. macroelements.
b. microelements.
c. in the soil.
d. necessary in chlorophyll formation.
e. needed in photosynthesis.
f. important in the growth of roots and other parts of the plants.
g. important for the colour of the plants.

aluminum	copper	nitrogen	sodium
boron	hydrogen	oxygen	sulfur
calcium	iron	phosphorus	titanium
chlorine	magnesium	potassium	zinc
manganese	silicon	cobalt	

Vocabulary

chemical / 'kemɪkl / χημικός
oxygen / 'oksɪdʒən / όξυγόνο
silicon / 'sɪlɪkən / πυρίτιο
aluminium / 'æljʊ'mɪn əm / άλουμίνιο
iron / 'ɑɪən / σίδηρος
calcium / 'kælsɪəm / άσβέστιο
sodium / 'səʊdɪəm / νάτριο
potassium / pə'tæsɪəm / κάλιο
magnesium / mæg'nizɪəm / μαγνήσιο
titanium / tɑɪ'teɪnɪəm / τιτάνιο
phosphorus / 'fosfərəs / φωσφόρος
consist / kən'sɪst / συνίσταμαι
refer / rɪ'fɜ / άναφέρω
macroelement / 'mækrəʊ'eləmənt / μακροστοιχεῖο
boron / 'bɔrən / βόριο
cobalt / 'kəʊbɔlt / κοβάλτιο
copper / 'kopə / χαλκός
manganese / 'mæŋgə'nɪz / μαγγάνιο
zinc / zɪŋk / ψευδάργυρος
microelement / 'mɑɪkrəʊ'eləmənt / μικροστοιχεῖο
obtain / əb'teɪn / άποκτῶ
photosynthesis / 'fəʊtəʊ'sɪnθəsɪs / φωτοσύνθεση
combine / 'kombɑɪn / συνδυάζω
hydrogen / 'hɑɪdrədʒən / ύδρογόνο
macronutrient / 'mækrəʊ'njutrɪənt / μακροθρεπτικός
micronutrient / 'mɑɪkrəʊ'njutrɪənt / μικροθρεπτικός
nitrogen / 'næɪtrədʒən / νίτρο
sulfur / 'sʌlfə / θεῖο
process / 'prəʊses / μέθοδος
nutrient / 'njutrɪənt / θρεπτικός
chlorophyll / 'klorofɪl / χλωροφύλλη
exist / ɪg'zɪst / ύφίσταμαι
formation / fɔ'meɪʃn / σχηματισμός
affect / ə'fekt / έπιδρῶ
growth / grəʊθ / άνάπτυξη
chlorine / 'klɔrin / χλώριο

3.2a **Look at this diagram:**



3.2b **Study the following statements:**

a. We can classify soils into three classes according to their *chemical reactions.*
b. The reactions of soils may be *acid. neutral.* and *alkaline.*
c. We use several *methods* to test the chemical reactions of soils.
d. The measurement of the *potential of hydrogen* (pH) is a method of investigation of acid.
e. There is a device, *the pH meter.* which measures the potential of hydrogen and gives *the acid content* of the soil
f. Soils with *pH readings* from 0-6.5 are acid. Soils from 6.6—7.3 pH readings are neutral and readings above 7.3 are alkaline. However, these ranges are not always fixed.
g. There are some plants requiring high acid content, for example: azaleas, conifers, rhododendrons etc.
h. The soil provides also plants with *mechanical support.*
i. Chemical and physical *processes* as well as the *activities* of living organisms *change the soil* constantly.
j. The type of *clay minerals* and the extent of *weathering processes* make the soils vary in acidity.
k. For acid sensitive crops we use *lime* in soils to make them neutral.

3.2c **In the following list of plants the number in parenthesis denotes preference in pH. Classify these plants under the headings of the three types of soils, i.e. acid, neutral or alkaline:**

asparagus (6-7)
azalea (4.5-5.5)
barley (5.5-7)
beans (6-7)
beetroots (6-7)
blackberry (4.5-6)
cabbages (5.75-7)
carrots (5.75-7)
cauliflowers (6-7)
clover (6.5-7.5)
corn (5.5-7)
cotton (5.5-6.5)
cucumbers (5.5-6.75)
melons (6-6.5)
oats (5.5-7)
onions (6-6.5)
peas (6-7)
potatoes (5.5-6.8)
spinach (6-7)
strawberry (5.3-6.5)
tobacco (5.25-5.75)
tomatoes (5.50-6.75)
wheat (5.50-7)

Vocabulary

reaction / riækʃən / ἀντίδραση
acid / æsɪd / ὀξύ
neutral / 'njutrl / οὐδέτερος
alkaline / 'ælkəlaɪn / ἀλκαλικός
classify / 'klasɪfaɪ / ταξινομῶ
test / test / δοκιμή, δοκιμάζω
measurement / 'meʒə(r)mənt / μέτρηση
potential / pə'tenʃl / λανθάνων
investigation / ɪn'vestɪ'geɪʃn / ἀνίχνευση
device / dɪ'vaɪs / συσκευή
content / kən'tent / περιεχόμενο
reading / 'ridɪŋ / ἔνδειξη
range / reɪndʒ / κλίμακα
fixed / fɪkst / καθορισμένος, σταθερός
require / rɪ'kwaɪə / ἀπαιτῶ
azalea / əz'eɪlɪə / ἀζαλέα
conifer / 'konɪʃə / κωνοφόρο
rhododendron / 'rəʊdə'dendrən / ροδόδεντρο
provide / prə'vaɪd / παρέχω
mechanical / mɪ'kænɪkl / μηχανικός
support / sə'pɔt / ὑποστήριγμα
physical / 'fɪzɪkl / φυσικός
activity / æ'ktɪvətɪ / δραστηριότητα
living / ''lɪvɪŋ / ζωντανός
organism / 'ɔgænɪzm / ὀργανισμός
constantly / 'kənstəntlɪ / σταθερά
clay / kleɪ / πηλός
mineral / 'mɪnrl / ὀρυκτό
extent / ɪk'stent / ἔκταση
weathering / 'weðə(r)ɪŋ / διάβρωση, ὀξείδωση
vary / 'veərɪ / ποικίλλω
acidity / ə'sɪdətɪ / ὀξύτητα
sensitive / 'sensətɪv / εὐαίσθητος
lime / laɪm / ἄσβεστος
denote / dɪ'nəʊt / φανερώνω
preference / 'prefrəns / προτίμηση
heading / 'hedɪŋ / ἐπικεφαλίδα
asparagns / ə'spærəgəs / σπαράγγι
barlet / 'balɪ / κριθάρι
bean / bin / φασόλι
beetroot / 'bitrut / παντζάρι
blackberry / 'blækbrɪ / βατόμουρο
cabbage / 'kæbɪdz / λάχανο
carrot / 'kærət / καρότο
cauliflower / 'kolɪflaʊə / κουνουπίδι
clover / 'kləʊvə / τριφύλλι
corn / kɔn / καλαμπόκι
cotton / kotn / μπαμπάκι
cucumber / kjukʌmbə / ἀγγούρι
melon / 'melən / πεπόνι
oats / əʊts / βρώμη
onion / 'ʌnɪən / κρεμμύδι
pea / pi / μπιζέλι
potato / pə'teɪteʊ / πατάτα
spinach / 'spɪnɪdʒ / σπανάκι
strawberry / 'strɔbrɪ / φράουλα
tobacco / tə'bækəʊ / καπνός
tomato / tə'mɑtəʊ / τομάτα
wheat / wit / στάρι

3.3 a **Look at the following figure:**

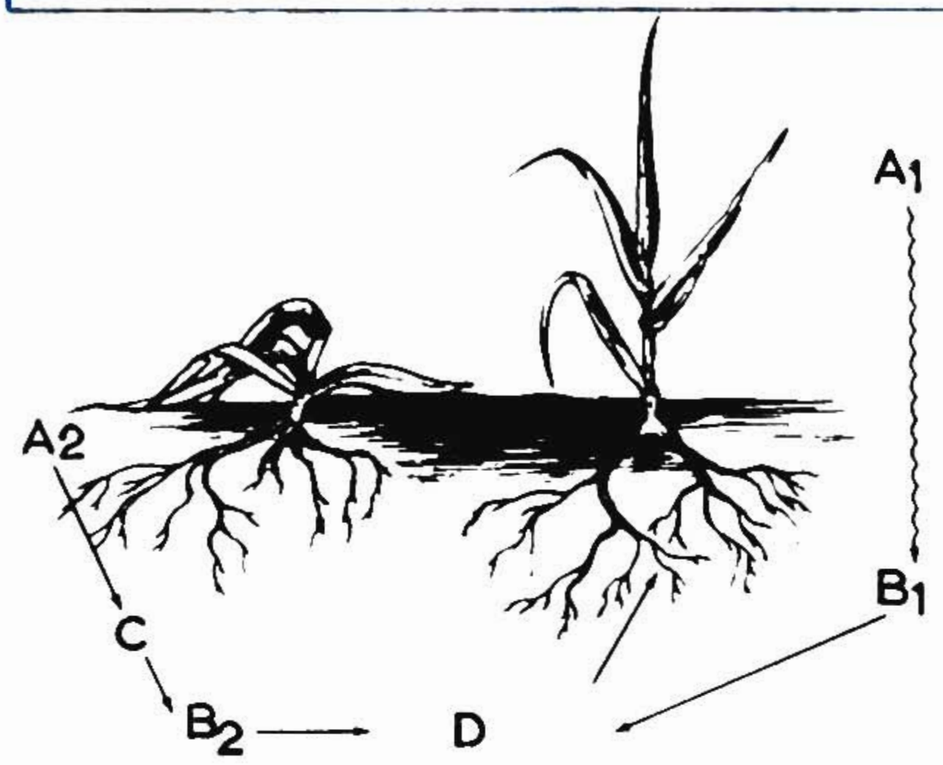


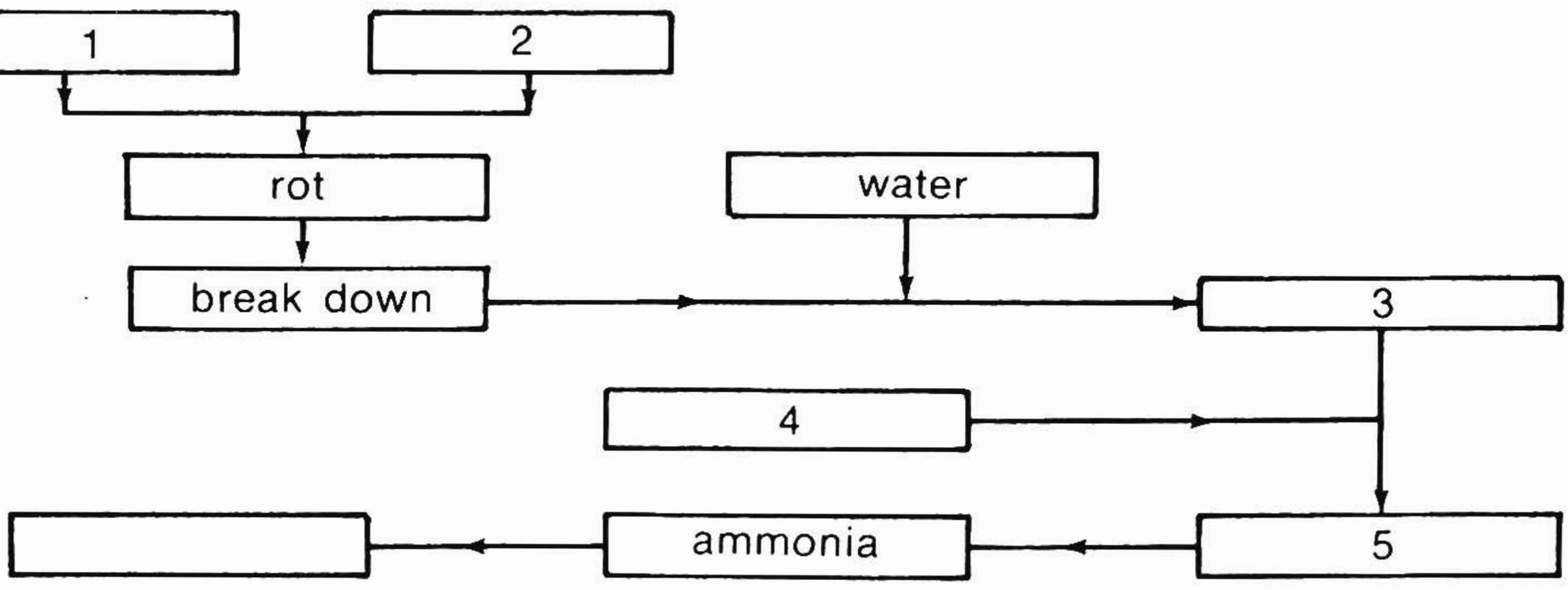
fig. 2

A1 nitrogen from air to soil
B1 bacteria
A2 organic matter in and on soil
C ammonia
B2 bacteria
D compounds of nitrogen and oxygen

3.3b **Study the following statements:**

a. *Nitrogen* is quite *important* for cell division, growth, and respiration.
b. Photosynthesis takes place at the *presence* of nitrogen and chloroplyll.
c. We can find nitrogen in the *growing tips, buds, and young leaves.*
d. At *maturity* nitrogen moves into the *seed.*
e. Phosphorus is also an element *required* for photosynthesis.
f. We can find phosphorus in the *growing parts of the plant,* the flower and the seed.
g. This is a step by step description of the *nitrogen cycle,* in rough terms.
g.1 Plant and animal materials *rot* and *break down* chemically.
g.2 They combine with water and form *a carbonic acid solution.*
g.3 This solution *combines* with inorganic elements
g.4 Finally the *nutrients* result.
g.5 During this process the organic material is *simplified* and nitrogen is *released* in the form of *ammonia.* This changes into *nitrates.*

3.3c **Complete the boxes of the following flow chart with the terms referring to the nitrogen cycle:**



Vocabulary

organic / ɔ'gænɪk / ὀργανικός
matter / 'mætə / ὕλη
ammonia / ə'məʊnɪə / ἀμμωνία
compound / 'kompaʊnd / ἕνωση
cell / sel / κύτταρο
division / dɪ'vɪʒn / διαίρεση
respiration / 'respə'reɪʃn / ἀναπνοή
tip / tɪp / ἄκρο
bud / bʌd / μάτι (φυτοῦ)
maturity / mə'tjʊərətɪ / ὡριμότητα
seed / sid / σπόρος
description / dɪ'skrɪpʃn / περιγραφή
cycle / saɪkl / κύκλος
rough / rʌf / πρόχειρος
rot / rot / σαπίζω
break down / breɪk daʊn / ἀναλύομαι
chemically / 'kemɪklɪ / χημικά
combine / kəm'baɪn / συνδυάζομαι
carbonic acid / kɑ'bonɪk 'æsɪd / ἀνθρακικό ὀξύ
solution / sə'luʃŋ / διάλυση
inorganic / ɪnɔ'gænɪk / ἀνόργανος
simplify / 'sɪmplɪfaɪ / ἁπλοποιῶ
release / rɪ'lɪs / ἐλευθερώνω
nitrate / 'naɪtreɪt / νιτρικό ἅλας

Exercises

I. Answer the following questions using one complete sentence for each answer:

1. What are macroelements?
2. What are microelements?
3. What is photosynthesis?
4. What affects the growth of roots?
5. How many classes of soils exist according to their chemical reactions?
6. What does the pH meter measure?
7. What makes soils vary in acidity?
8. What is the use of nitrogen?
9. Where can we find phosphorus in the plants?
10. What is released in the form of ammonia?

II. **Which is correct** in the following a, b or c?

1. In a normal soil aluminum represents about the- - - - - - - -
   a. 8.1%
   b. 5.1%
   c. 3.6%
2. The percentage of iron in a normal soil is about - - - - - - - -
   a. 8.1%
   b. 5.1%
   c. 3.6%

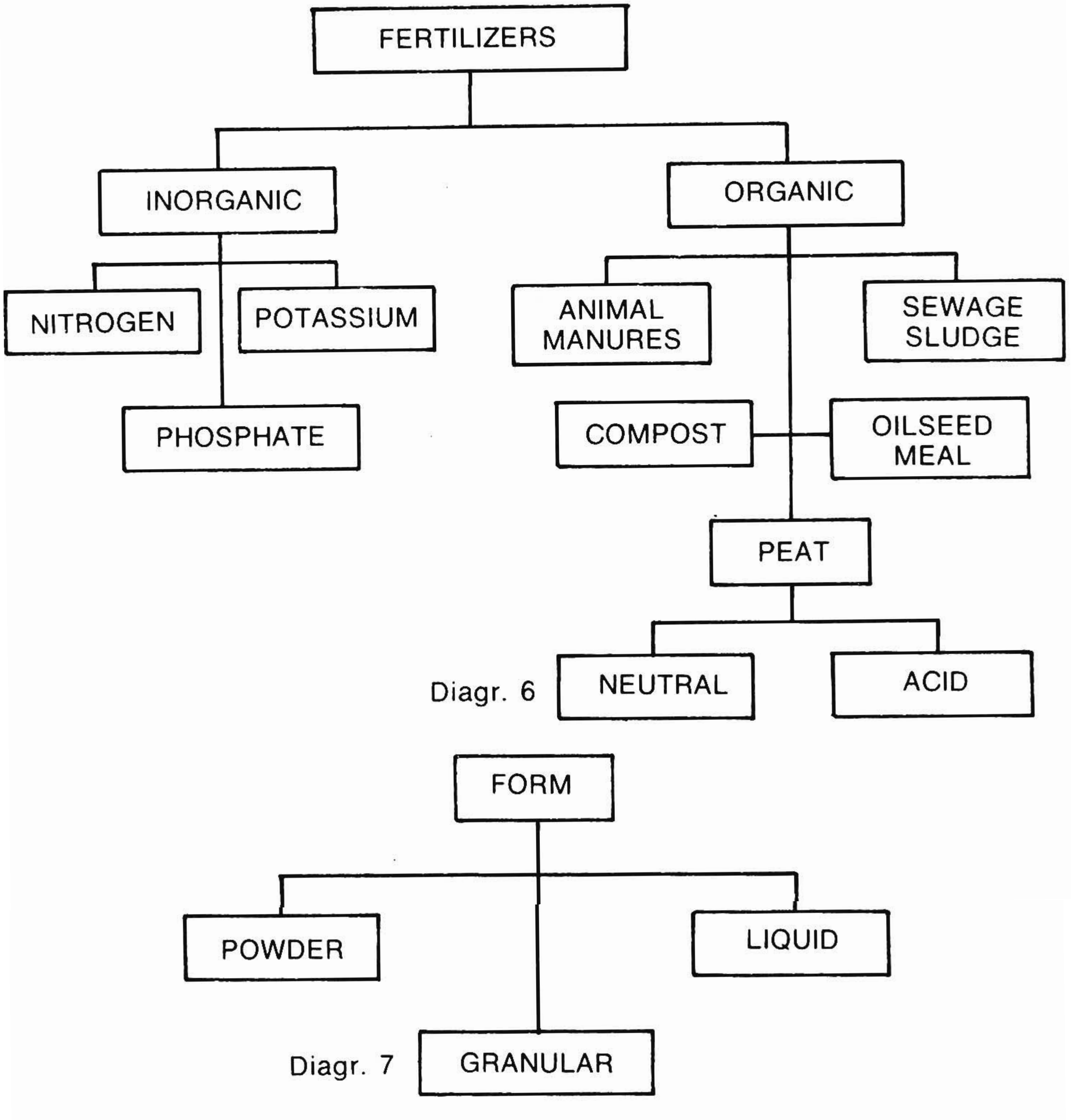
3. The amount of calcium in a normal soil is about - - - - - - - -
   a. 8.1%
   b. 5.1%
   c. 3.6%
4. Silicon, aluminum and iron are - - - - - - - -
   a. microelements.
   b. macroelements.
   c. micronutrients.
5. Macronutrients include - - - - - - - -
   a. sodium.
   b. cobalt.
   c. manganese.
6. The growth of roots is affected by...
   a. sulfur and magnesium.
   b. iron and magnesium.
   c. calcium and zinc.
7. Chlorophyll formation requires - - - - - - - -
   a. sulfur and magnesium.
   b. iron and magnesium.
   c. calcium and zinc.
8. Photosynthesis requires - - - - - - - -
   a. sulfur and magnesium.
   b. iron and magnesium.
   c. calcium and zinc.
9. Acid soils usually range from - - - - - - - -
   a. 0-6.5 pH.
   b. 6.6-7.3 pH.
   c. 7-3 and above.
10. Neutral soils usually range from - - - - - - - -
   a. 0-6.5 pH.
   B. 6.6-7.3 pH.
   c. 7.3 and above.
11. Alkaline soils usually range from - - - - - - - -
   a. 0-6.5 pH.
   b. 6.6-7.3 pH.
   c. 7.3 and above.

III. Match a word or phrase from column A with a word or phrase from column B to form true and correct statements:

A	B
1. Cell division requires	a. chlorophyll.
2. Photosynthesis requires	b. ammonia.
3. Plant and animal materials combine with water to give	c. calcium.
4. Nitrogen is released in the form of	d. root.
5. At maturity of the leaves nitrogen moves into the	e. nitrogen.
6. Chlorine gives plants their	f. colour.
7. Oxygen is a	g. seed.
8. Boron is a	h. carbonic acid solution.
9. Magnesium is needed in	i. macronutrient.
10. Sulfur is needed in	j. phosphorus.
	k. microelement.
	l. photosynthesis.
	m. chlorophyll format

FERTILIZERS AND MANURES

4.1a **Look at the following diagrams:**



Diagr. 6

Diagr. 7

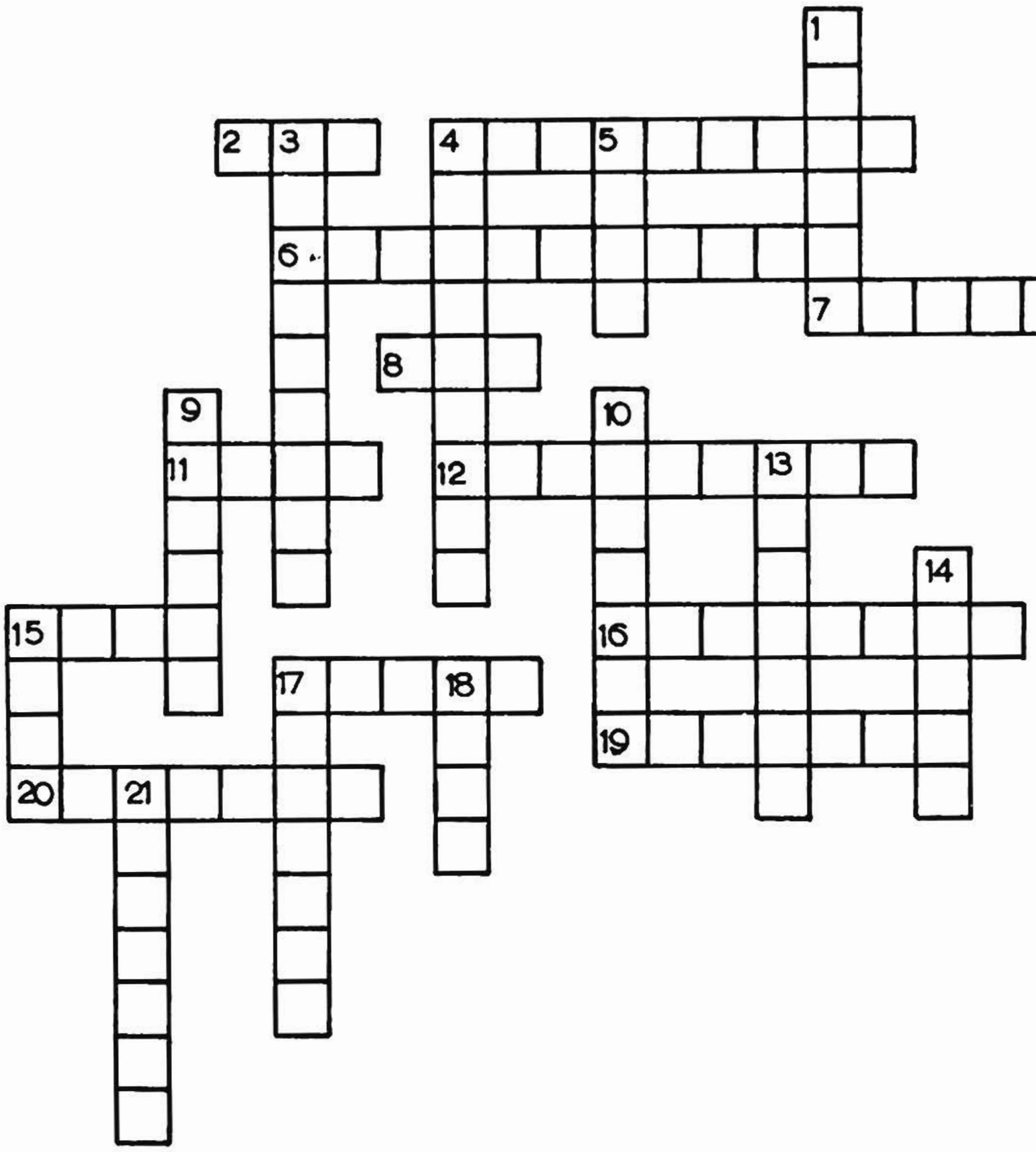
4.1b **Study the following statements:**

a. There are two kinds of *fertilizers*. The *inorganic* and the *organic* fertilizers.
b. There are three classes of inorganic fertilizers. The *nitrogenous, phosphatic* and *potassic*.
c. Inorganic fertilizers are very useful and we use *a lot of quantities* of them.
d. People use figures like *10-20-10* when they refer to fertilizers. These figures mean percentages of *nitrogen, phosphorus,* and *potassium*

e. Nitrogenous fertilizers include *Nitrate of Soda*, *Nitro-chalk*. *Sulphate of Ammonia* and *Chilean Potash Nitrate*
f. Nitrate of Soda contains 16% Nitrogen. It is a *quick-acting* stimulant. It is good for acid and peaty soils.
g. Nitro-chalk contains 15.5% Nitrogen. It has a *quick and sustained* effect. It does not make the soil sour.
h. Sulphate of Ammonia contains 21% Nitrogen. It is slightly *slower acting* than nitrate of soda. It takes 10 to 14 days in summer but more than that in winter to give results.
i. Sulplate of Ammonia makes the soil *acid*.
j. Chilean Potash Nitrate contains 15% Nitrogen. It is very *quick acting*.
k. Phosphatic Fertilizers include *super-phosphate of lime* and *basic slag*.
l. The superphosphate of lime is a very *popular* fertilizer.
m. We can use superphosphate of lime any time of the year, but it is more *effective* during spring and summer.
n. The *basic slag* is a *slow-acting* fertilizer. Its lime content helps to correct acidity.
o. Potassic fertilizers include *sulphate of potash* and *muriate of potash*.
p. The sulphate of potash is a very *popular* fertilizer. It is *safe* for all plants. We mix it with other fertilizers and give a *complete* feed before sowing or planting.
q. The muriate of potash is *suitable* for *a wide range* of plants. However, sometimes it may *damage* some kinds of plants.

4.1c **Fill in the blanks in the following sentences and solve the cross-word puzzle:**

1. Chilean - - - - - - - - Nitrate contains 15% Nitrogen.
2. You can find it in any percentage!
3. Some fertilizers are more - - - - - - - - in Spring and Summer.
4. (across) One class of inorganic fertilizer is the one containing - - - - - - - -
4 (down) Another class contains - - - - - - - -
5. Sulphate of Ammonia makes the - - - - - - - - acid.
6. There are two kinds of - - - - - - - -.
7. This kind of fertilizer - - - - - - - - to correct acidity.
8. We - - - - - - - - fertilizers to make the soils rich.
9. Some fertilizers may - - - - - - - - certain kinds of plants.
10. This is one kind of fertilizers.
11. We make the soil - - - - - - - - using Sulphate of Ammonia.
12. This is another kind of fertilizer.
13. Nitrogenous fertilizers include - - - - - - - - of Soda.
14. Nitrate of Soda is good for acid and - - - - - - - - soils.
15. (across) The basic - - - - - - - - is a kind of phosphatic fertilizer.
15. (down) Nitrate of - - - - - - - - contains 16% Nitrogen.
16. A third class of inorganic fertilizer contains - - - - - - - -
17. (across) Nitrogenous fertilizers include nitro - - - - - - - -
17. (down) There is a 15% nitrogen in the - - - - - - - - Potash Nitrate.
18. Phosphatic fertilizers include super - phosphate of - - - - - - - -
19. The lime - - - - - - - - of basic slag helps to correct the acidity of the soil.
20. Sulphate of - - - - - - - - contains 21% Nitrogen.
21. The - - - - - - - - of potash is suitable for a wide range of plants.



Vocabulary

fertilizer / ˈfɜtlaɪzə / λίπασμα
manure / məˈnjʊə / κοπριά
inorganic / inoˈgənɪk / ἀνόργανος
organic / ɔˈgænɪk / ὀργανικός
nitrogen / ˈnæɪtrədʒən / ἄζωτο
phosphate / ˈfosfeɪt / φωσφορικό ἅλας
potassium / pəˈtæsɪəm / κάλιο
sewage / ˈsjuɪdʒ / ἀποχετεύσεις, ἀκαθαρσίες
sludge / slʌdʒ / ἰλύς, ἀπόβλητα
compost / ˈkompost / κοπρόχωμα
oilseed / ˈɔɪl sid / λινόσπορος
meal / mil / ἀλεύρι
peat / pit / τύρφη
neutral / ˈnjutrl / οὐδέτερος
acid / ˈæsɪd / ξινός
powder / ˈpaʊdə / σκόνη
granular / ˈgrˌænjʊlə / κοκκώδης
liquid / ˈlɪkwɪd / ὑγρός
nitrogenous / ˈnæɪtrədʒənəs / ἀζωτοῦχος
phosphatic / fosfeɪtɪk / φωσφοροῦχος
potassic / pəˈtæsɪk / καλιοῦχος

quantity / kwontətɪ / ποσότητα
figure / 'fɪgə / ἀριθμός
percentage / pə'sentɪdʒ / ποσοστό
phosphorus / 'fosfərəs / φωσφόρος
nitrate / 'naɪtreɪt / νιτρικό ἅλας
soda / 'səʊdə / σόδα
nitro-chalk / 'naɪtrəʊ'tʃɔk / νιτροασβέστιο
sulphate / 'sʌlfeɪt / θειϊκό ἅλας
ammonia / ə'məʊnɪə / ἀμμωνία
Chilean Potash Nitrate / 'tʃɪlɪən 'potæʃ 'naɪtreɪt / νίτρο τῆς Χιλῆς
contain / kən'teɪn / περιέχω
quick acting / kwɪk 'æktɪŋ / ταχείας ἐνέργειας
stimulant / 'stɪmjʊlənt / τονωτικό
peaty / 'pitɪ / τυρφώδης
sustained / sə'steɪnɪd / συνεχής
effect / ɪ'fekt / ἀποτέλεσμα
sour / saʊə / ξινός
slightly / 'slaɪtlɪ / ἐλαφρά
slower / sləʊə / ἀργός
result / rɪ'zʌlt / ἀποτέλεσμα
include / ɪn'klʊd / περιλαμβάνω
superphosphate / 'supə'fosfeɪt / ὑπερφωσφορικό
lime / laɪm / ἄσβεστος
slag / slæg / σκωρία
popular / 'popjʊlə / ἀγαπητός, δημοφιλής
effective / ɪ'fektɪv / ἀποτελεσματικός
acidity / ə'sɪdətɪ / ὀξύτητα, ξινή γεύση
potash / 'potæʃ / ποτάσσα, ἀνθρακικό κάλιο
muriate / 'mjurɪət / ὑδροχλωρικό ἅλας
safe / seɪf / ἀκίνδυνος
mix / mɪks / ἀναμιγνύω
feed / fid / τροφή
sowing / 'səʊɪŋ / σπορά
planting / 'plæntɪŋ / φύτεμα
suitable / 'sutəbl / κατάλληλος
wide / waɪd / εὐρύς
range / reɪndʒ / ἔκταση
damage / 'dæmɪdʒ / βλάπτω

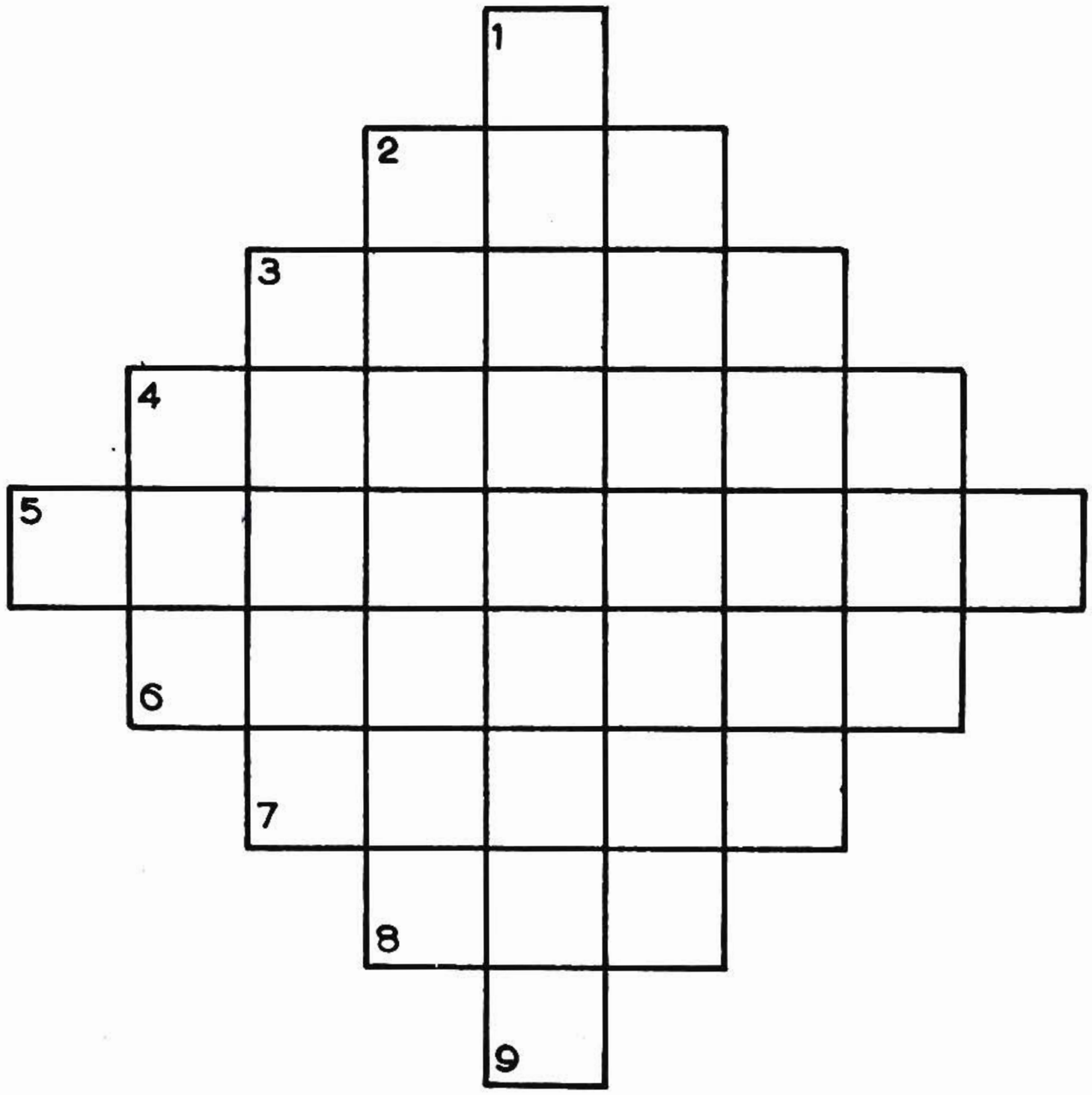
4.2a **Refer to the diagram 6 for the various classes of organic fertilizers.**

4.2b **Study the following statements:**

a. Organic fertilizers are of *animal or vegetable* origin.
b. Organic fertilizers usually supply *nitrogen*.
c. In this case, nitrogen is in the form of *protein*.
d. Organic fertilizers do not work *property* in sour, too wet or too cold soils.
e. *Organics* are generally *slow acting*. However, dried blood, fish meal and others work quite quickly in warm, moist soils.
f. Organics *do not scorch* foliage. They are *more expensive* than inorganic fertilizers and have *no fixed* composition.

g. According to the form fertilizers form, be either *powder* or *granular* or *liquid*.
h. Common *types of organic fertilizers* are neutral peat, acid peat, animal manures, compost, oilseed meal and sewage sludge.

4.2c **Fill in the squares in the following drawing according to the cues. The vertical squares from 1-9 give the name of one important class of fertilizers:**



1. It's the chemical sign for iodine.
2. Ending in the names of many chemicals.
3. Dried is a form of quick acting fertilizer.
4. We use - - - - - - - - of Soda as fertilizer of acid soils.
5. As fertilizers, they are very popular.
6. The other big class of fertilizers.
7. There is a wide - - - - - - - - of fertilizers.

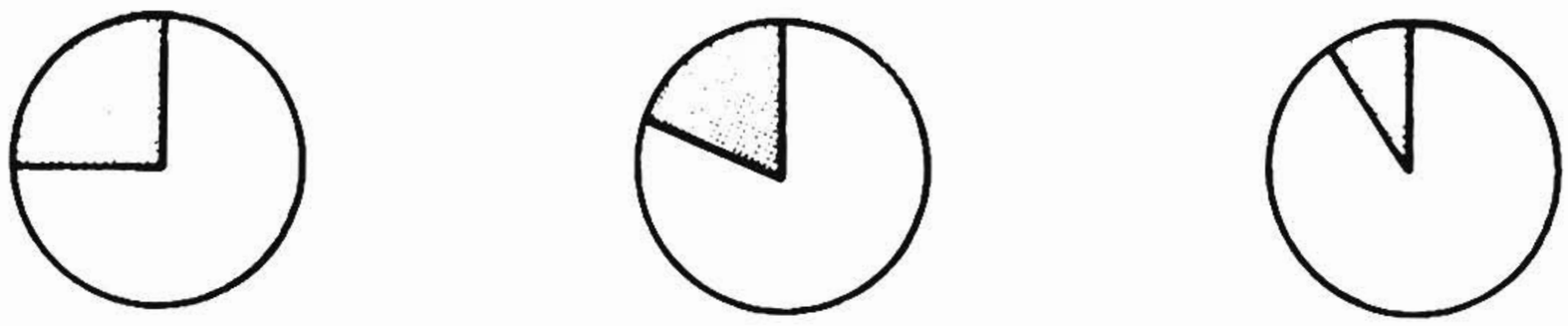
Vocabulary

animal / 'ænəml / ζῶο, ζωικός
vegetable / 'vedʒtəbl / φυτικός
origin / 'orədʒɪn / προέλευση
supply / sə'plaɪ / παρέχω
protein / 'prəʊtin / πρωτεΐνη
property / 'propətɪ / κατάλληλα
dried / draɪd / ξερός
blood / blʌd / αἷμα
fish meal / fɪʃ mil / ἰχθυάλευρο
moist / mɔɪst / ὑγρός
scorch / skɔtʃ / καίω, τσουρουφλίζω
foliage / 'fəʊlɪɪdʒ / φύλλωμα
fixed / fɪkst / σταθερός
composition / 'kompə'zɪʃn / σύνθεση

4.3a **Look at the following diagrams:**

Animal feces	+	urine	+	bedding materials	=	manure

diag. 8



Nitrogen Phosphorus Potassium

diag. 9

4.3b **Study the following statements:**

a. Manures usually consist of animal *feces* and *urine* plus *bedding materials*.
b. Farm animals naturally consume certain nutrients. What they void becomes very *fertile resource*.
c. Diagram 9 shows the *basic content* of the nutrients. It is nitrogen, phosphorus and potassium. The needs of the animals are 25% of nitrogen, 20% of phosphorus and 10% of potassium. The rest is voided.
d. Manures are subject to *great losses*. To reduce these losses we use some techniques, such as:
   i. adequate bedding in the stable to *absorb the urine*.
   ii. stacking under cover or in pits *to prevent leaching*.
   iii. quick *spreading* of the manure on fields and *incorporation* of it into the soil.
   iv. spreading of *preservative materials* in the stable.
e. Well-rotted manure is less *odorous*. It is *spread easily* and is less likely *to burn* plants.
f. However, rotted manure *wastes* the organic matter.
g. There is always a *great variety* of manure according to the kind of livestock, the methods of handling and storage.
h. Sometimes we *enrich* manures with chemical fertilizers.

4.3c **Consider the following:**

a. *Compost* is a product like a well-rotted animal manure.
b. It consists of *plant residues*, i.e. leaves, lawn clippings etc. soil, fertilizer and sometimes limestone.
c. There constituents are placed in *alternate layers* of residues, soil and fertilizer.
d. We must make the compost pile in *damp, shady* places and keep it *moist*.
e. The summer weather *decays* the compost heap.
f. This kind of compost is an excellent fertilizer.

4.3d **Fill in the blanks in the following sentences:**

1. Animal - - - - - - - - plus urine plus - - - - - - - - materials make up - - - - - - - -.
2. Of the nutrients, 75% of - - - - - - - -, 80% of - - - - - - - - and - - - - - - - - of potassium is voided.
3. We use some - - - - - - - - to - - - - - - - - the losses in the the effectiveness of manure.
4. Manure usually is - - - - - - - -
5. Sometimes manure - - - - - - - - the plants.
6. - - - - - - - - is a product like a well-rotted animal manure.
7. Compost consists of - - - - - - - - residues mainly.
8. The compost pile must be in - - - - - - - - and - - - - - - - - places.
9. The hot weather - - - - - - - - the - - - - - - - - heap.
10. Compost is an - - - - - - - - fertilizer.

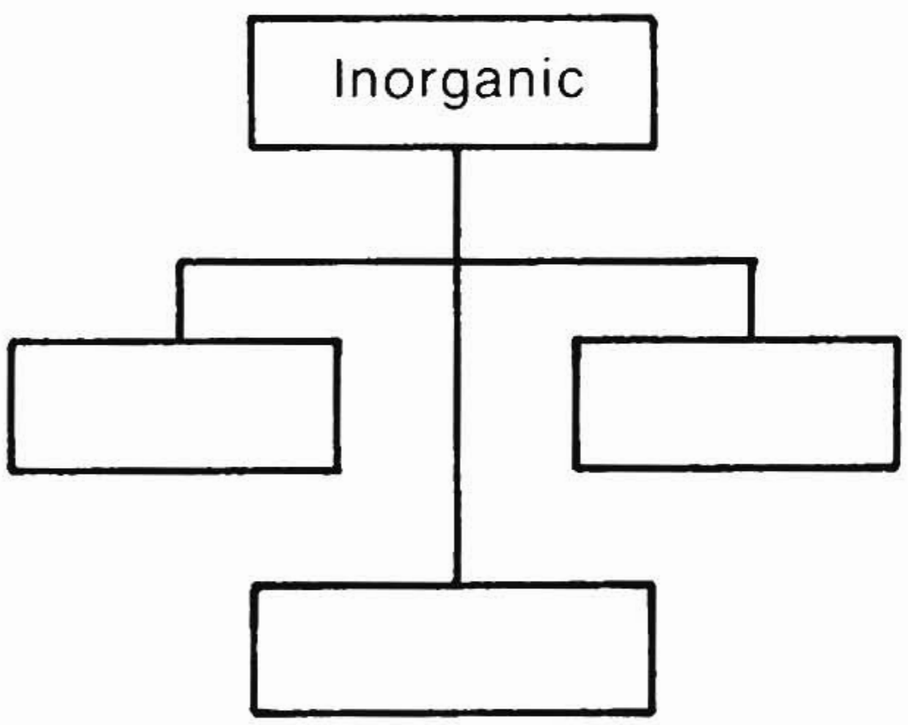
Vocabulary

feces / fisiz / περιττώματα
urine / 'jʊərɪn / οὖρα
bedding / 'bedɪŋ / στρωμνή (ζώου)
consume / kən'sjum / καταναλίσκω
void / vɔɪd / ἐκκενῶ, ἀποβάλλω
fertile / 'fɜtaɪl / εὔφορος
resource / rɪ'sɔs / πηγή
content / kən'tent / περιεχόμενο
subject to / 'sʌbdʒɪkt tə / ὑπόκειται σέ
loss / los / ἀπώλεια
reduce / rɪ'djus / μειώνω
technique / te'knik / τεχνική
adequate / 'ædɪkwət / κατάλληλος
stable / 'steɪbl / σταῦλος
absorb / əb'sɔb / ἀπορροφῶ
stack / stæk / στοιβάζω
pit / pɪt / λάκκος
prevent / prɪ'vent / ἐμποδίζω
leaching / litʃɪŋ / διαχωρισμός
spread / spred / ἁπλώνω
incorporation / ɪn'kɔpə'reɪʃn / ἀνάμειξη
preservative / prɪ'zɜvətɪv / συντηρητικός
rotted / 'rotɪd / σαπισμένος
odorous / 'əʊdərəs / δύσοσμος
burn / bɜn / καίω
waste / 'weɪst / καταστρέφω
variety / və'raɪətɪ / ποικιλία
livestock / 'laɪvstok / ζῶα
handling / 'hændlɪŋ / χειρισμός
storage / 'stɔzɪdʒ /ἀποθήκευση
enrich / ɪn'rɪtʃ / ἐμπλουτίζω
product / 'prodʌkt / προϊόν
residue / 'rezɪdju / ὑπόλειμμα
lawn / lɔn / χορτοτάπητας
clipping / 'klɪpɪŋ / ἀπόκομμα, ξακρίδι

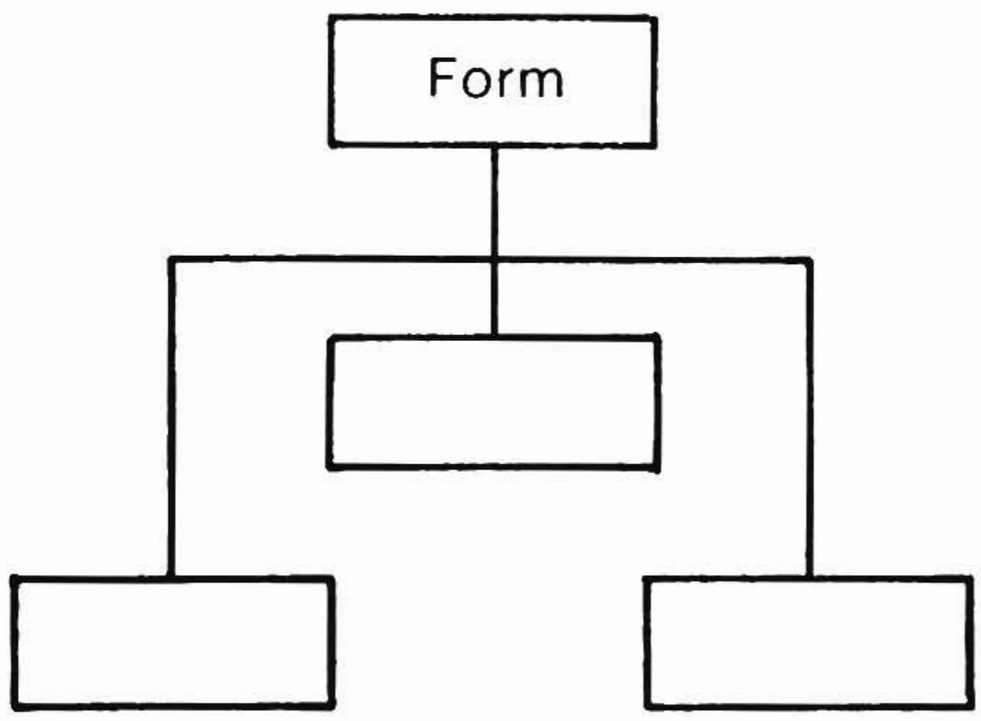
alternate / ˈɔltəneɪt / ἐναλλασσόμενος
layer / leɪə / στρώση
damp / dæmp / ὑγρός
shady / ˈʃeɪdɪ / σκιερός
decay / dɪˈkeɪ / σαπίζω
heap / hip / σωρός

Exercises

I. Fill in the squares with the relative terms:



diag. 10



diag. 11

II. Answer the following questions using one complete sentence for your answer:

1. How many kinds of fertilizers are there?
2. What does 10-20-10 mean in fertilizers?
3. What is the effect of Sulphate of Ammonia in the soil?
4. What do Phosphatic Fertilizers include?
5. When is superphosphate of lime more effective?
6. What is the use of lime content in the basic slag?
7. Which is the origin of organic fertilizers?
8. Do organic fertilizers scorch foliage?
9. Do organic fertilizers have fixed composition?
10. What is neutral peat?
11. What do manures consist of?
12. What kind of manure is wasteful of the organic matter?
13. What is compost?
14. What is the effect of summer weather in compost?
15. What sort of fertilizer is compost?

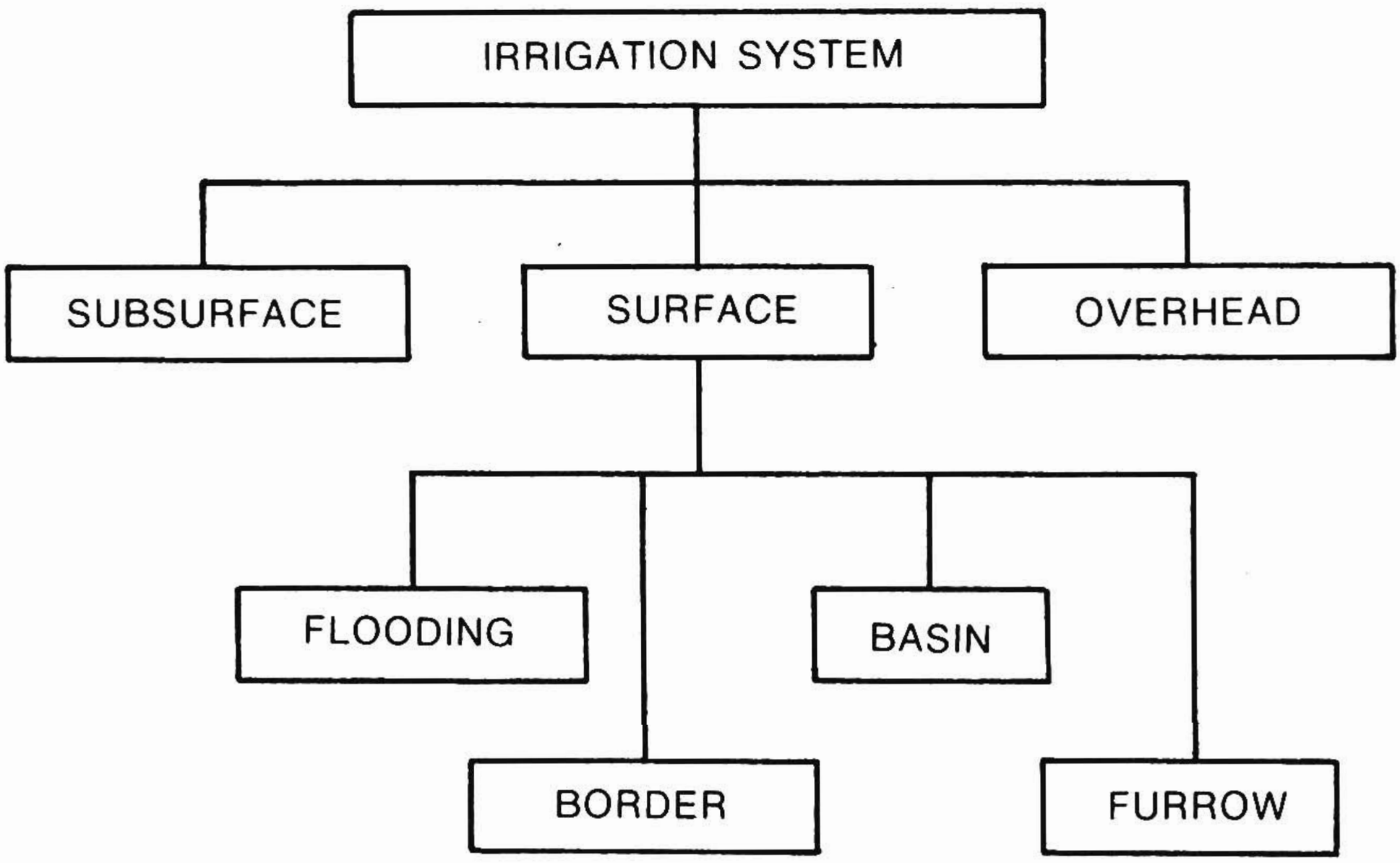
III. Match a word or phrase from column A with a word or phrase from column B to make sense:

A	B
1. Nitrate of Soda contains	a. a very popular fertilizer.
2. Sulphate of Ammonia is	b. a wide range of plants.
3. Chilean Potash Nitrate is	c. do not scorch foliage.
4. The Sulphate of potash is	d. a slow acting stimulant.
5. The muriate of potash is suitable for	e. a small range of plants.
	f. 16% Nitrogen.
6. Organics	9. more odorous.
7. Well-rotted manure is	h. scorch foliage.
8. Badly-rotted manure is	i. less odorous.
	j. a very quick acting stimulant.

UNIT A.5

IRRIGATION AND DRAINAGE

5.1a Look at the following diagram:



diagr. 12

5.1b Study the following statements:

a. Irrigation is the process of *supplying water* to land by means of ditches or pipes.
b. In the subsurface system the pipes are *under the ground*.
c. The subsurface system is an *expensive* system.
d. In the overhead system the pipes are some distance *above the plants*.
e. The method of surface flooding allows sheets of water to *flow down* a sloping field.

f. The method of furrow irrigation allows water to flow in *furrows between the rows* of a crop.
g. We construct *dams* to form lakes which we use in the basin irrigation method.
h. In the border irrigation method we hold water *within strips*.

5.1c **Say in which irrigation systems we use the following terms:**

under the ground	above the plants
flow down	sloping field
between the rows	dam
within strips	expensive

Vocabulary

irrigation / ˈɪrɪˈgeɪʃn / ἄρδευση
drainage / ˈdreɪnɪdʒ / ἀποστράγγιση
subsurface / ˈsʌbˈsɜfɪs / κάτω ἀπό τήν ἐπιφάνεια
surface / ˈsɜfɪs / ἐπιφάνεια
overhead / ˈəʊvəˈhed / ἐναέριος
flooding / ˈflʌdɪŋ / πλημμύρισμα, ἐκχείλιση
border / ˈbɔdə / ὄχθη
basin / ˈbeɪsn / λεκάνη
furrow / ˈfʌrəʊ / αὐλάκι
process / ˈprəʊses / μέθοδος, διαδικασία
supply / səˈplaɪ / παροχή
ditch / dɪtʃ / χαντάκι, ὄρυγμα
pipe / paɪp / ἀγωγός
sheets of water / ʃits əv ˈwɔtə / στρώματα νεροῦ
flow / fləʊ / ροή, ρέω
dam / dæm / φράγμα
strip / strɪp / λωρίδα

5.2a **Study the following drawings:**

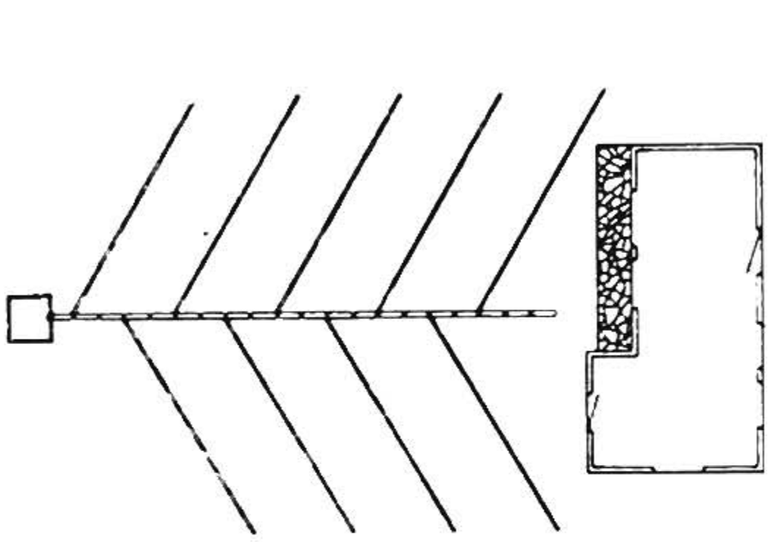


fig. 3

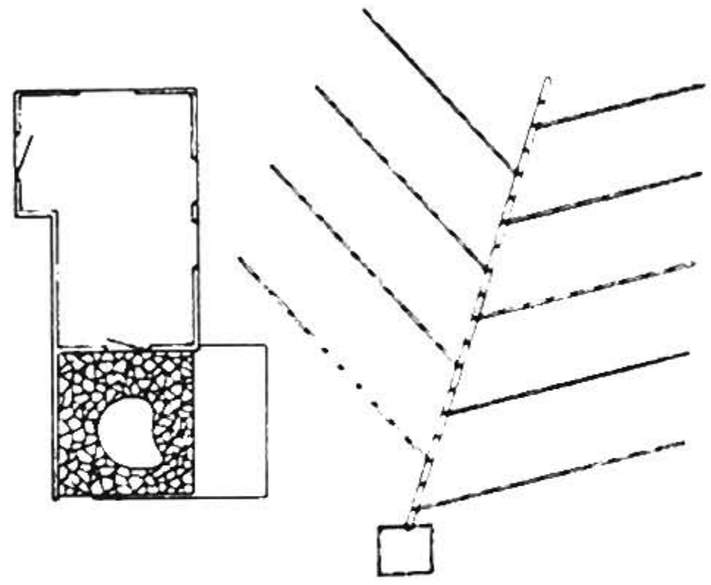


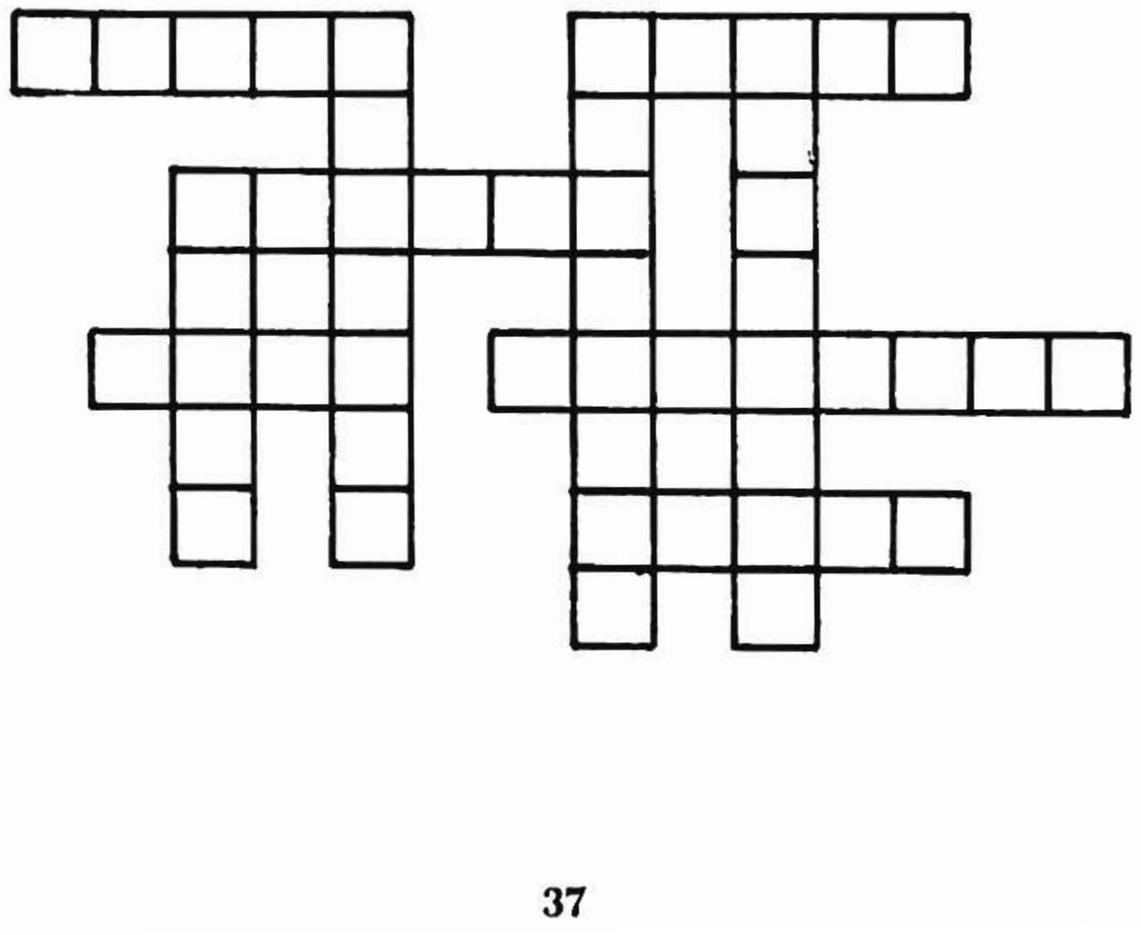
fig. 4

5.2b **Now consider these statements:**

a. One form of drainage is to remove all *surplus* water on soil by means of canals, ditches or conduits.
b. There are three basic types of drainage: *reclamation* of flooded areas, *drainage* of farm land and *disposal* of household or farm sewage.
c. There are many ways of *laying drains*.
d. Pipes *below the soil* give an effective form of drainage.
e. We can use *earthenware* or concrete pipes.
f. Figure 3 shows the lay out of pipes when there is *a slope away from* the house. The main drain runs into a *soakaway*.
g. Figure 4 shows the lay out of pipes when the garden slopes across its width. The main drain follows the *fall* of the land.
h. We usually call the side or branch drains *feathers*. They form a herring bone pattern.
i. There is a *problem* in many gardens. It is *where to take* the water running down to the end of the drain.
j. We either have a *ditch* where water flows into, or a *soakaway* which accepts the water.
k. Sometimes we do not use pipes for drainage, we dig *trenches*.

5.2c **Fill in the squares with the words that complete the following sentences:**

1. Water - - - - - - - - into ditches.
2. Sometimes we must remove all - - - - - - - - water on soil.
3. (across) We can use a soakaway or a - - - - - - - - to accept drainage water.
3. (down) - - - - - - - - of household sewage is one type of drainage.
4. We dig - - - - - - - - instead of using pipes for drainage.
5. (across) Sometimes the garden slopes - - - - - - - - its width.
5. (down) - - - - - - - - - - - - - - - - of herring is a pattern of "feathers".
6. Pipes below the - - - - - - - give an effective form of drainage.
7. There are pipes of earthenware and pipes of - - - - - - - -
8. There are such, where drainage is important.



Vocabulary

remove / rɪ'muv / ἀφαιρῶ
surplus / 'sɜpləs / πλεόνασμα
canal / kə'næl / κανάλι
conduit / 'kɔndɪt / ὀχετός
reclamation / 'reklə'meɪʃn /βελτίωση
flooded / 'flʌdɪd / πλημμυρισμένος
disposal / dɪ'spəʊzl / διάθεση
household / haʊshəʊld / οἰκιακός
sewage / 'sjuɪdʒ / ἀποχέτευση
lay / leɪ / τοποθετῶ
drain / dreɪn / ἀγωγός, σωλήνα ἀποχετεύσεως
effective / ɪ'fektɪv / ἀποτελεσματικός
earthenware / 'ɜθnweə / πήλινος
concrete / 'konkrit / μπετόν
pipe / paɪp / ἀγωγός
slope / sləʊp / κλίση, κατηφόρα
soakaway /səʊkə'weɪ / ἀπορροφητικός βόθρος
width / wɪdθ / πλάτος
feather / 'feðə / φτερό
herring bone / 'herɪŋ'bəʊn / ψαροκόκκαλο
pattern / *'pætn* / *σχέδιο*
trench / trentʃ / τάφρος, αὐλάκι

Exercises

I. Fill in the blanks in the sentences below using one of the following words:

over	pipes	under
supplying	below	above
between	earthenware	laying
feathers	herring	form

1. The pipes are - - - - - - - - the ground in the subsurface system.
2. Irrigation is the process of - - - - - - - - water by means of ditches or - - - - - -
3. In the - - - - - - - - system the pipes are above the plants.
4. In the furrow irrigation method water flows - - - - - - - - the rows of a crop.
5. There are many ways of - - - - - - - - drains.
6. We use - - - - - - - - or concrete pipes.
7. We call the side drains - - - - - - - - and they - - - - - - - - a - - - - - - - - bone pattern.

II. Say whether the following sentences are TRUE or FALSE:

— 1. The subsurface system is cheap.
— 2. In the method of surface flooding, water flows down a sloping field.
— 3. In the border irrigation method we hold water within strips.
— 4. There is one type of drainage only.
— 5. In every garden we need both a ditch and a soakaway.
— 6. We can dig trenches instead of using pipes for drainage.

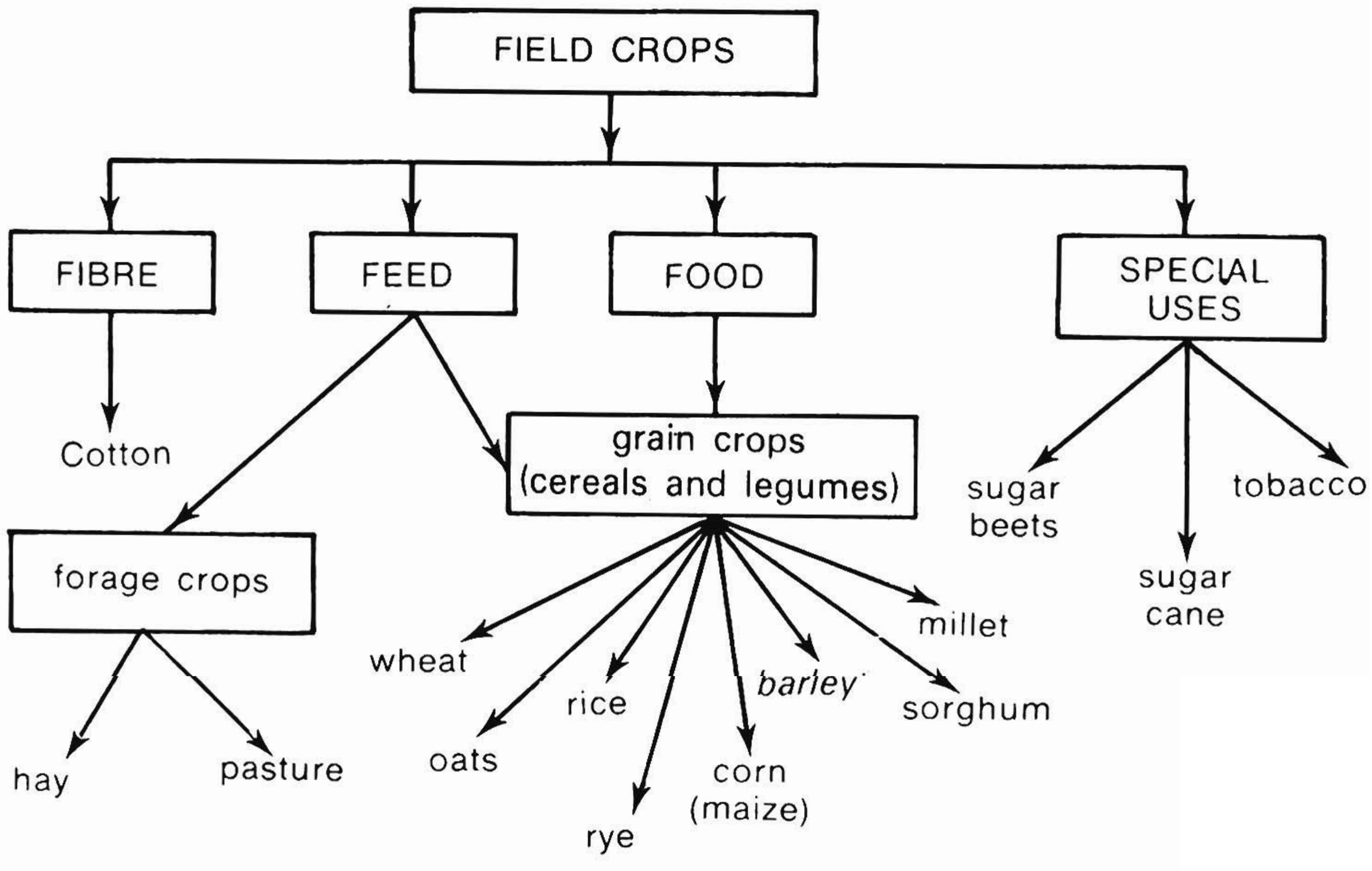
III. Match a word or phrase from column A with a word or phrase from column B to form true and correct sentences:

A	B
1. In the subsurface system	a in the surface flooding system.
2. In the overhead system	b in the basin irrigation method.
3. Water flows down a sloping field	c. the pipes are over the ground.
4. Water flows in furrows	d. in the border irrigation method.
5. We use lakes	e. between the rows of a crop.
6. We use strips	f. the pipes are under the ground.
	g. the pipes are above the plants.

UNIT A.6

FIELD CROPS

6.1a Look at the following diagram:



diag. 13

6.1b Study the following statements:

a. We grow *field crops* for food, feed, fibre and some special uses.
b. Cotton is a *fibre crop*.
c. Sugar beets, sugar cane and tobacco are crops of *special use*.
d. The cereals are grains we use for *food*.
e. When we speak of *feed*, we mean animal food.
f. Cotton is a *plant*. It produces fibres which we use to make fabrics.

g. Cotton grows in warm *climates.*
h. We use forage crops as *food for farm animals.*
i. Hay is a kind of *grass.* We often store it in a stack out-of-doors.
j. *Pasture* is also a kind of grass. Animals eat it in fields.
k. In areas where *rice* grows there are some irrigation problems.
l. We use *rye* to make bread.
m. We also use *wheat* to make bread.
n. *Oats* is a type of grain. It grows in cool climates. We use oats for horses and *oatmeal* for human beings.
o. *Corn* is a plant of warm climates mainly.
p. Sometimes we use *barley* to make bread.
q. The stalk of *sorghum* contain a sweet juice.
r. *Millet* is a cereal crop. There are a lot of types for it.
s. *Sugar beet* is a plant with high sugar content.
t. *Sugar cane* is a tall tropical grass.
u. *Tobacco* as a plant is useful for its leaves. We use them for smoking.
v. *Fibre* is any thread - like material.

6.1c. **The phrases or sentences on the right part of the page are the definitions of the terms on the left part of the page. Match the terms with the respective definitions.**

Terms	Definitions
1. crop	a. food for farm animals.
2. cotton	b. a type of grain.
3. feed	c. any grain we use for food.
4. forage	d. a cereal crop.
5. hay	e. we sometimes make bread with it.
6. cereal	f. a tall tropical grass.
7. wheat	g. We use its leaves for smoking.
8. rice	h. product of agriculture.
9. oats	i. a vegetable with high sugar content.
10. maize	j. its stalks contain a sweet juice.
11. barley	k. food for animals.
12. sorghum	l. we make bread with it too.
13. sugar cane	m. its name is also corn.
14. sugar beets	n. a kind of grass.
15. tobacco	o. a fibre crop.

Vocabulary

field / 'fild / χωράφι, άγρός
fibre / faɪbə / ΐνα, κλωστή
cotton / 'kotn / μπαμπάκι
feed / fid / ζωοτροφή, βοσκή
forage / 'foridʒ / νομή, ζωοτροφές
crop / krop / καλλιέργεια, φυτεία
hay / heɪ / σανός
pasture / 'pastʃə / βοσκή
food / fʊd / τροφή
grain / greɪn / κόκκος, σιτηρά
cereal / 'sɪəriəl / δημητριακά
wheat / wit / στάρι
oats / əʊts / βρώμη
rice / raɪs / ρύζι
rye / raɪ / σίκαλη
corn / kɔn / καλαμπόκι
maize / meɪz / καλαμπόκι

barley / 'bɑlɪ κριθάρι
sorghum / 'sɔgəm / σόργο
millet / 'mɪlɪt / κεχρί
sugar / 'ʃʊgə / ζάχαρη
beet / bit / τεῦτλο
cane / keɪn / καλάμι (sugar cane ζαχαροκάλαμο)
tobacco / tə'bækəʊ / καπνός
plant / plænt / φυτό
fabrics / 'fæbrɪks / ὑφάσματα
climate / 'klɑɪmɪt / κλίμα
store / stɔ / ἀποθηκεύω
stack / stæk θημωνιά
out-of-doors / 'ɑʊt-əv-dɔz / ὑπαίθριος
oatmeal / 'əʊtmil / ἀλεύρι βρώμης
stalk / stɔk βλαστός
sweet / swit / γλυκός
juice / dʒus / χυμός

6.2a **Study the following statements:**

a. There are a lot of *varieties* of wheat.
b. We can classify them by the number of *chromosomes*.
c. We call wheat with fourteen chromosomes *diploids*, and with forty two chromosomes *hexaploids*.
d. The variety of wheat we use for *bread* is hexaploid.
e. Some types of wheat are: the *durum, emmer, Polish, and poulard*. These are tetraploids. One diploid variety is the *einkorn*.
f. The types of wheat vary in the time they mature, in the yield (amount of wheat produced) and in the height.
g. Following are five figures of some types of wheat.
Figure 5 is the *durum* type, figure 6 is the *einkorn* type, figure 7 is the *emmer* type, figure 8 is the *Polish* type and figure 9 is the *poulard* type.

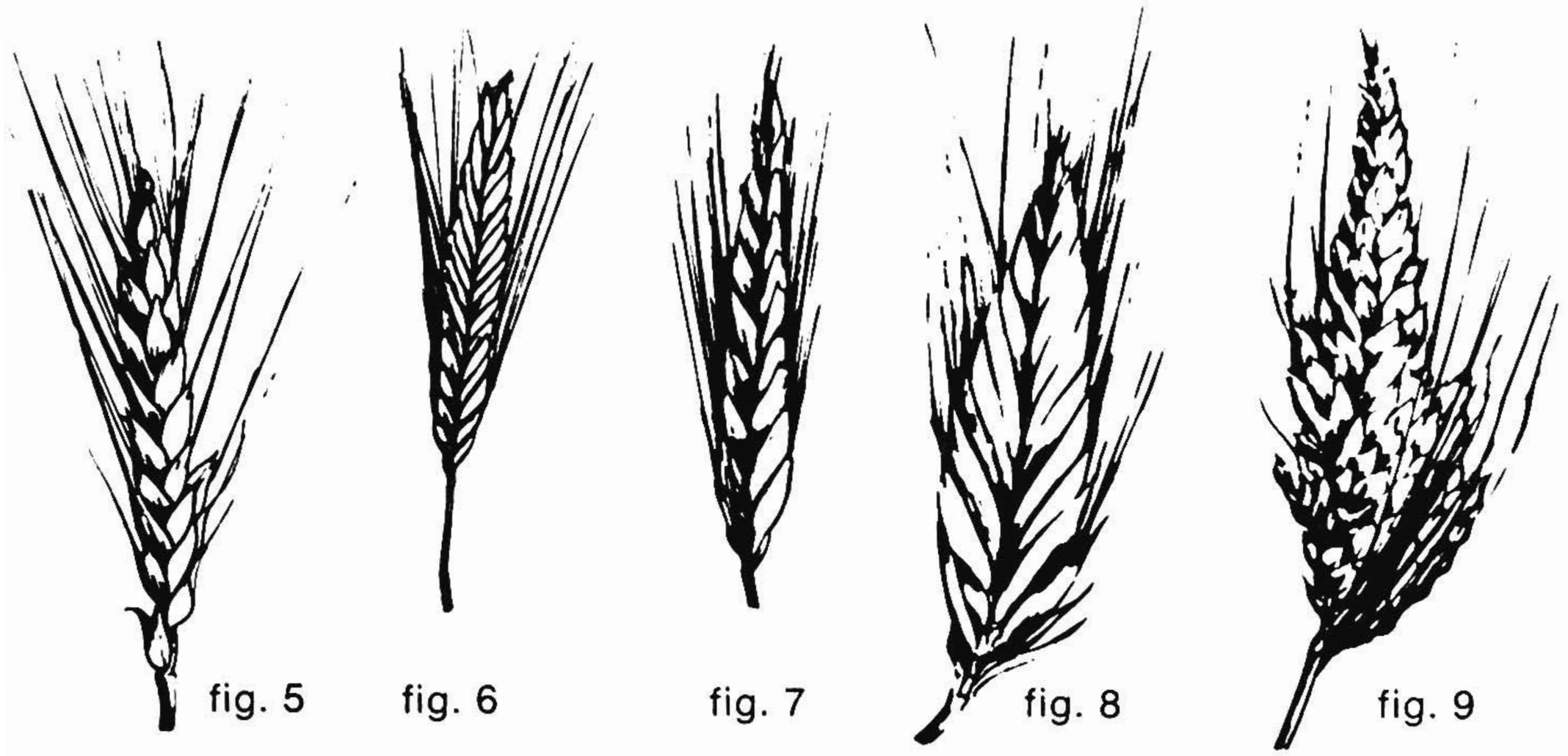


fig. 5 fig. 6 fig. 7 fig. 8 fig. 9

h. The heads of the different varieties of wheat take *different shapes*. They are *oblong* (fig. 10), *fusiform* (fig. 11), *clavate* (fig. 12) or *elliptical* (fig. 13).

oblong

fig. 10

fusiform

fig. 11

clavate or club-shaped

fig. 12

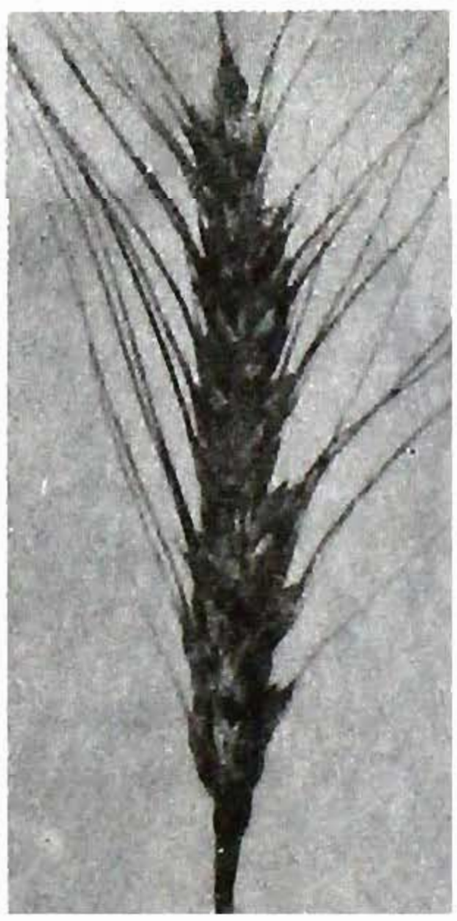
elliptical

fig. 13

i. Another distinction of the wheat is according to the beard or awn. So, we have *awned* spikes (fig. 14), *tip-awned* (fig. 15), or *awnless* (fig. 16).

j. The colour of the *glume* may also be different. It may be white, yellow, brown, or black.

k. The *kernels*, also, vary in colour, size, texture, hardness and shape of the furrow.



awned

fig. 14

tip-awned

fig. 15

awnless

fig. 16

6.2b **Match a term from column A with a term from column B to make sense:**

A	B
1. diploids	a. a tetraploid type.
2. tetraploids	b. type of wheat head.
3. hexaploids	c. type of wheat beard.
4. emmer	d. fourteen chromosomes.
5. einkorn	e. type of kernel.
6. fusiform	f. a diploid type.
7. awnless	g. seven chromosomes.
8. furrow	h. twenty-one chromosomes.

Vocabulary

variety / və'raɪətɪ / ποικιλία
classify / 'klæsɪfaɪ / ταξινομῶ
chromosome / 'krəʊməsəʊm / χρωμόσωμα
diploid / dɪ'plɔɪd / διπλοειδής
tetraploid / 'tetrəplɔɪd / τετραπλοειδής
hexaploid / 'heksə'plɔɪd / έξαπλοειδής
durum / 'dʌrəm / σκληρός
emmer / 'emə / δίκοκκο σιτάρι
Polish / 'pɔlɪʃ / Πολωνικός
poulard / 'pulad / διογκωμένος
einkorn / 'aɪnkɔn / μονόκοκκος
mature / mə'tʃʊə / ὡριμάζω
yield / jild / παραγωγή /απόδοση
shape / ʃeɪp / σχῆμα
oblong / 'oblɔŋ / ἐπιμήκης
fusiform / 'fjuzɪfɔm / ἀτρακτοειδής
clavate / 'klævet / ραβδωτός
elliptical / ɪ'lɪptɪkl / ἐλλειπτικό
distinction / dɪstɪŋkʃn / διάκριση
beard / 'bɪəd / γένι
awn / ɔn / ἄγανο (γένι σταχυοῦ)
spike / spaɪk / στάχι
tip-awned / 'tɪp 'ɔnd / μέ ἀκιδωτό ἄγανο
awnless / 'ɔnlɪs / χωρίς ἄγανο
glume / glum / λέπυρο
kernel / kɜnl /κόκκος
texture / 'tekstʃə / σύσταση
furrow / 'fʌrəʊ / αὐλάκι

6.3a **Study the following statements:**

a. There are *winter and spring* varieties of rye.
b. Rye grows *quickly*.
c. We use rye to make *bread* and also *whiskey*.
d. The kernel of rye is long and thin. It is *longer* and *thinner* than the kernel of wheat.
e. The colour of the *kernel* may be yellow, yellow-green, green, or blue-green.

f. There are winter and spring varieties of *barley*, as well.
g. We use barley to make bread and *brew beer*.
h. We also use it as *livestock feed*.
i. The *spike* of barley is the same like that of wheat.
j. We call *six-rowed* barley that with three spikelets per spike (fig. 17). All these spikelets are *fertile*.
k. In *two-rowed* barley the central spikelets are *fertile*, the two side spikelets are sterile (fig. 18).

fig. 17

fig. 18

6.3b **Sort out the following sentences into two groups according to whether they refer to RYE or BARLEY:**

1. It grows quickly.
2. The central spikelets are fertile.
3. We make whiskey with it.
4. Its spike is like that of the wheat.
5. We use it as livestock feed.
6. We use it to brew beer.
7. The colour of its kernel is yellow.
8. The six-rowed type has three florets per spike.

Fig. 19

Vocabulary

whiskey / wiskɪ / ούίσκυ
brew / bru / παρασκευάζω (μπύρα)
six-rowed / 'sɪks 'rəʊd / εξάστοιχο
spikelet / μικρό στάχυ
fertile / 'fɜtaɪl / γόνιμος
sterile / 'steraɪl / στείρος

Fig. 20

6.4a **Study the following statements:**

a There are two types of rice. The *upland* rice and the *lowland* rice.
b. Upland rice grows *without* flooding.
c. Lowland rice germinates and grows only *under* water.
d. The rice varieties differ in *height*, and in the *time of maturity*.
e. Apart from food, rice is very useful for its *by-products*.
f. When we remove the husk and before milling the rice we call it *brown*.
g. *Oats* grow in rather cool climates, whereas rice requires a tropical climate.
h. There are two types of oats. The *unilateral* (fig. 19) and the *equilateral* (fig 20).
i. Some of the seeds of oats are *covered* and some are *naked*.

j. Covered oats have two to four *florets* in each spikelet but naked varieties may have six to eight.
k. The *glume* of oats may be black, gray, red, yellow or white.
l. The *awns* may be *geniculate*, *subgeniculate* or *straight*.
m. We often mix oats flour with other foods because of its *antidioxidant* quality and high *vitamin* content.

6.4b **Match a term from column A with a definition from column B to make sense:**

A	B
1. Upland rice	a. With equal sides.
2. Lowland rice	b. Not straight; bent.
3 By-product	c. Without-husks but not milled.
4. Unilateral	d. Not covered.
5. Equilateral	e. Rice growing without flooding.
6. Naked	f. Not bent.
7. Geniculate	g. Not basic product.
8. Quality	h. Growing on one side only.
9. Brown rice	i. Characteristic.
10. Straight	j. Rice growing under water.

Vocabulary

upland / 'ʌplænd / ὀρεινός
lowland / 'ləʊlænd / πεδινός
germinate / 'dʒɜmɪneɪt / βλαστάνω
by-product / 'baɪ 'prodʌkt / ὑποπροϊόν
husk / hʌsk / λεπυρίδια
mill / mɪl / ἀλέθω
brown / braʊn / καφέ /καστανό
unilateral / juni'lætrl / μονόπλευρος
equilateral / i'kwɪ'lætrl / ἰσόπλευρος /αμφίπλευρος
covered / 'kʌvə(r)d / καλυμμένος
naked / 'neɪkɪd / ἀκάλυπτος, γυμνός
geniculate / dʒe'nikjʊlət / κεκαμμένος
subgeniculate / 'sʌbdʒe'nikjʊlət / ἡμικεκαμμένος
antidioxidant / 'æntɪ'daɪ'oksaɪdənt / ἀντιδιοξειδικό

6.5a **Study the following statements:**

a. Corn grows in *warm* climates.
b. There are *seven* types of corn:
dent, flint, flour, sweet, pop, waxy and pod.
c. There are *dwarf* types and *prolific* types.
d. We grow corn as a *grain crop* but we also use it for *forage*.
e. We can cut mature corn plants by *hand* or *machine* and place them in shocks or stooks.
f. Corn is a *monoecious* plant. The *staminate* flowers are in the tassel and the *pistillate* ones are on the ends of the shanks.
g. There are several kinds of *sorghum* with different uses. We grow sorghum for its *grain*, for *forage*, for its *juice*, or for its *panicle brush*.

h. Sorghums are rather warm weather plants.
i. We call the sweet sorghum *sorgo*.

6.5b **Say whether the following statements refer to corn or sorghum or both:**

1. We use it for forage.
2. It grows in warm climates.
3. Its sweet type is sorgo.
4. There are dwarf and prolific types.
5. It is a monoecious plant.
6. There are seven types of it.
7. It is also a grain crop.

Vocabulary

dent / dent / οδοντοειδής
flint / flint / σκληρόκοκκος
pop / pop /
waxy / 'wæksɪ / κέρινος
pod / pod / μικρόκοκκος/κηρώδης
dwarf / dwɔf / νάνος
prolific / prə'lɪfɪk / γόνιμος
shock / ʃok / θημωνιά
stook / stʊk / σωρός, δεμάτια
monoecious / mo'niʃjəs / μόνοικος
staminate / 'stæmɪnət / άνθος μέ στήμονα/αρσενικό άνθος
tassel / 'tæsl / φόβη
pistillate / 'pɪstlət / θηλυκό άνθος
shank / ʃæŋk / στέλεχος
panicle / 'pænɪkl / φούντα
sorgo / 'sogəʊ /γλυκό σόργο

6.6a **Study the following statement:**

a. The *sugar cane* is a tropical *perennial crop*.
b. These canes grow in *bunches*. We call these bunches stools.
c. The sugar canes have *inflorescences* like a corn tassel.
d. The cane requires *8 to 24 months* to reach maturity.
e. *Harvesting* is by hand or machine.
f. The cane *deteriorates* rapidly.
g. The *sugar beet* is a different kind of plant.
h. It is a *biennial* plant and grows in cool climate.
i. The sugar comes from the *root*.
j. The sugar *content* is about 16-20%. However, the cane is the *largest* source of sugar.
k. *Perennials* live for more than two years and *biennials* for two years.

6.6b **Match a word or phrase from column A with a phrase or sentence from column B to give a correct definition:**

A	B
1. sugar cane	a. it has roots with high sugar content.
2. perennial	b. it lives for two years.
3. stool	c. the flowering part of a plant.
4. sugar beet	d. it has very warm climate.
5. biennial	e. it lives for more than two years.
6. inflorescence	f. gather crops.
7. tropical	g. bunch.
8. harvest	h. it is a tropical plant.

Vocabulary

perennial / pə'renɪəl / πολυετής
bunch / bʌntʃ / δέσμη
stool / stul / παραφυάδα
inflorescence / 'ɪnflə'resns / ταξιανθία
harvest / 'hɑvɪst / συγκομιδή
deteriorate / dɪ'tɪərɪəreɪt / υποβαθμίζομαι
biennial / bɑɪ'enɪəl / διετές φυτό
rapidly / 'ræpɪdlɪ / γρήγορα
root / rut / ρίζα

6.7a **Study the following statements:**

a. There are *quite a few* types of cotton.
b. All the varieties have *about the same* kind of flower, creamy white with three triangular *bracts* (fig. 21).
c. The *bolls* (fig. 22) vary in size and we classify them as small, medium, or large.
d. The length of the fibre *depends* on the size of the boll to some varieties.
e. The plant requires *warm* temperatures, *even* rainfalls, and *a lot* of sunshine.
f. *Tobacco* also requires warm temperature and does not withstand drought or excess moisture.
g. We usually sow the plants in beds and *transplant* them either to a field or to a shade.
h. We use a *shade* to protect the plants from too much sun.
i. It usually *takes* tobacco *75-120 days* from transplating *to mature*.
j. There are two methods of *harvesting* tobacco. In the first, which we call *priming*, we remove the leaves from the plant. In the second, we *cut* the entire stalk.
k. *Drying curing barn* comes after priming or cutting. We hung up the leaves or stalks in the and when necessary we speed up drying.

fig. 21

fig. 22

6.7b **Complete the blanks in the following sentences with one of these words:**

bolls	creamy	bracts
rainfalls	warm	drought
shades	transplant	matures
priming	cutting	drying
curing		

1. The flowers of cotton are -------- white with triangular --------
2. The plant has -------- of various sizes.
3. Cotton grows in -------- climates with evenly distributed . . .
4. Tobacco requires also warm temperatures and does not withstand --------
5. We usually -------- the tobacco plants and use -------- to protect them from too much sun.
6. Tobacco -------- within 75-120 days from transplanting.
7. There are three stages from harvesting to having the ready product. They are -------- or --------, then -------- and finally --------

Vocabulary

quite a few / kwaɪt ə fju / πολλά
creamy / krimɪ / χρώματος κρέμ
bract / brækt / βράκτειο
boll / bol / κάρυο (βαμβακιοῦ)
depend / dɪ'pend / ἐξαρτῶμαι
even / ivn / ὁμαλός, ὁμοιόμορφος
rainfall / 'reɪnfɔl / βροχόπτωση
withstand / wɪð'stænd / αντέχω
drought / draʊt / ξηρασία, ἀνομβρία
moisture / 'mɔɪstʃə / ὑγρασία
transplant / træns'plant / μεταφυτεύω
shade / ʃeɪd / σκίαστρο
priming / 'praɪmɪŋ / κοπή ὥριμων φύλλων
stalk / stɔk / βλαστός, στέλεχος
drying / draɪŋ / ξήρανση
curing barn / 'kjʊrɪŋ'ban / ξηραντήριο
speed (up / spid (ʌp) / ἐπιταχύνω

Exercises

I. Which is correct in the following a, bo rc ?

1. Cotton is a--------
   a. forage crop.
   b. grain crop.
   c. fibre crop.
2. Feed means --------
   a. animal food.
   b. food for human beings.
   c. both "a" and "b".
3. Oats is a type of --------
   a. fibre crop.
   b. forage crop.
   c. grain crop.
4. Sugar beet has a --------
   a. high sugar content.
   b. low sugar content.
   c. no sugar content.

5. Diploids is a type of wheat with--------
   a. fourteen chromosomes.
   b. twenty-eight chromosomes.
   c. fourty two chromosomes.
6. The variety of wheat einkorn is --------
   a. hexaploid.
   b. diploid.
   c. tetraploid.
7. The types of wheat vary in the --------
   a. time of maturity
   b. yield and height.
   c. both "a" and "b"
8. Awnless is a distinction of wheat according to--------
   a. the beard.
   b. the shape of the head.
   c. the kind of the kernel.
9. The spike of barley is the same like that of--------
   a. rye.
   b. cotton.
   c. wheat.
10. We call the barley with three spikelets node of the spike . . . .
   a. three-rowed
   b. six-rowed.
   c. two-rowed.
11. Lowland rice germinates and grows--------
   a. under water.
   b. without water.
   c. both "a" and "b".
12. Covered oats have -------- florets, in each spikelet
   a. two
   b. four
   c. two to four
13. There are dwarf types and prolific types of--------
   a. corn.
   b. sorghum.
   c. oats.
14. Special use crops include--------
   a. sugar beets and sugar cane.
   b. tobacco.
   c. both "a" and "b".
15. The cereals are grains we use for---------
   a. feed.
   b. food.
   c. fabrics.
16. The sugar cane requires -------- to mature.
   a. 3-6 months
   b. 8-24 months
   c. 36 months
17. We take sugar from the -------- of sugar beets.
   a. leaves
   b. flowers
   c. roots

18. The wheat we use for bread is--------
    a. hexaploid.
    b. diploid.
    c. tetraploid.

19. We use rye to make---------
    a. beer.
    b. whiskey.
    c. both "a" and "b".

20. There are--------types of oats.
    a. seven
    b. four
    c. two

21. Corn grows in---------
    a. warm climates.
    b. tropical climates.
    c. cool climates.

22. Sorgo is the name for --------
    a. sweet sorghum.
    b. sugar cane.
    c. sugar beets.

II. Say whether the following are TRUE or FALSE

— 1. The cereals are grains we use for food.
— 2. Cotton grows in cool climates.
— 3. The variety of wheat we use for bread is hexaploid.
— 4. The heads of the different varieties of wheat are the same.
— 5. Rye grows quickly.
— 6. We use rye in beer brewing.
— 7. In the six-rowed barley all florets are fertile.
— 8. Oats grow in rather cool climates.
— 9. All the seeds of oats are naked.
— 10. Dent is a type of corn.
— 11. Cotton is fibre crop.
— 12. Hay is forage crop.
— 13. Barley isn't a cereal.
— 14. The sugar cane deteriorates quickly.
— 15. Millet is a cereal crop.
— 16. The sugar beet is a biennial plant.
— 17. Cotton may be a fabric.
— 18. Pasture is not a kind of grass.
— 19. Sugar cane is a grass.
— 20. Sugar beet is a vegetable.
— 21. All types of wheat mature at the same time.
— 22. We use barley only for livestock feed.
— 23. The rice varieties differ in height only.
— 24. Oats flour has antidioxidant quality.
— 25. We cut corn plants by hand or machine.
— 26. The roots of sugar beets have 16-20% sugar.
— 27. There is only one type of cotton.

III. Answer the following questions using one complete sentence for each answer:

Why do we grow field crops?
What happens in areas where rice grows?
What do the stalks of sorghum contain?
What do we use tobacco leaves for?
What is fibre?
What are the colours of the kernels of rye?
What do we use barley for?
How many types of rice are there?
Which are they?
How many types of corn are there?
Which are the uses of sorghum?
What is a perennial?
What is a biennial?
What is the brown rice?

FRUIT

7.1a **Study the following table**

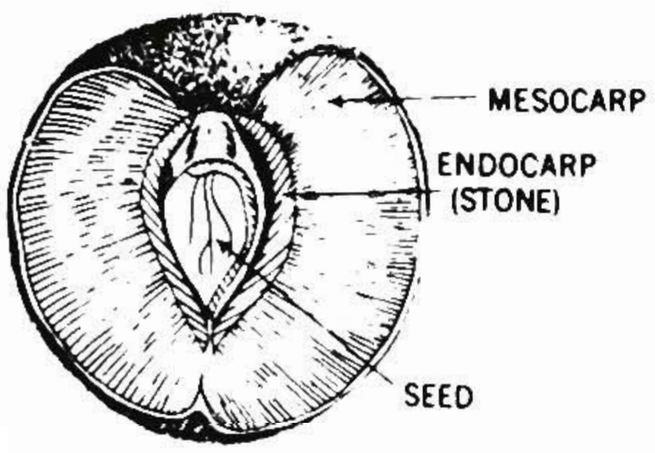
Major types	Structure			
	One carpel	Two or more carpels	Two or more carpels plus stem axis or floral tube	Carpels plus stem axis or floral tube and parts
Dry Indehiscent	Caryopsis corn wheat Achene anemone Legume peanut	Silique radish Samara elm Nut hazelnut chestnut	Achene sunflower Schizocarp carrot	
Dry Dehiscent	Folliche milkweed Legume pea bean	Capsule onion poppy Silique cabbage Silicle pepper-grass	Capsule iris	
Dry-Fleshy	Drupe plum peach almond	Drupe coconut	Pome apple pear Aggregate straw-berry	Multiple (pseudocarp) fig
Fleshy	Berry May-apple Hesperidium orange lime	Berry tomato grape	Inferior berry blue-berry Pepo cucumber water-melon	Multiple. pineapple

Table 3

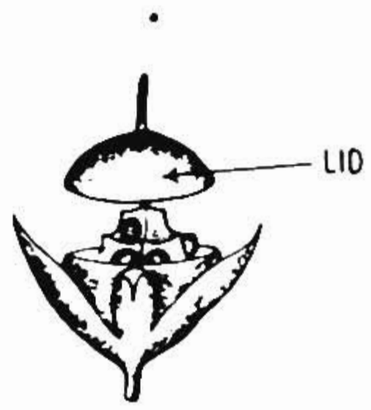
7.1b **Consider the following statements:**

a. According to the *botanical* sense a fruit is the *ripened ovary* of a plant, an *angiosperm*, containing or enclosing seeds.
b. *Nuts*, many *vegetables* and other *flowers* are *fruits*.
c. A fruit is the *final result* of plant reproduction.
d. There are a lot of different kinds of fruit. A *dry indehiscent* fruit is the one that *does not open* upon maturity. A *dry dehiscent* fruit is the one that *opens* upon maturity. In the *dry fleshy* type the ovary wall becomes a *drupe*. It has three layers — a thin outer skin, a thick central layer and a hard, stony interior layer. In the *fleshy* type the ovary wall becomes *soft* at maturity. We call it *berry*.
e. Certain fruits require *tropical* climates. Such fruits are: bananas, pineapples etc.
f. Other fruits require *subtropical* climates. Such fruits are oranges, lemons, grapefruit, dates, avocados etc.
g. An other class requires *temperate* climates: apples, pears, peaches, apricots, etc.
h. The plants *retaining* their foliage through out the year are *evergreen* plants.
i. We use commercial *fertilizers* to make fruiting plants *vigorous*.
j. Most fruit plants require *ample* soil *moisture*.
k. Nearly all fruit plants are subject to attack by *diseases* and *insects*. Parasitic furıgi, bacteria or viruses cause these diseases.
l. Chemical *fungicides* are available to control most fungus diseases.

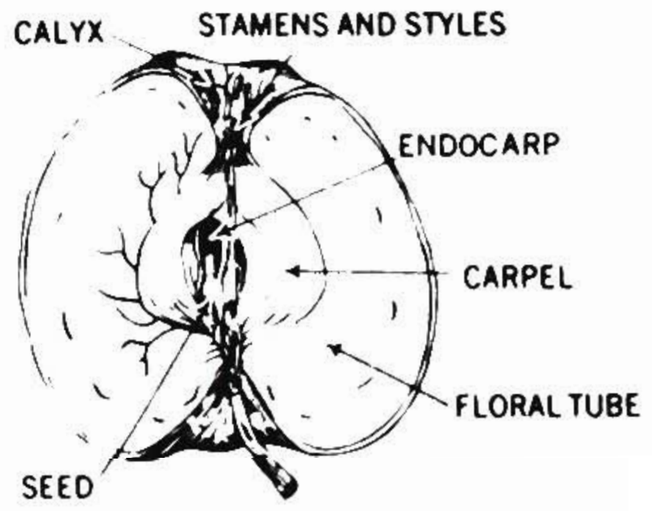
7.1c **Look at the following figures and complete the sentences:**



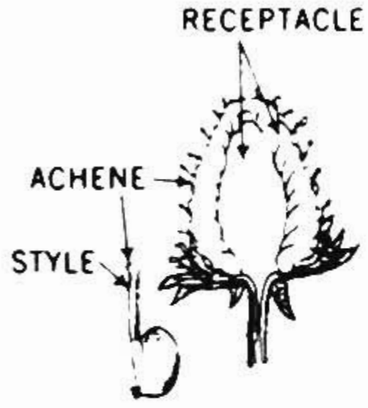
The Peach-A Drupe
fig. 23



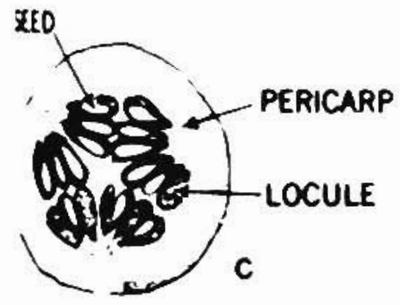
The Poppy Fruit - A Capsule
fig. 24



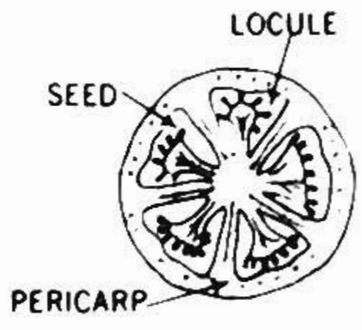
The Apple - A Pome
fig. 26



The Strawberry
An accessory fruit
fig. 25



Cucumber — A pepo
fig. 28



Tomato — A berry
fig. 27

1. Fig. 23 shows a peach. It belongs to the -------- type. It is a drupe.
2. Fig. 24 shows a poppy fruit. It belongs to the -------- type. It is a capsule.
3. Fig. 25 shows a strawberry. It belongs to the -------- type. It is an accessory fruit.
4. Fig. 26 shows an apple. It belongs to the -------- type. It is a pome.
5. Fig. 27 shows a tomato. It belongs to the -------- type. It is a berry.
6. Fig. 28 shows a cucumber. It belongs to the -------- type. It is a pepo.

Vocabulary

structure / 'strʌktə / δομή
carpel / kapl / καρπόφυλλο
stem / *stem* / *βλαστός*
axis / 'æksɪs / ἄξονας
floral / florl / ἄνθινος/ανθικός
tube / tjub / σωλήνας
accessory / ək'sesərɪ / ἐξάρτημα, παρεπόμενο
dry / draɪ / ξηρός
indehiscent / indihɪsnt / μή διαρρηγνυόμενος
caryopsis / kærɪ'opsɪs / καρύοψη
achene / ə'kin / ἀχαίνιο
anemone / ə'neməni / ἀνεμώνη
legume / lɪ'gjum / ψυχανθές
peanut / 'pinʌt / φιστίκι αράπικο
silique / sɪ'lik / κέρας
radish / 'rædɪʃ / ραπάνι
samara / sæmərə / σαμάρα
elm / elm / πτελέα
hazelnut / 'heɪzlnʌt / φουντούκι
chestnut / 'tʃestnʌt / κάστανο
sunflower / 'sʌnflaʊə / ἡλίανθος
schizocarp / 'skɪtsəʊkap / σχιζοκάρπιο
carrot / 'kærət / καρότο
dehiscent / di'hɪsnt / διαρρηγνυόμενος
follicle / 'folɪkl / θύλακος
milkweed / mɪlk'wid / ζωχός, γαλατσίδα
capsule / 'kæpsjul / κάψα
pea / pi / μπιζέλι
bean / bin / φασόλι
onion / 'ʌnɪən / κρεμμύδι
poppy / 'popɪ / παπαρούνα
cabbage / 'kæbɪdz / λάχανο
silicle / 'sɪlɪkl / κεράτιο
pepper-grass / 'pepə 'gras / κάρδαμο
iris / 'aɪərɪs / ἶρις, κρίνος
fleshy / 'fleʃɪ / σαρκώδης
drupe / drup / δρύπη
plum / plʌm / δαμάσκηνο
coconut / 'kəʊkənʌt / ινδική καρύδα
multiple / 'mʌltɪpl / πολλαπλός
pseudocarp / sjudəʊkap / ψευδοκάρπιο
peach / pitʃ / ροδάκινο

almond / 'aməɳd / ἀμύγδαλο
pear / peə / ἀχλάδι
aggregate / 'ægrigeit / ἑνοποιημένος, συσσωματωμένος
strawberry / 'strɔbri / φράουλα
fig / fig / σύκο
berry / 'beri / καρπός χωρίς πυρήνα
may apple / 'mei'æpl / ποδόφυλλο
grape / greip / σταφύλι
hesperidium / 'hespəridiəm / ἑσπεριδοειδές
lime / laim / κίτρο
inferior / in'fiəriə / κατώτερος
blueberry / blubri / βαγκίνιο
pepo / 'pepəu / πεπονιά
cucumber / 'kjukʌmbə / ἀγγούρι
watermelon / 'wɔtə'melən / καρπούζι
pineapple / 'painæpl / ἀνανάς
botanical / bətænikl / βοτανικός
ripened / 'raipənt / ὥριμος
ovary / 'əuvəri / ὠοθήκη
angiosperm / 'ændʒios'pɜm / ἀγγειόσπερμα
vegetable / 'vedʒtəbl/ λαχανικό
reproduction / 'riprə'dʌkʃn / ἀναπαραγωγή
grapefruit / 'greipfrut / γκρέιπφρουτ
date / deit / χουρμάδα
avocado / 'ævə'kadəu / ἀβοκάντο
temperate / 'temprət / εὔκρατος
apricot / 'eiprikot / βερύκοκκο
retain / ri'tein / κρατῶ, διατηρῶ
foliage / 'fəuliidʒ / φύλλωμα
evergreen / 'evəgrin / ἀειθαλής

fertilizer / 'fɜtlaizə / λίπασμα
vigorous / 'vigərəs / ρωμαλέος
ample / 'æmpl / ἐπαρκής
disease / di'ziz / ἀσθένεια
insect / 'insekt / ἔντομο
parasitic / 'pærə'sitik / παρασιτικός
fungus / 'fʌŋgəs / μύκητας
bacterium / bæktiəriəm / βακτηρίδιο
virus / 'vaiərəs / ἰός
fungicide / 'fʌŋgisaid / μυκητοκτόνο

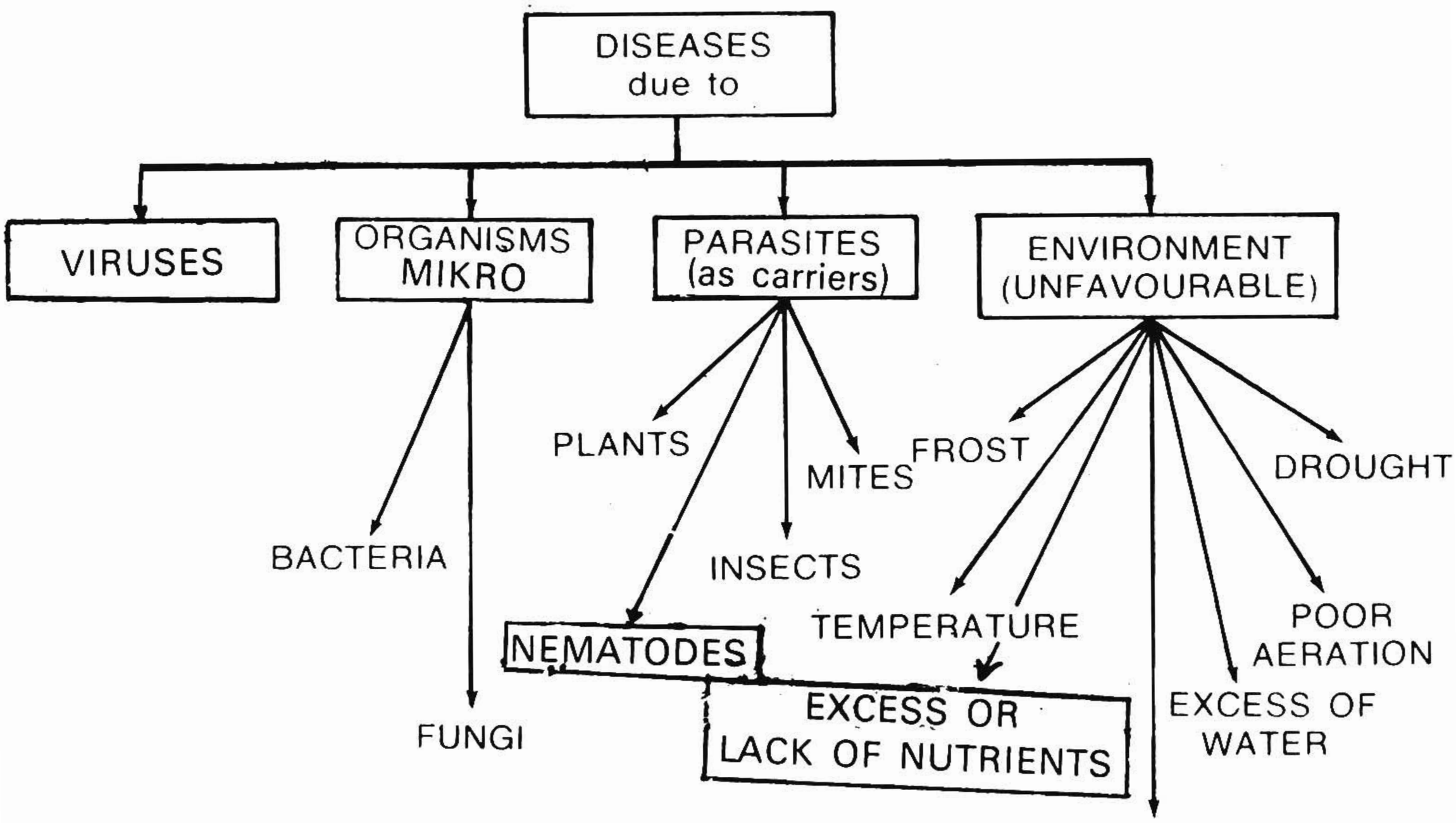
EXERCISES

I. Answer the following questions using one complete sentence for each answer:

1. What is fruit according to the botanical sense?
2. What is a dry indehiscent fruit?
3. Which fruits require tropical climate?
4. Which fruits require temperate climates?
5. How do we make fruiting plants vigorous?
6. Which are evergreen plants?
7. What kind of climate do oranges and avocados require?
8. What sort of soil do fruits usually require?
9. What causes the various diseases to the fruit plants?
10. What do chemical fungicides do?

PLANT DISEASES

8.1a **Look at the following diagram:**



diag. 14

8.1b **Study the following statements:**

a. All kinds of plants are subject to certain *diseases*.
b. We identify the various diseases by the *symptoms* of the affected plants.
c. The various diseases are due to *disease causing* organisms such as bacteria, fungi, viruses and nemotode worms.
d. They are also due to *parasitic organisms*, that is higher plants, insects and mites.
e. Finally, an important cause, is the *unfavourable environment*.
f. Apart from symptoms, the diagnosis of a disease depends on identification of the *causative agent*.
g. Bacteria and fungi cause *similar symptoms* — leaf spots, blights, tumours, rots, wilts etc.
h. Sometimes, however, the spots on the leaves have a *nonparasitic* cause, such as wind burn or sun scorch.
i. *Nematode worms* in the soil cause yellowing of the plants or lack of vigour.
j. Insects are very important as *carriers* of viruses.
k. Certain *flowering plants* are sometimes parasitic on other plants.
l. Injury from *frost* is very common. Even low temperatures may cause damage.

m. Too high *temperatures* may cause sun scald to the leaves.
n. *Drought* often causes stunting, wilting or burning.
o. *Insufficient oxygen* causes damage to the roots.
p. An *excess of water* on a warm day after a cool night may cause serious damages. *Abundant moisture*, on the other hand, favours infection by bacteria and fungi.
q. *Poor aeration* is also a cause of non-parasitic diseases.

8.1c **Consider the following statements:**

a. There are four basic *principles* to control diseases. They are: *exclusion, eradication, protection* and *immunization*.
b. With the term exclusion we mean the *prevention* of entrance and establishment of *pathogens* in uninfected gardens or areas in general.
c. The term *eradication* means the elimination of pathogens after their establishment on a plant or in an area.
d. When we deposit a protective chemical on the surface of a plant before the arrival of a fungus we speak of *protection*.
e. *Immunization*, finally, includes chemotherapy and the breeding of resistant varieties of plants. *Chemotherapy* is the injection of a chemical into a plant to neutralize the toxic effect.

8.1d **Following is a list of diseases. Put the letter "O" before the names of diseases caused by organisms, the letter "P" before diseases caused by parasites and the letter "E" before diseases caused by environment.**

leaf spots		**blights**	**tumours**
rots		**wilts**	**yellowing**
sun scald		**stunting**	**burning**
root damage			

Vocabulary

nematode / 'nemətəʊd/ νηματώδης
parasite / 'pærəsaɪt/ παράσιτος
mite / maɪt/ άκαρι (αραχνοειδής οργανισμός)
unfavourable / ʌnfeɪvrəbl/ δυσμενής
frost / frost / παγετός, παγωνιά
aeration / eəreɪʃn / εξαερισμός
identify / aɪ'dentɪfaɪ / αναγνωρίζω
symptom / 'sɪmptəm / σύμπτωμα
affect / ə'fekt / επηρεάζω
worm / wɜm / σκουλήκι
diagnosis / 'daɪəg'nəʊsɪs / διάγνωση
identification / aɪ'dentɪfɪ'keɪʃn / αναγνώριση
causative / 'kɔzətɪv / αίτιολογικός
agent / 'eɪdʒnt / μέσο
spot / spot / κηλίδα
blight / blaɪt / σήψη από μύκητα
tumour / 'tjumə / όγκος

rot / rot / άποσυντίθεμαι
wilt / wɪlt / μαραίνομαι
non-parasitic / 'non 'pærə'sɪtɪk / μή παρασιτικός
burn / bɜn / καίω
scorch / skɔtʃ / καψαλίζω /νεκρώνω
yellowing / 'jeləʊɪŋ / κιτρίνισμα
carrier / 'kærɪə / φορέας
scald / skɔld / κάψιμο
stunting / 'stʌntɪŋ / άναχαίτιση
wilting / 'wɪl'tɪŋ / μαρασμός
abundant / 'əbʌndənt / ἄφθονος
exclusion / ɪk'skluʒn / ἀποκλεισμός
eradication / ɪ'rædɪ'keɪʃn / ξερρίζωμα /εξολόθρευση
protection / prə'tekʃn / προστασία
immunization / 'ɪmjʊnaɪ'zeɪʃn / ἀνοσοποίηση
prevention / prɪ'venʃn / πρόληψη
entrance / 'entrəns / εἴσοδος
establishment / ɪ'stæblɪʃmənt / ἐγκατάσταση
pathogen / 'pəθodʒən / παθογόνος
uninfected / 'ʌnɪn'fektɪd / ἀμόλυντος
elimination / ɪ'lɪmɪneɪʃn / ἀποβολή, ἐξαφάνιση
protective / prə'tektɪv / προστατευτικός
chemotherapy / 'keməʊθerəpɪ / χημειοθεραπεία
breeding / 'bridɪŋ / ἀναπαραγωγή
injection / ɪn'dʒekʃn / ἔγχυση
neutralize / 'njutrlaɪz / οὐδετεροποιῶ
toxic / 'tɔksɪk / τοξικός
infection / in'fekʃn / μόλυνση

8.1d **Here are now some of the more important symptoms of plant diseases:**

a. Change in colour	Leaves turn from normal green to pale green or yellow.
b. Shot hole in leaves	Small holes in leaves caused by fungi and toxic agents.
c. Wilt	Fall over of plants due to lack of water or injury to the supporting stems.
d. Necrosis	Death of the entire plant or part of it.
e. Hypertrophy	An increase of size of cells.
f. Hyperplasia	An increase in the number of cells.
g. Mummification	Drying or shriveling of fruits.
h. Dropping	Leaves, blossoms and fruits.

Vocabulary

shot / ʃot / τρύπα (shot hole - σκολύτης)
fall over / fɔl əʊvə / πτώση
supporting / sə'pɔɪtɪŋ / ὑποστήριξη
stem / stem / στέλεχος
necrosis / nɪ'krəʊsɪs / νέκρωση
entire / ɪn'taɪə / ὁλόκληρος
hypertrophy / haɪ'pɜθrofɪ / ὑπερτροφία
increase / 'ɪnkris / αὔξηση
hyperplasia / haɪpɜ'pleɪzɪə / ὑπερπλασία
mummification / 'mʌmɪfɪ'keɪʃn / μομιοποίηση
shriveling / 'ʃrɪvlɪŋ / συρρίκνωση
dropping / 'dropɪŋ / πέσιμο

Exercises

I. Say whether the following statements are TRUE or FALSE

— 1. Diseases affect some plants only.
— 2. Bacteria are disease causing organisms.
— 3. Insects are parasitic organisms.
— 4. The symptoms of bacteria and fungi are different.
— 5. The spots on the leaves are always due to parasitic organisms.
— 6. Frost is a common cause of injury.
— 7. Too high temperatures do not damage plants.
— 8. Moisture favours infection by fungi.
— 9. Drought is a cause of diseases of plants.
— 10. Winds or the sun sometimes damage plants.

II. Match a word or phrase from column A with a word or phrase from column B to form true and correct sentences:

A	B
1. Plants are sometimes- - - - - - - -	a. damage to the roots.
2. Nematode worms- - - - - - - -	b. elimination of pathogens.
3. Insufficient oxygen may be an- - - - - - - - -	c. chemotherapy.
4. The diagnosis of a disease depends on- - - - - - - -	d. increase in the number of cells.
5. The symptoms of bacteria and fungi- - - - - - - -	e. lack of water.
6. Yellowing of plants is due to- - - - - - - -	f. neutralizes the toxic effect.
7. Insects are often- - - - - - - -	g. parasitic organisms.
8. Drought often causes- - - - - - - -	h. a non parasitic disease.
9. Insufficient oxygen causes- - - - - - - -	i. small holes in leaves.
10. Exclusion means- - - - - - - -	j. death of a plant.
11. Eradication means- - - - - - - -	k. unfavourable environment for plants.
12. Protection- - - - - - - -	l. are similar.
13. Immunization includes- - - - - - - -	m. identification of the causative agent.
14. Hypertrophy means- - - - - - - -	n. parasitic.
	o. damage to the plants.
	p. disease causing organisms.
	q. infection by bacteria.

15. Hyperplasia means- - - - - - - -
16. Necrosis means- - - - - - - -
17. Wilt is due to- - - - - - - -
18. Fungi sometimes cause- - - - - - -
19. Poor aeration is a cause of- - - - - - -
20. Chemotherapy- - - - - - - -
21. Flowering plants may be- - - - - - -
22. Unfavourable environment causes- - - - - - -
23. Mites are- - - - - - - -
24. Viruses are- - - - - - - -
25. Sun scorch may cause- - - - - - - -
26. Abundant moisture favours- - - - -

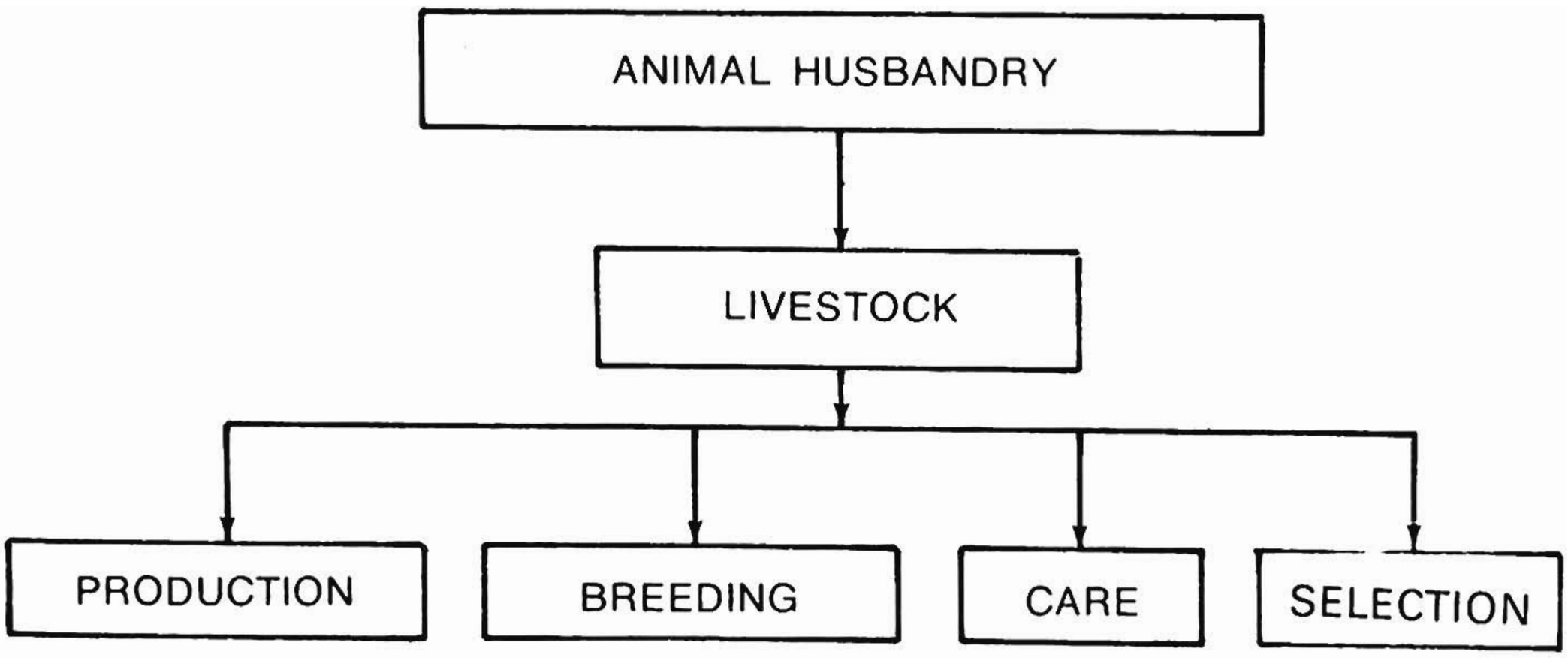
r. spots on the leaves of plants.
s. parasitic organisms.
t. stunting.
u. nematode worms in the soil.
v. prevention of entrance of pathogens in gardens.
w. increase of size of cells.
x. is a principle to control diseases.
y. carriers of viruses.
z. cause diseases to plants.

III. Diseases are due to certain organism parasites and unfavourable environment. In front of the following terms put the letter "O" for organisms, the letter "P" for parasites and the letter "E" for environment.

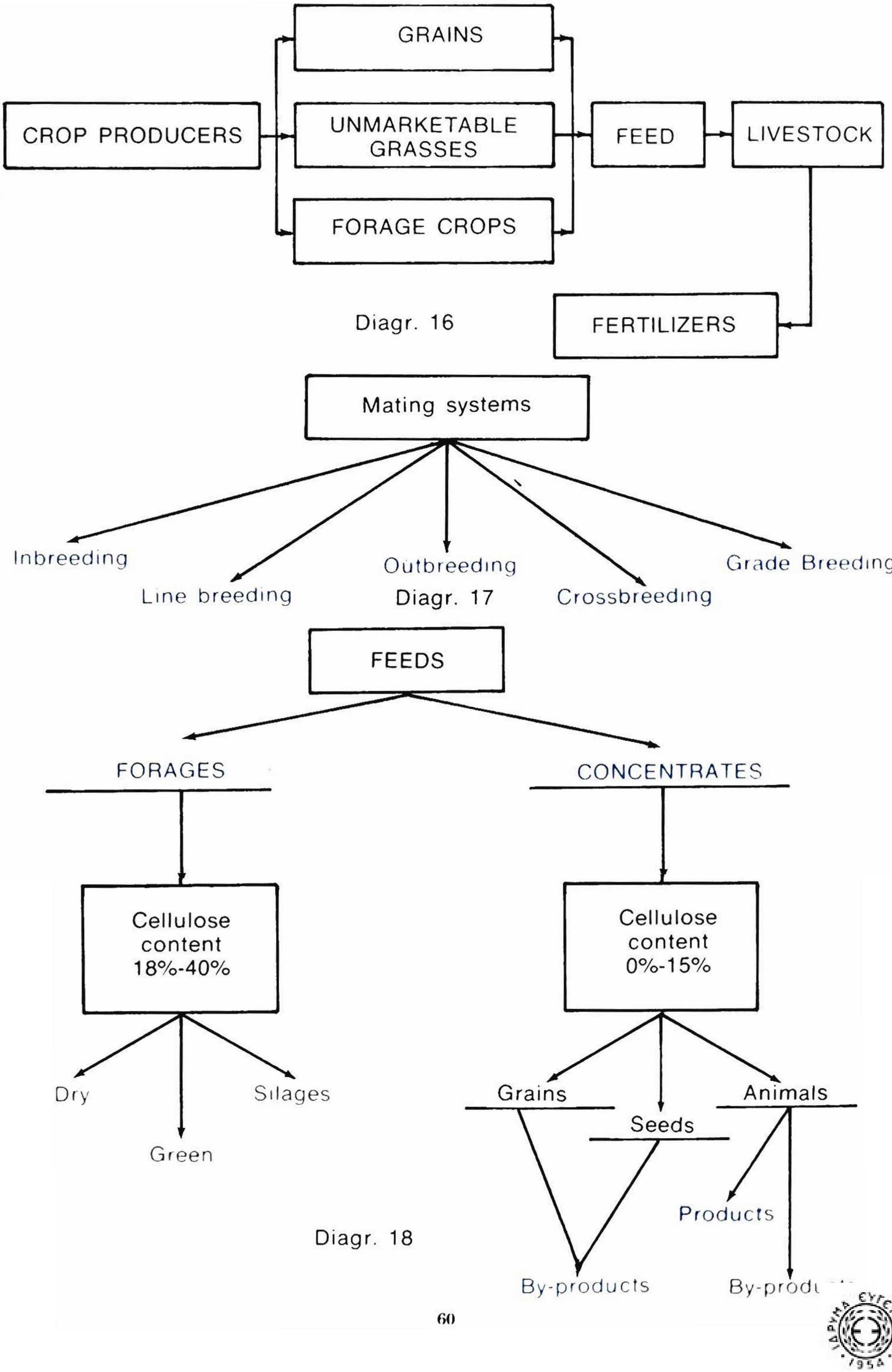
— 1. temperature
— 2. insects
— 3. viruses
— 4. bacteria
— 5. drought
— 6. plants
— 7. poor aeration
— 8. fungi
— 9. frost
— 10. nematode worms
— 11. insufficient oxygen
— 12. mites
— 13. excess of water

LIVESTOCK

9.1a Look at the following diagrams and study the statements that follow them:



Diagr. 15



Diagr. 16

Diagr. 17

Diagr. 18

9.1b **These statements refer to the previous drawings:**

a. There are five mating systems.
Inbreeding is the mating of animals with 50% common ancestry. *Line breeding* is the mating of animals with no more than 25%-50% common ancestry.
Outbreeding reduces the percentage of common ancestry to less than 25% and *crossbreeding* is the mating of animals of different breeds. *Grade breeding* is the mating of purebred sires with grade females.
b. *Forages* are high in cellulose content and *concentrates* are low in cellulose content.
c. *Dry* forages include hay, straw, and fodder.
d. *Green* forages include the above and also root crops.
e. *Silages* include all the above forages.
f. *Concentrates* include grains, seeds and their by-products. They also include animal products and by-products.
g. *Animal husbandry* is a branch of agriculture and deals with the
i. production
ii. breeding
iii. care, and
iv. selection
of livestock.
h. Animal husbandry depends on other agricultural industries, as well:
i. *Crop producers* work very much with the livestock industry.
ii. From the feed a great proportion returns to the soil in the form of *fertilizing elements.*
iii. Livestock industries can *utilize* large tracts of *waste or untillable land.*
iv. *Pasture and crop lands* are kept in *profitable production* for a lot of years.

9.1c **For each of the definitions in the list give the appropriate term:**

i. 50% common ancestry
ii. 25% common ancestry
iii. 10% common ancestry
iv. quite different breeds
v. high in cellulose content
vi. hay, straw and fodder
vii. root crops
viii. low in cellulose content
ix. grains, seeds
x. animal products

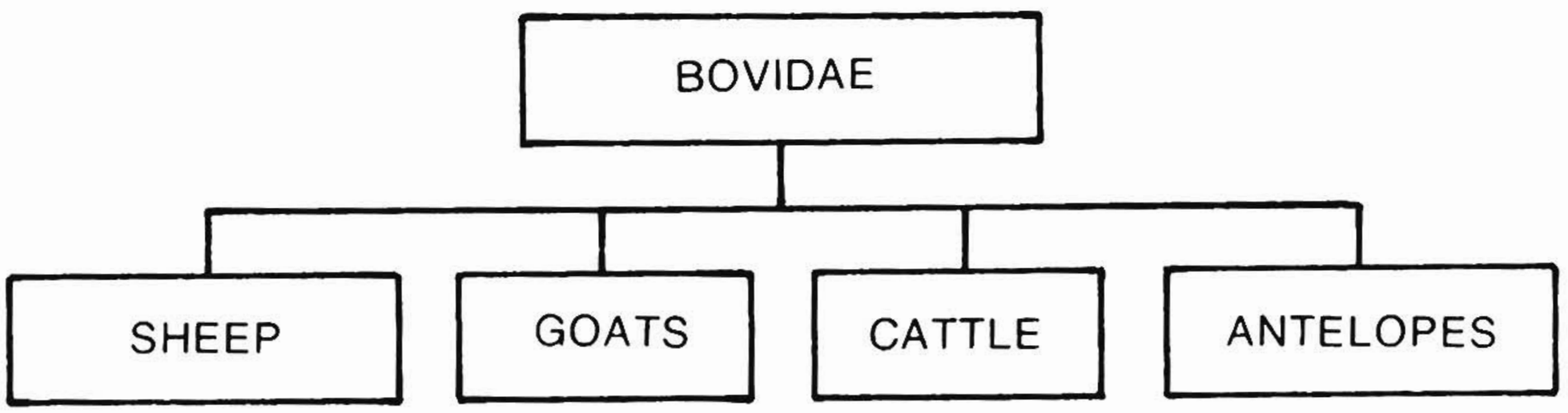
Vocabulary

livestock / 'laɪvstok / ζῶα, κτήνη
husbandry / hʌzbəndrɪ / κτηνοτροφία
production / prə'dʌkʃn / παραγωγή
breeding / 'bridɪŋ / ἀναπαραγωγή
care / keə / φροντίδα
selection/επιλογή
producer / prə'djusə / παραγωγός
unmarketable / ʌn'makɪtəbl / μή ἐμπορεύσιμος
forage / 'forɪdʒ / ζωοτροφή χονδροειδής.

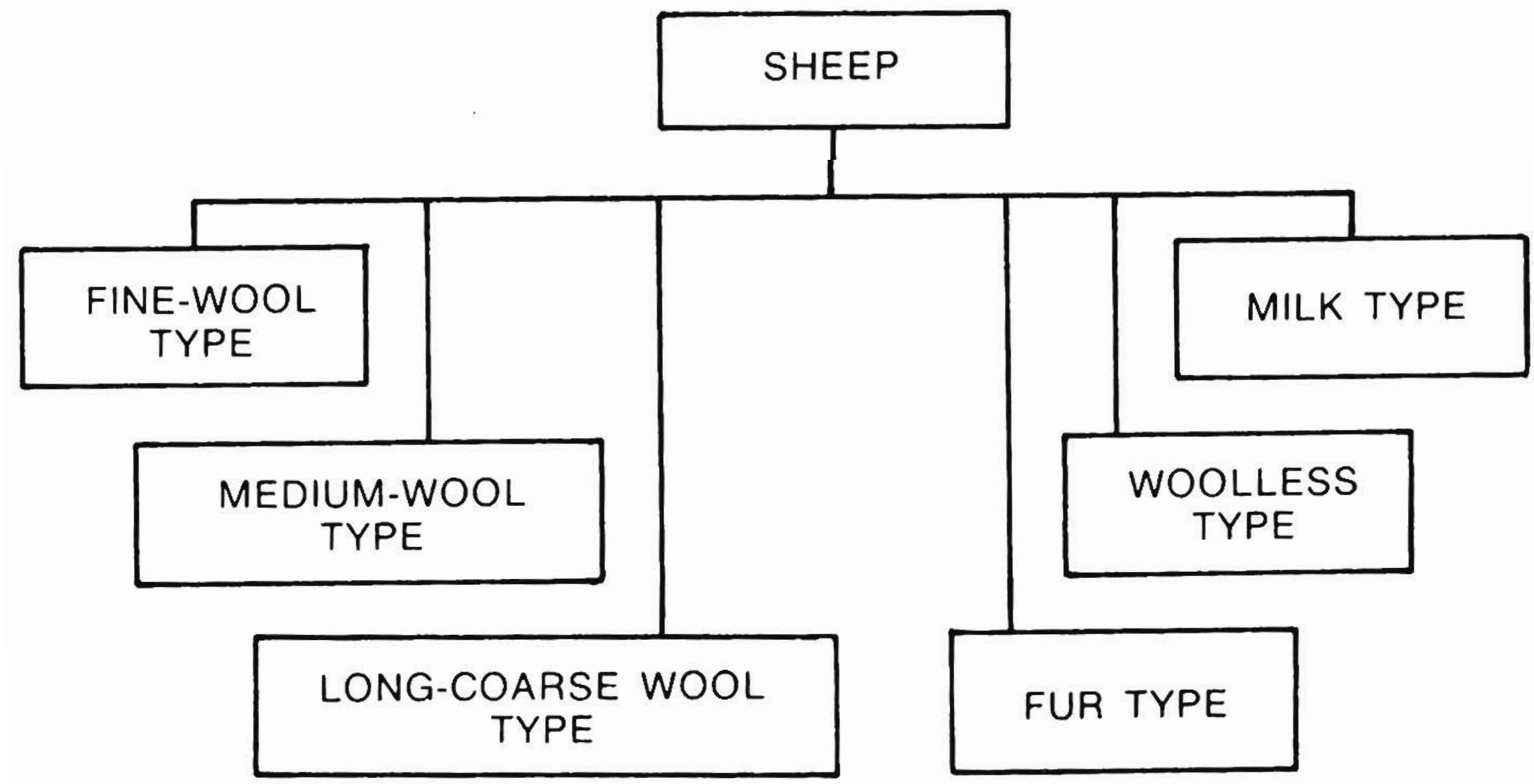
mating / 'meitiŋ / ταίριασμα
inbreeding / 'inbridiŋ / ομομιξία
outbreeding / 'autbridiŋ / ετερομιξία
line breeding / lain 'bridiŋ / διασταύρωση σειράς
crossbreeding / 'kros 'bridiŋ / διασταύρωση
grade breeding / 'greid 'bridiŋ / διασταυρωση μέ βελτιωμένη ποικιλία
concentrate / 'konsntreit / συμπύκνωμα
cellulose / 'seljuləus / κυτταρίνη. σελλουλόζη
content / 'kontent / περιεχόμενο
silage / 'sailidʒ / χορτονομή
by product / 'bai 'prodʌkt / ύποπροϊόν

ancestry / 'ænsistri / γενεαλογία
reduce / ri'djus / μειώνω
purebred / 'pjuəbred / καθαρόαιμο
sire / saiə / γεννήτορας
fodder / 'fodə / ξηρά ζωοτροφή
tract / trækt / μεγάλη έκταση
waste / weist / άκαλλιέργητος /άχρηστος
untillable / ʌn'tiləbl / μή καλλιεργήσιμος
profitable / 'profitəbl / έπικερδής
grade / greid / ποιότητα

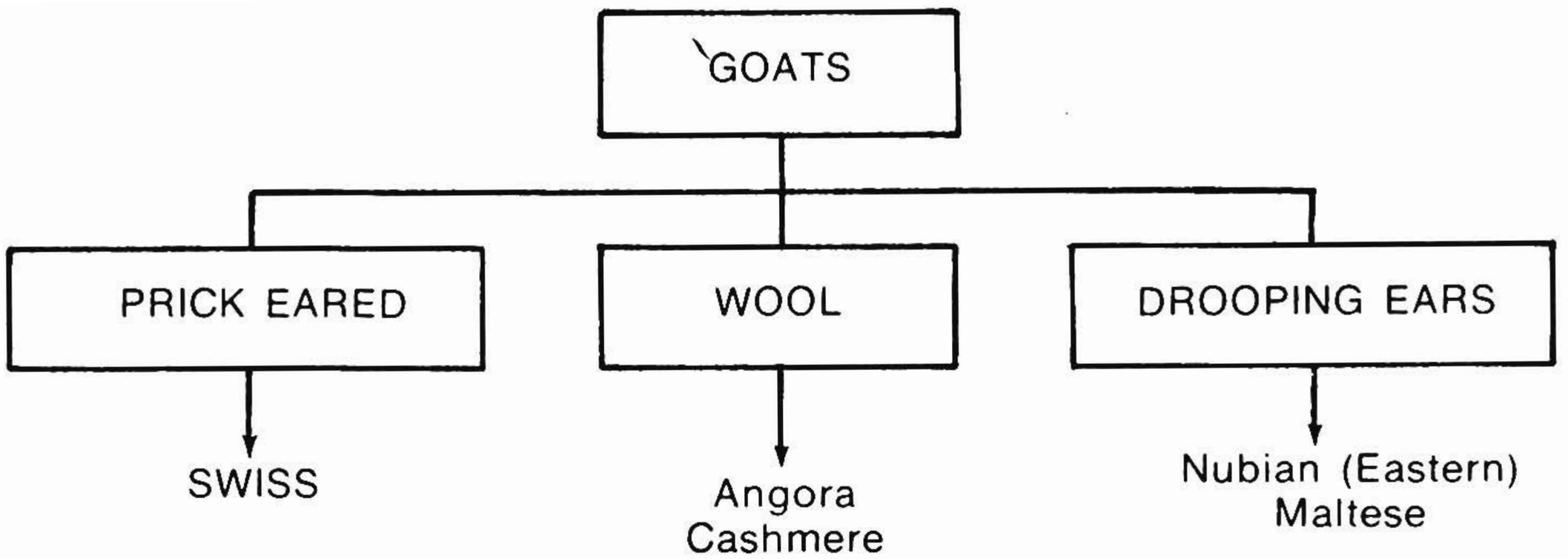
9.2a **Look at the following diagrams:**



diagr. 19



diagr. 20



diagr. 21

9.2b **Study the following statements:**

a. Sheep, goats and cattle belong to the *same family.*
b. Bovidae is the name of *ruminants* with hollow horns.
c. We call the male sheep *rams* and the female sheep *ewes.*
d. The *horns* of the females are smaller than the horns of the males.
e. There are more than 200 *breeds* all over the world but only 30 breeds are important.
f. We group sheep according to:
   i. the *length and thickness of their tail:*
   ii. the *quality* of their wool and
   iii. the *products* they produce.
g. According to the first category we've got:
   i. short-tailed
   ii. long-tailed
   iii. thick-tailed, and
   iv. thin-tailed
h. According to the commodities they produce we distinguish sheep to the *wool type, milk type* and *dual purpose:*
i. According to the wool we've got the type:
   i. fine-wool
   ii. medium-wool
   iii. long-coarse wool
   iv. fur, and
   v. woolless.
j. Some characteristic types of the third category are:
   i. The *Merino* in the range of fine wool sheep. The colour of their faces and legs is white (fig. 29 and 30).
   ii. The *Ile de France* is a medium-wool type. It is a white-face, hornless sheep. It is an excellent producer of meat and wool. Another type of medium-wool is the *Suffolk.* It is also hornless but its face is dark (fig. 31 and 32)
   iii. The *Border Leicester* is a long-coarse wool type. It is hornless and has got white face (fig. 33)
   iv. The *Karakul* is a fur sheep
   v. The *Blackhead Persian* is a woolless type.
k. Some types of milk sheep are:
   i. La Razza Sarda from Sardinia
   ii. The Pelvin from Bulgaria.
   iii. Chios.
   iv. Karagouniko

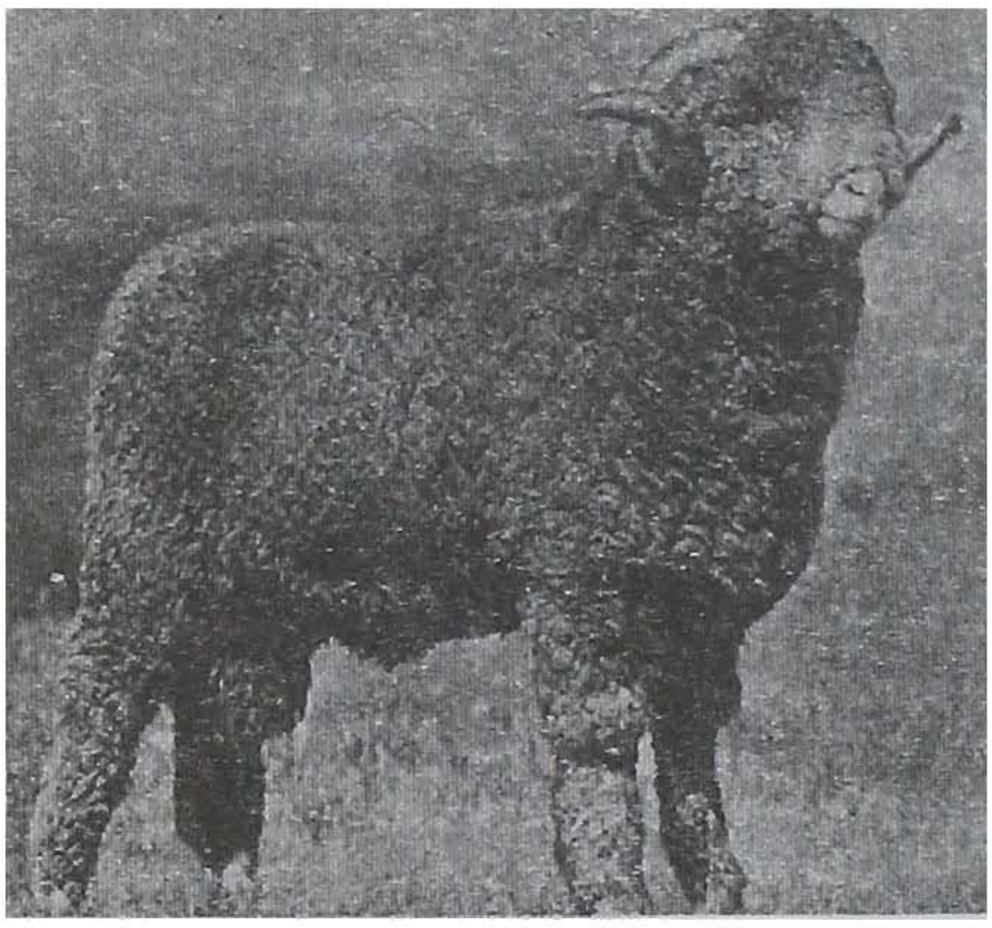


fig. 29 MERINO RAM

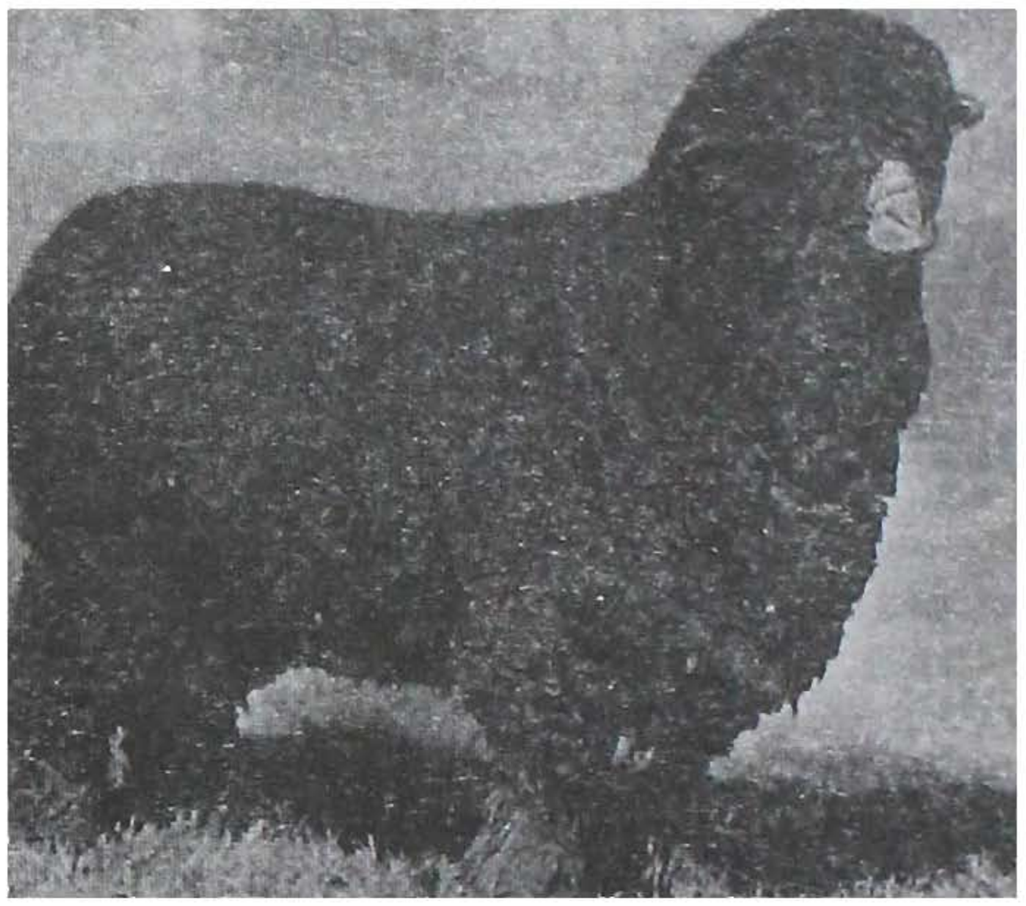


fig. 30 MERINO EWE

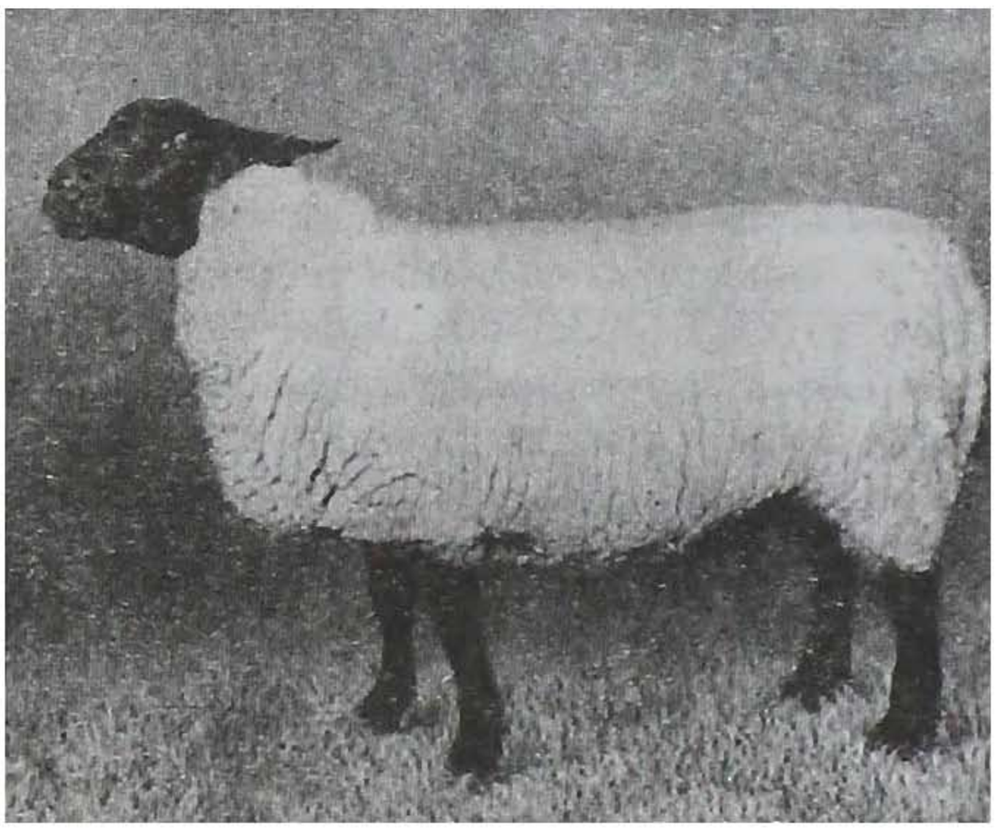
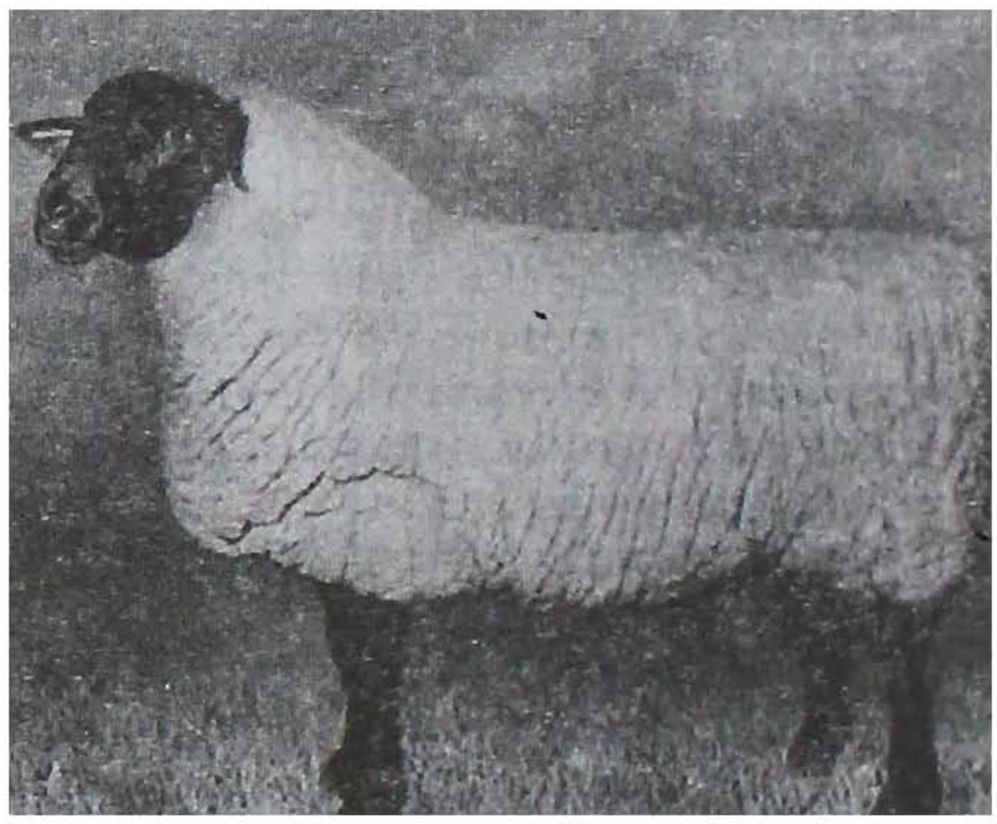
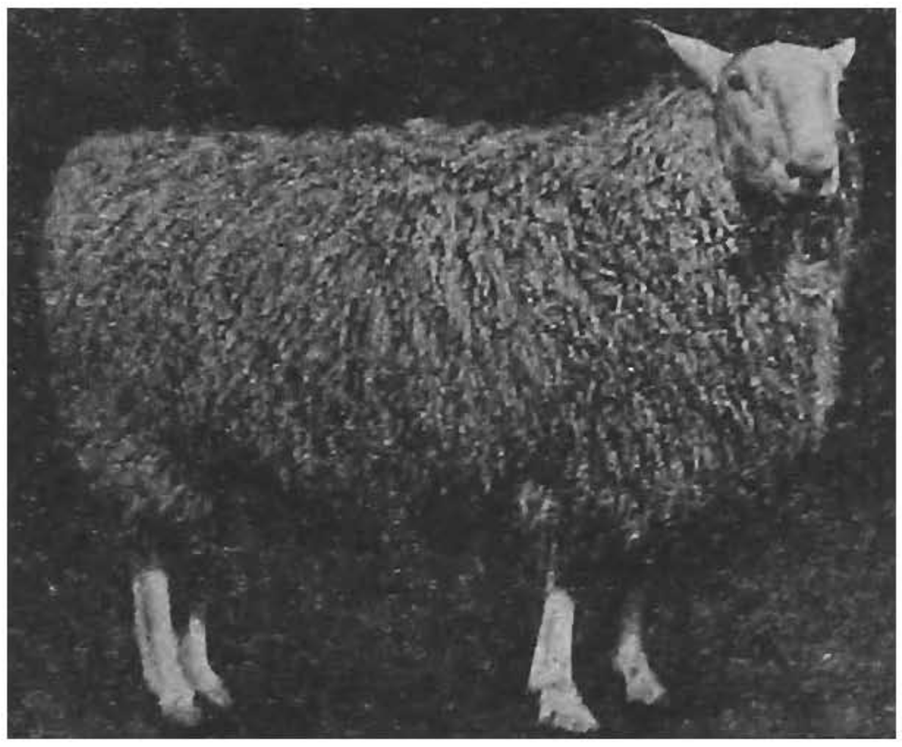


fig. 31



SUFFOLK RAM

fig. 32



HORDER LEICESTER EWE

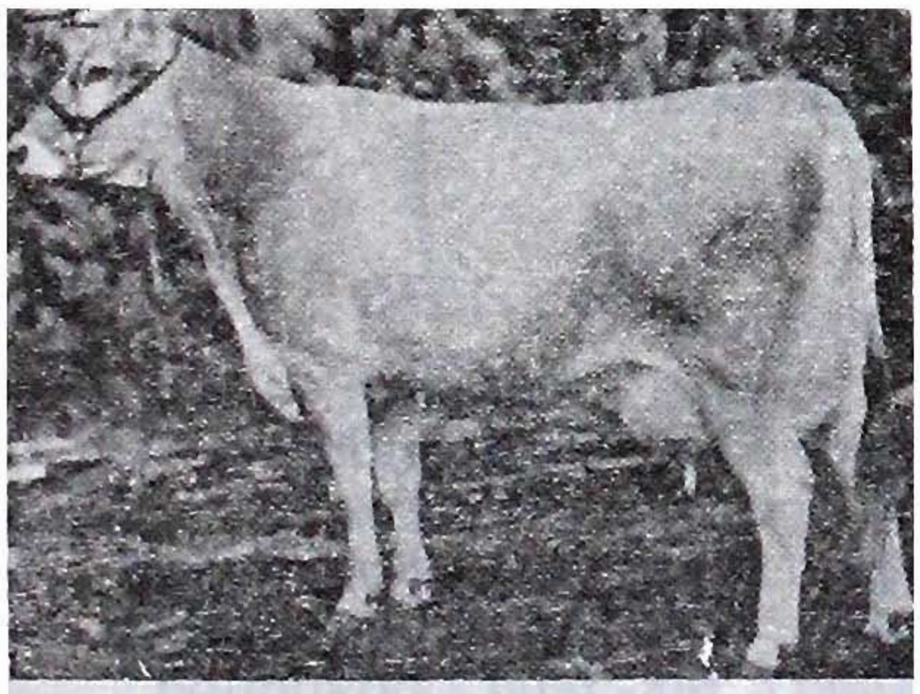
fig. 33

Types of beef breeds

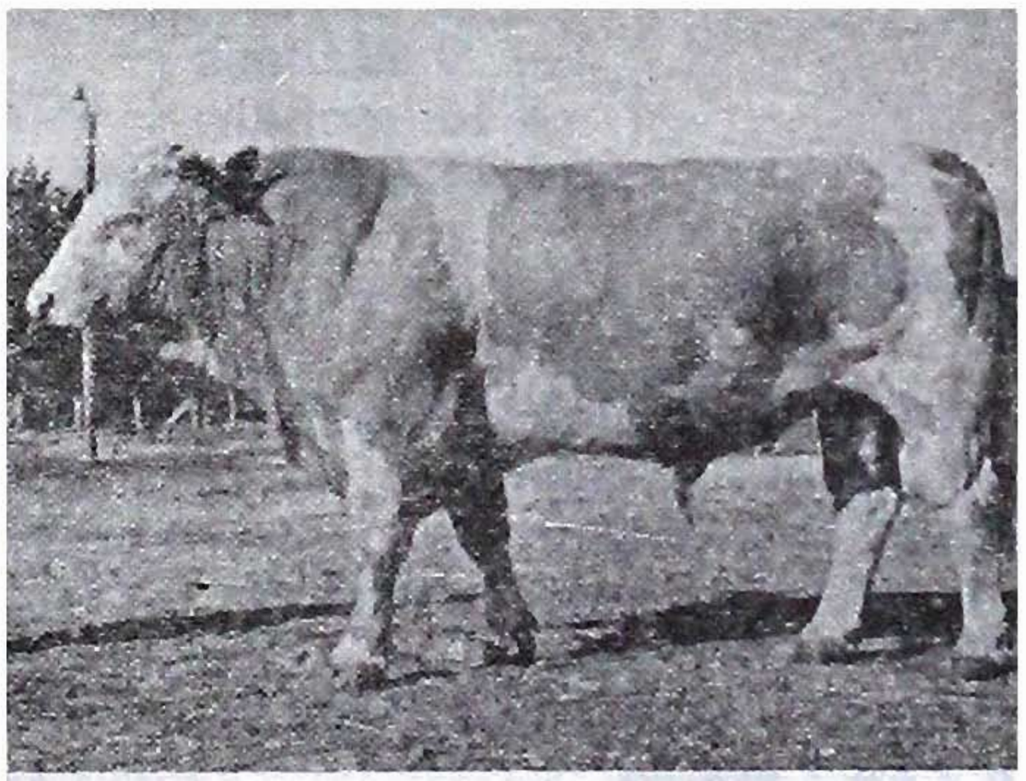
Hereford cow

Holstein bull

Types of dairy breeds

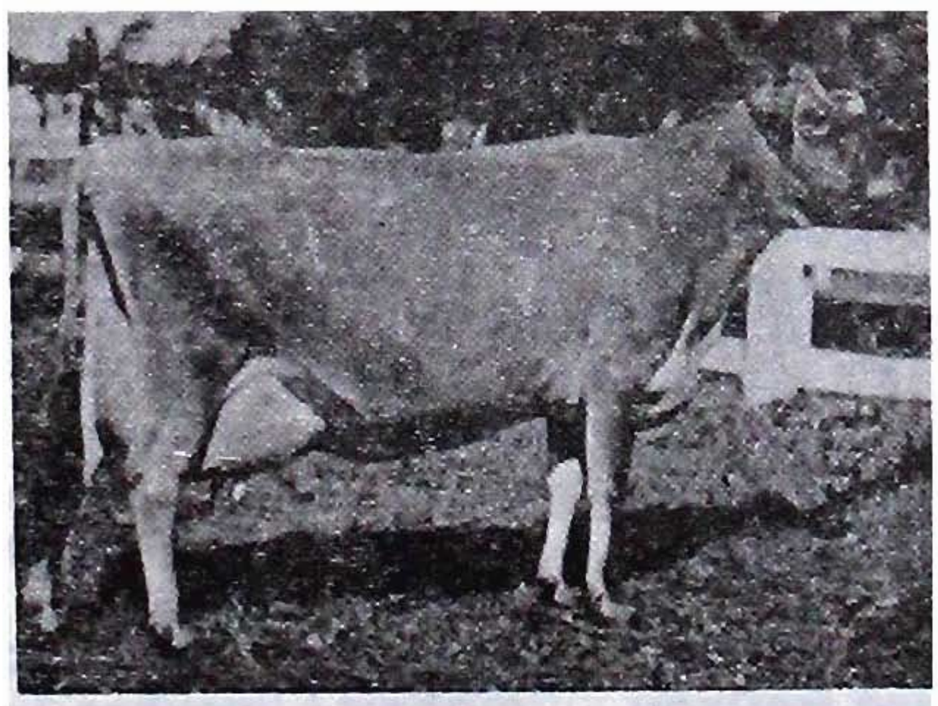


Brown Swiss cow



Simmental bull

Types of dual purpose breeds



Jersey cow

l. The many breeds of goats fall into three main groups: The *prick-eared*, the *Eastern* or *Nubian* with long drooping ears and the *wool* goat.
m. The domestic goat is primarily a *milk producer*.
n. The *Swiss* goat is an example of the prick-eared type.
o. The *Maltese* goat is an important source of milk.
p. The *Angora* and *Cashmere* goats belong to the wool type and produce mohair.
q. Nubians are large, short-haired goats.

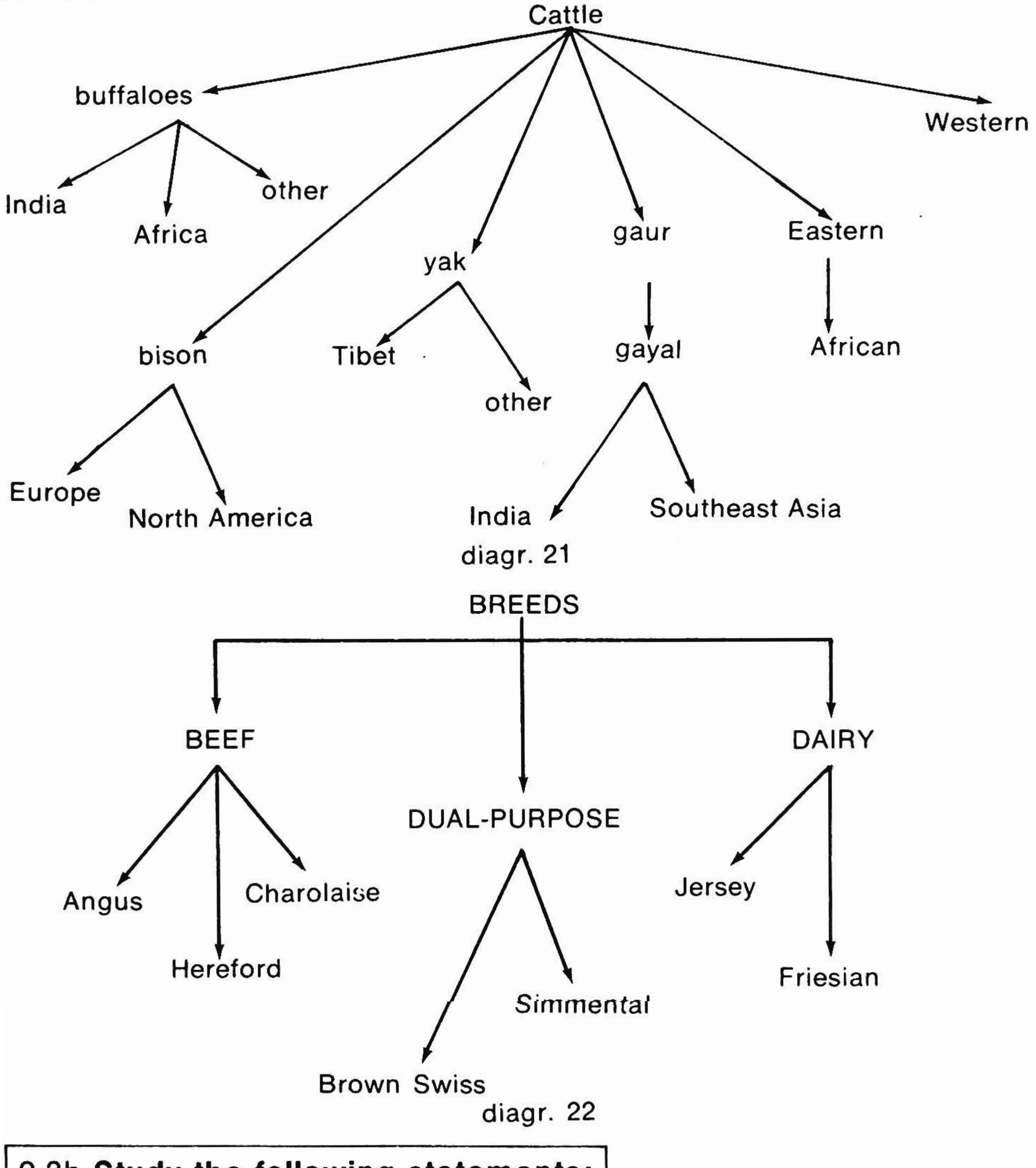
9.2c **Look at the following terms and say whether they refer to sheep (S) or goats (G) or both (B).**

— 1. horn
— 2. wool type
— 3. woolless
— 4. ruminant
— 5. Swiss
— 6. fur type
— 7. hornless
— 8. prick-eared
— 9. Maltese
— 10. mohair
— 11. milk
— 12. ewe
— 13. breed
— 14. Angora
— 15. short tailed
— 16. ram
— 17. Merino
— 18. Pelvin
— 19. Karakul
— 20. Nubian
— 21. wool
— 22. Cashmere

Vocabulary

bovidae / 'bəʊvaɪdæ / βοοειδής
goat / gəʊt / κατσίκα
cattle / kætl / βόδια
antelope / 'æntɪləʊp / άντιλόπη
coarse / kɔs / τραχύς
woolless / 'wʊlɪs / χωρίς μαλλί
fur / fɜr / γούνα
pricked / prɪkt / σουβλερός
drooping / 'drupɪŋ / κρεμαστός
ruminant / 'rumɪnənt / μηρυκαστικός
hollow / 'holəʊ / κούφιος
horn / hɔn / κέρατο
ram / ræm / κριάρι
ewe / ju / προβατίνα
breed / brid / έκτρέφω, φυλή
Karakul / 'kærəkul / Καρακούλ
Blackhead Persian / 'blækhæd 'pɜʃn / Περσικό Μπλάκχεντ (μαυροκέφαλο)
Sardinia / sɑ'dɪnɪə / Σαρδινία
Pelvin / 'pelvn /
Bulgaria / bul'gærɪə / Βουλγαρία
Eastern / istən / ανατολικός
Nubian / 'nʌbɪən /
domestic / də'mestɪk / κατοικίδιος
primarily / 'praɪmrɪlɪ / κατά πρώτον
Swiss / swɪs / Ελβετικός
tail / teɪl / ούρά
quality / 'kwolətɪ / ποιότητα
commodity / kə'modətɪ / προϊόν
produce / prə'djus / παράγω
short-tailed / 'ʃɔt 'teɪld / βραχύουρα
long-tailed / 'loŋ - 'teɪld / μακρόουρα
thick-tailed / 'θɪk-'teɪld / παχύουρα
thin-tailed / 'θɪn-'teɪld / λεπτόουρα
dual purpose /διπλής παραγωγικής κατευθύνσεως
Merino / mə'rinəʊ / Μερινός
Ile de France / 'ɪl də fræns / "Ιλ ντέ Φράνς
hornless / 'hɔnlɪs / χωρίς κέρατο
producer / prə'djusə / παραγωγός
Suffolk / 'sʌfolk / Σάφφολκ
Border Leicester / 'bɔdə 'lestə /
Maltese / məl'tiz / Μαλτέζικος
Angora / æŋ'gɔrə /
Cashmere / kæʃ'mɪə /
mohair / 'məʊheə / μοχαίρ
short-haired / 'ʃɔt 'heəd / μέ κοντή τρίχα

9.3a **Look at the following diagrams:**



diagr. 21

diagr. 22

9.3b **Study the following statements:**

a. We usually divide cattle into six groups *buffaloes* (breeding in India, Africa and other *bison* (breeding in Europe and North America, the *yak* (breeding in Tibet and other), the *gaur, gayal* (breeding in India and Southeast Asia) and the *Eastern* (and African) and *Western* (or European) cattle.

b. According to the products they produce we distinguish cattle to:
   i. beef breeds
   ii. dairy breeds
   iii. dual-purpose breeds

c. Some characteristic types of beef breeds are:
   i. Angus
   ii. Hereford
   iii. Charolaise
d. Some characteristic types of dairy breeds are:

   i. Jersey
   ii. Friesian

e. Some characteristic types of dual purpose breeds are:
   i. Brown Swiss
   ii. Simmental
f. The colour of the *Angus* type is *black*, that of the *Hereford* type *red* with white faces and that of the *Charolaise* breed *yellowish-white.*
g. The colour of the *Jersey* breed is a shade of *fawn or cream*, whereas the *Friesian* type is *spotted black and white.*
h. The colour of the *Brown Swiss* ranges from *light brown to dark brown* or gray. The colour of the *Simmental* is *red.*
i. According to the age and sex of the cattle we use the following terms:
 i. males — Starting from *bull-calf* he becomes a *bull (intact)* (*castrated*) he becomes a *steer* and then after 2-3 years he grows to an *ox.*
ii. females — First, she is a *heifer-calf* then grows into a *heifer* and finally becomes a *cow.*

9.3c **Complete the following table:**

Breed	live weight in kilos	Colour	Type
Angus	400-500		
Hereford	500-600		
Charolaise	600-700		
Jersey	350-400		
Friesian	600-750		
Brown Swiss	500		
Simmental	650-700		

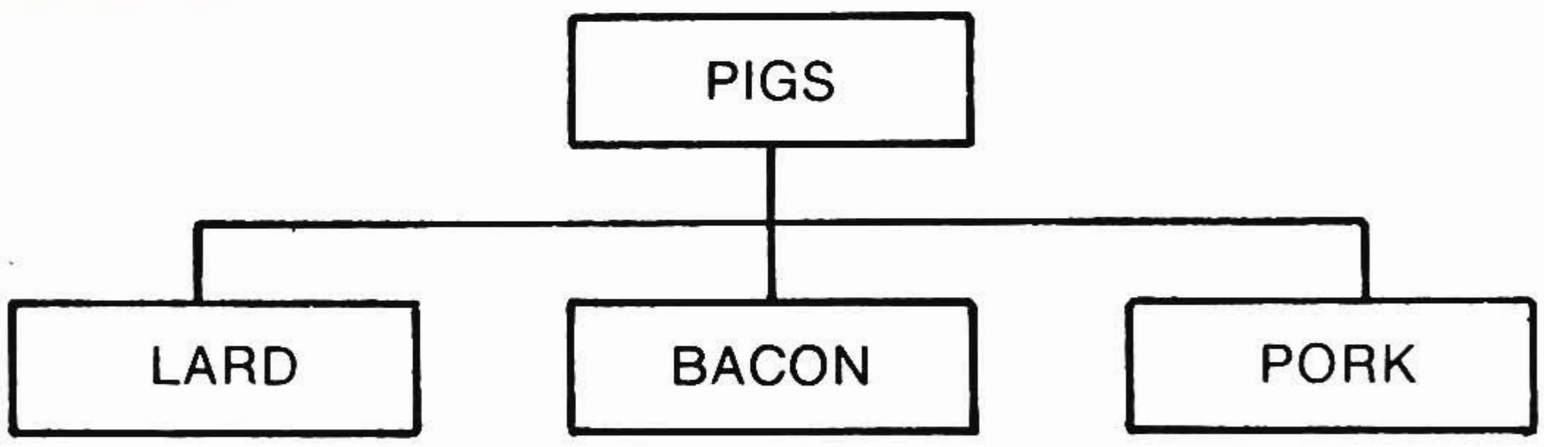
Table 4

Vocabulary

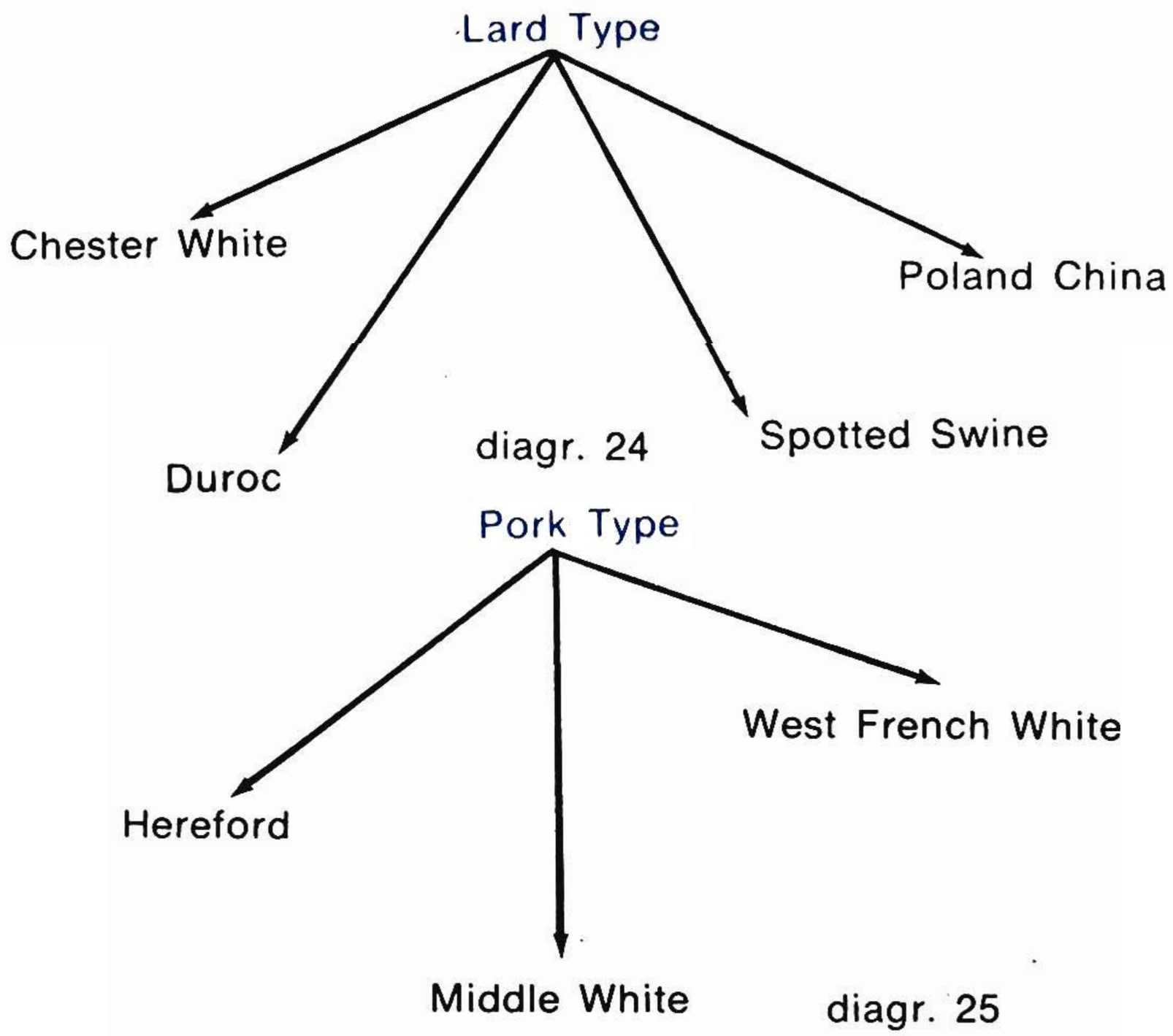
buffalo / 'bʌfləʊ / βούβαλος
bison / baɪsn / βούβαλος (βόνασος)
yak / jæk / βόδι τοῦ Θιβέτ
Tibet / tɪ'bet / Θιβέτ
beef / bif / βωδινό
dairy / 'deərɪ / γαλακτοπαραγωγικός
dual purpose / djul 'pɜpəs / μικτός τύπος
Angus / 'æŋgəs / "Αγκους
Hereford / 'hɜfɔd / Χέρφορντ

Charolaise / 'ʃarəʊle / Σαρολέ
Simental / 'sɪməntl / Σιμεντάλ
Jersey / 'dʒɜzɪ / Ζέρσεϋ
Friesian / 'frizɪən /
Holstein / 'holstaɪn /
shade / ʃeɪd / ἀπόχρωση
fawn / fɔn / καστανοκίτρινος
spotted / 'spotɪd / μέ κηλίδες
bull-calf / 'bʊl 'kaf / μοσχάρι αρσενικό
bull / 'bʊl / ταῦρος
intact / 'ɪn'tækt / ἄθικτος
castrated / kæ'streɪtɪd / εὐνουχισμένος
steer / stɪə / μοσχάρι
ox / oks / βόδι
heifer-calf / 'haɪfə / δαμάλι
cow / kaʊ / ἀγελάδα
live (adj) / laɪv / ζωντανός

9.4a **Study the following diagrams:**

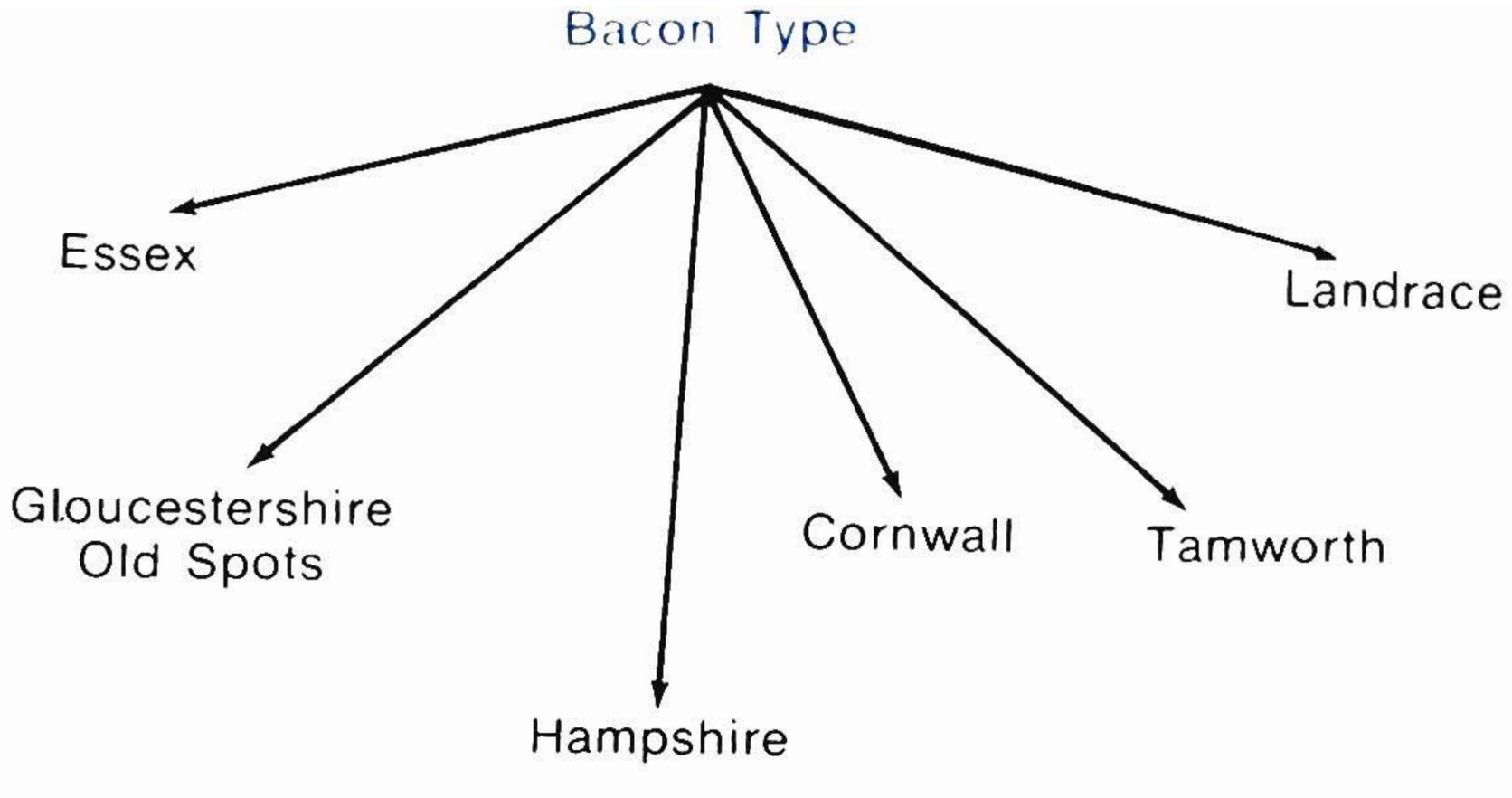


dragr. 23



diagr. 24

diagr. 25



diagr. 26

9.4b Consider the following statements:

a. We can classify pigs as *lard*, *bacon*, or *pork*.
b. Lard pigs are *large*, bacon pigs are *smaller* and pork pigs may be even smaller.
c. The *Chester White* is white with a pink skin. The *Duroc* pig is red. The *Poland China* is black with white face and feet and a white tip on the tail. The *Spotted Swine* is like the Poland China but has more white spots over the body.
d. The *Essex* pig is black with a white saddle on the shoulder and forelegs, and with white on the nose, hind legs, and tip of the tail. The *Gloucestershire* is white with black spots. The *Cornwall* is all-black. The *Tamworth* is golden red. The *Landrace* is white.
e. The *Hereford* pig is red with white head. It is similar to the Hereford cattle.
f. The raising of pigs requires:
   i. houses to provide protection
   ii. dry bedding
   iii. prevention of dust.
g. Good health, rapid growth, profitable production are very important and require sanitation.

9.4c ***Complete the following table:***

No	Breed	colour	type
1.	Chester White		
2.	Spotted Swine		
3.	Gloucestershire		
4.	Hereford		
5.	Duroc		
6.	Essex		
7.	Tamworth		
8.	Landrace		
9.	Cornwall		
10.	Poland China		

Vocabulary

lard / lɑd / χοιρινό λίπος
swine / swɑɪn / χοῖρος
bacon / beɪkn / μπέικον
pork / pɔk / χοιρινό κρέας
Chester / 'tʃestə /
Durok / 'dʌrok /
Polland / 'pəʊlænd /
China / 'tʃɑɪnə /
Essex / 'eseks /
Gloucestershire / 'glɔstəʃɑɪr /
Gornwall / 'kɔnwɔl /
Tamworth / 'tæmwɜθ /
Landrace
Hampshire / 'hæmʃɑɪə /
pink / pɪnk / ροδόχρους
tip / tɪp / ἄκρο
saddle / sædl / σέλα
shoulder / 'ʃəʊldə / ὦμος
foreleg / 'fɔleg / μπροστινό πόδι
hind / hɑɪnd / ὀπίσθιος
similar / 'sɪmlə / ὅμοιος
raising / 'reɪzɪŋ / εκτροφή
provide / prə'vɑɪd / παρέχω
protection / prə'tekʃn/προφύλαξη
prevention / prɪ'venʃn / παρεμπόδιση
dust / dʌst / σκόνη
rapid / 'ræpɪd / γρήγορος
profitable / 'profɪtəbl / ἐπικερδής
sanitation / 'sænɪ'teɪʃn / ὑγιεινή

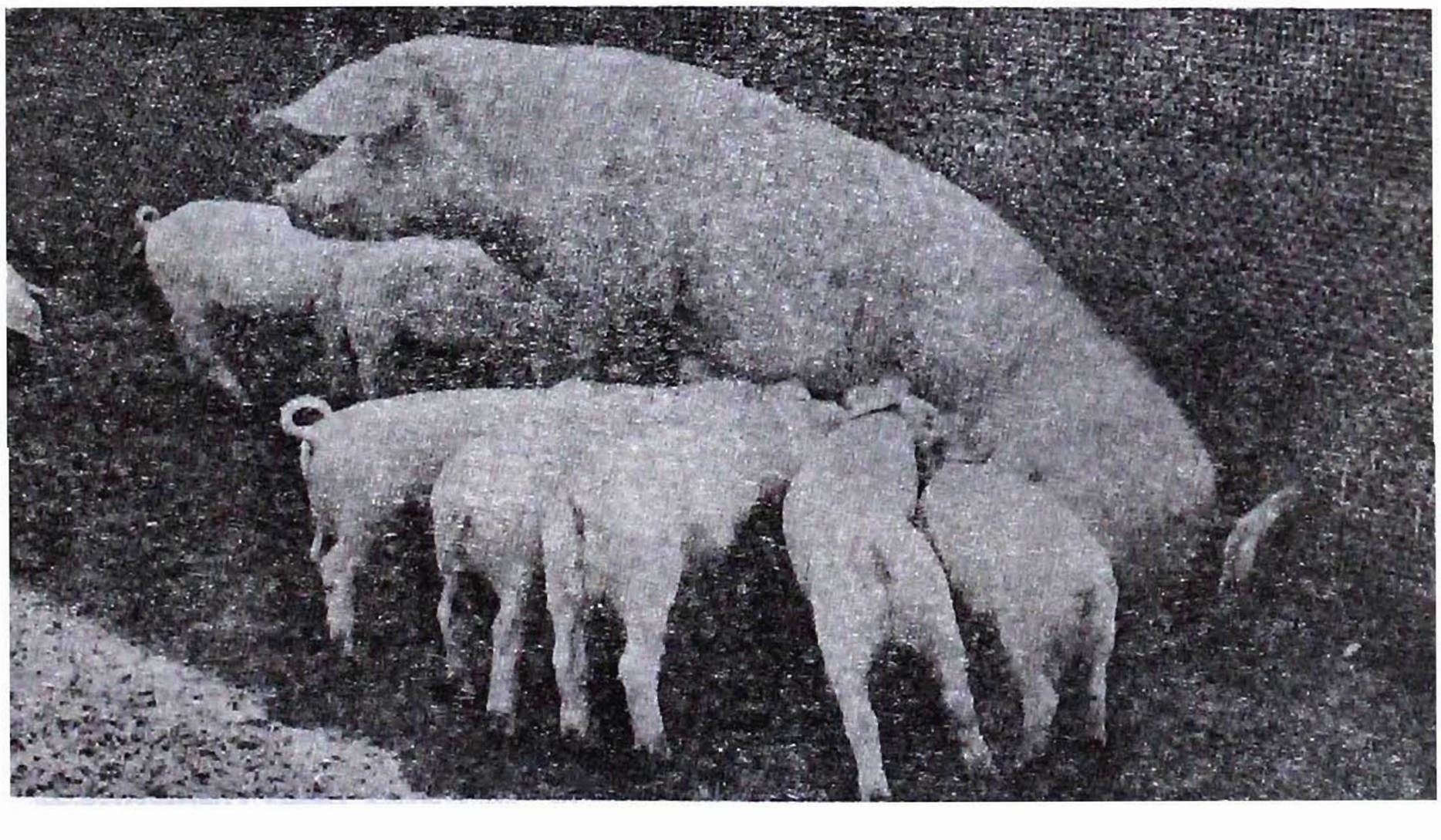
EXERCISES

I. Which is correct in the following a,b or c?

1. The content of cellulose in forages is - - - - - - - -
   a. 2%
   b. 15%
   c. 30%
2. The mating systems are - - - - - - - -
   a. 5
   b. 3
   c. 6
3. Inbreeding denotes - - - - - - - - common ancestry.
   a. no
   b. 50%
   c. 25%
4. Line breeding denotes - - - - - - - - common ancestry.
   a. no
   b. 50%
   c. 25%

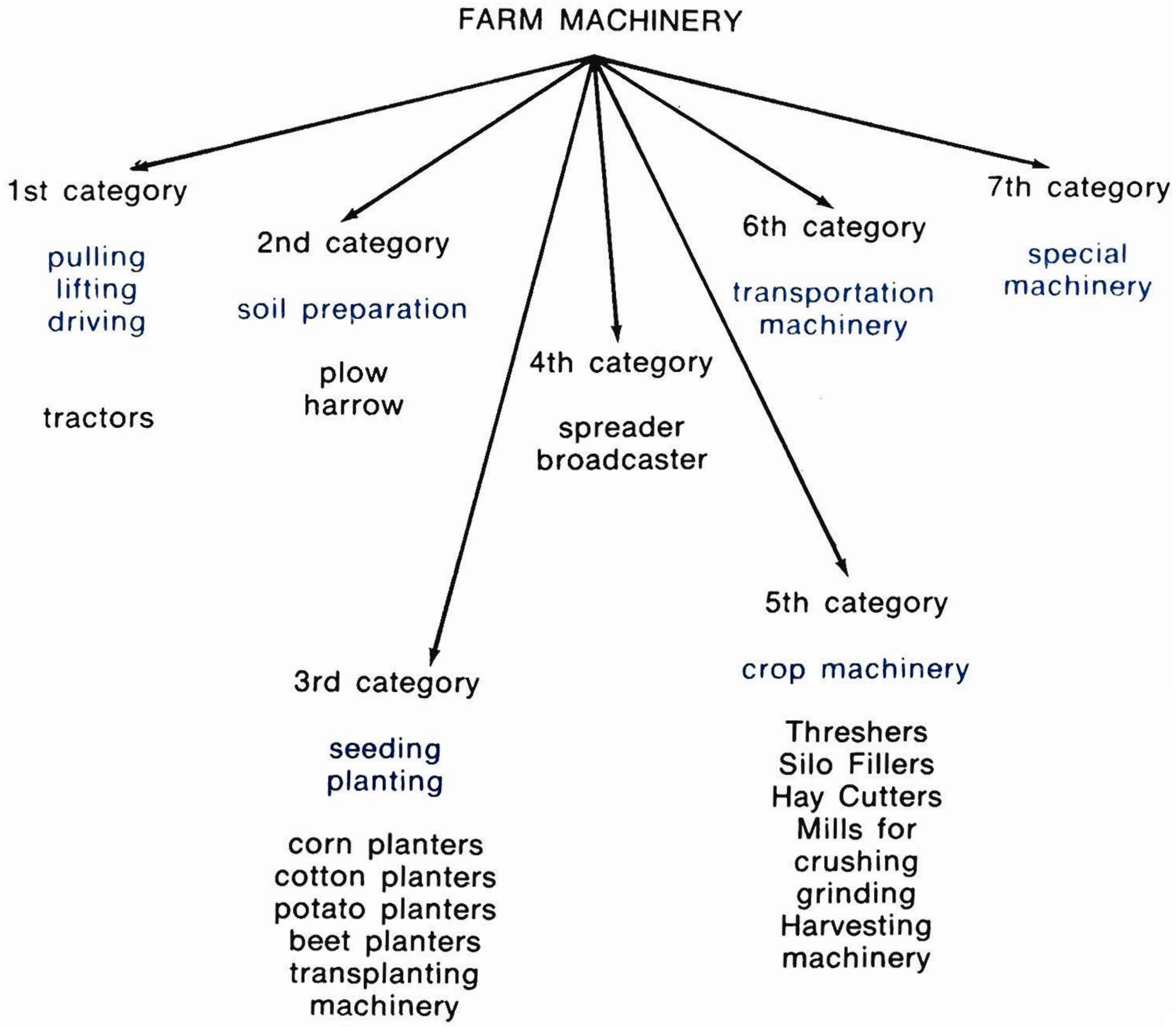
5. Outbreeding denotes - - - - - - - - common ancestry.
    a. no
    b. less than 25%
    c. more than 25%
6. Crossbreeding denotes - - - - - - common ancestry.
    a. no
    b. less than 25%
    c. more than 25%
7. Bovidae include - - - - - -
    a. sheep and goats.
    b. cattle and antelopes.
    c. both "a" and "b".
8. The Angora is a - - - - - - - - goat.
    a. wool
    b. prick eared
    c. drooping ear
9. The Maltese is a - - - - - - - - goat.
    a. wool
    b. prick eared
    c. drooping ear.
10. The Swiss is a - - - - - - - - goat.
    a. prick eared
    b. wool
    c. drooping ear
11. The Merino belongs to the - - - - - - - - type.
    a. medium wool
    b. fine wool
    c. fur
12. The Ile de France belongs to the - - - - - - - - type.
    a. medium wool
    b. fine wool
    c. long-coarse wool
13. The Border Leicester belongs to the - - - - - - - - type.
    a. medium wool
    b. fine wool
    c. long-coarse wool
14. The Swiss goat belongs to the - - - - - - - - type.
    a. wool
    b. prick eared
    c. drooping ears
15. The Maltese goat belongs to the - - - - - - - - type.
    a. wool
    b. prick eared
    c. drooping ears
16. The Cashmere goat belongs to the - - - - - - - - type.
    a. wool
    b. prick eared
    c. drooping ears
17. The Angus type is a - - - - - - - -
    a. dairy breed.
    b. dual purpose breed.
    c. beef breed.

18. The Simmental type is a - - - - - - - -
    a. dairy breed.
    b. dual purpose breed.
    ''c. beaf breed.
19. The Jersey type is a - - - - - - - -
    a. dairy breed.
    b. dual purpose breed.
    c. beef breed.
20. The colour of the Brown Swiss is - - - - - - - -
    a. gray.
    b. red.
    c. cream.
21. The Duroc pig belongs to the - - - - - - - - type.
    a. bacon
    b. pork
    c. lard
22. The Cornwall pig belongs to the - - - - - - - - type.
    a. bacon
    b. pork
    c. lard
23. The Hereford pig belongs to the - - - - - - - - type.
    a. bacon
    b. pork
    c. lard



MACHINES ON THE FARM

10.1a Look at the following diagram:



diagr. 27

10.1b Study the following statements:

a. *Farm machinery* includes power machine tractors and field machines.
b. Hundreds of years ago the fields were *full of people and animals* at seeding planting or harvest time.
c. Nowadays the work is done *easier, quicker and better.*
d. All over the world different machines do *particular jobs.*
e. We can divide the farm machinery to six categories. In the first category we've got machinery for *pulling, lighting* or driving things. The *tractor* is such an important machine (fig. 34).
f. The powerful engine of a tractor can easily pull a heavy *trailer* (fig. 35).

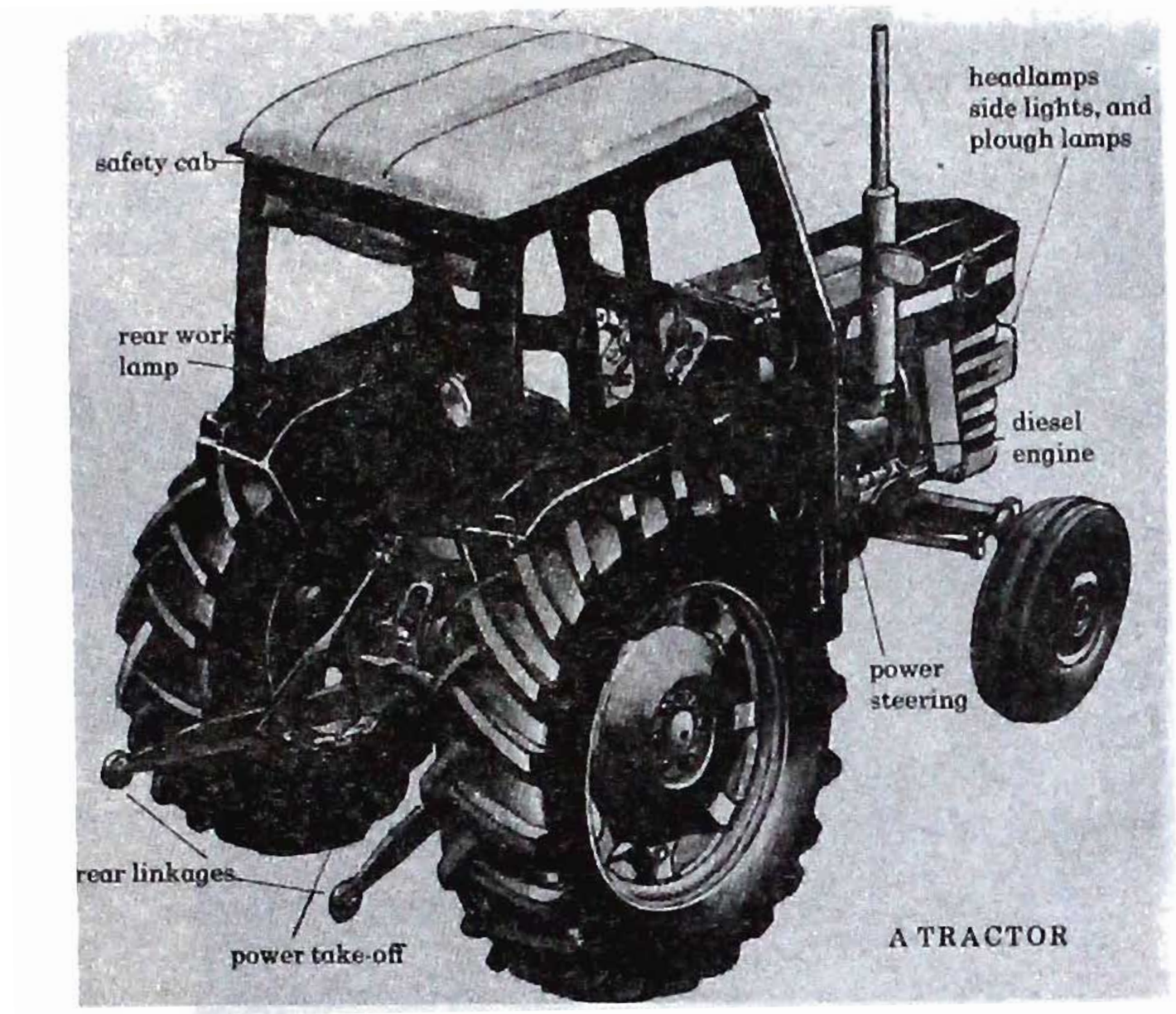


Fig. 34

Fig. 35

g. We can also fit a *loader* to the tractor (fig. 36), as well as a *hedge trimmer*. The tractor lifts the hedge-trimmer to its right position and provides the power to drive the saw.
h. The *plow* and the *harrow* (fig. 37) are very important in the preparation of the soil before the sowing of the seeds.
i. In the third category we've got *seeding and planting machinery*. The planters make furrows in the earth and drop the seeds into it. Then, by means of discs they pile up the earth over the rows (fig. 38). The *seeders* (fig. 39) on the other hand are used for small seeds and rollers at the back press the earth over them.
j. There are many types of planters for corn, cotton, potato etc. There is also another kind of machinery, the *transplanting* machinery.

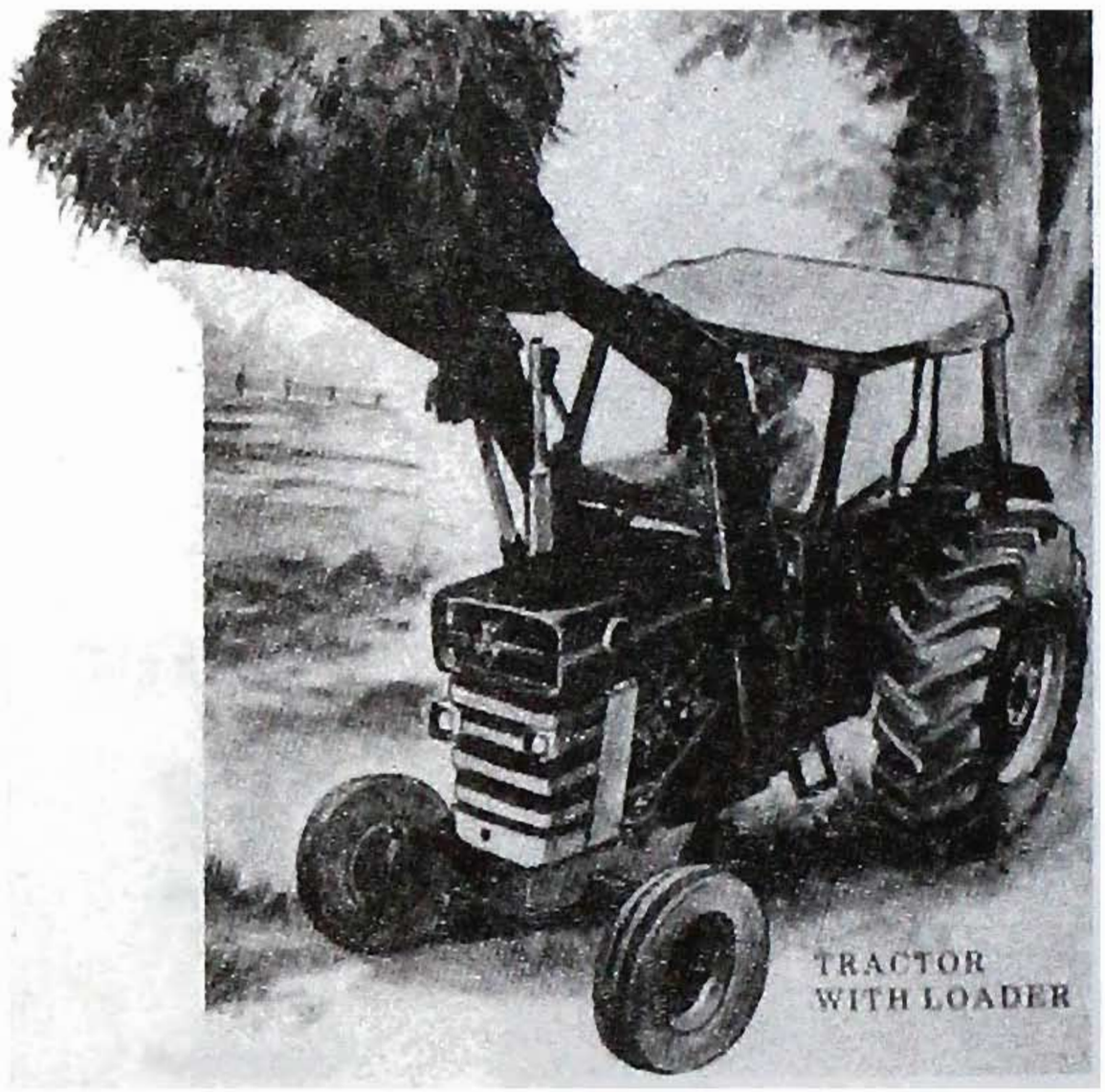


Fig. 36

Fig. 37

Fig. 38

Fig. 39

k. The growth of the crops requires both *manure* and chemical *fertilizers*. We use *spreaders* (fig. 40) to toss the manure over the fields and *broadcasters* (fig. 41) to spread the fertilizer grains over the fields.
l. We also use *sprayers* (fig. 42) to spray chemicals onto the ground in order to control weeds and insects and *mistblowers* to spray fruit trees and other tall crops.
m. When harvest comes we use special machinery, such as, *threshers, hay cutters, silo fillers* etc. We also use mills for *crushing* and *grinding* the crops.
n. The sixth category consists of the *transportation* machinery for the various jobs in the farm, and finally the seventh category includes special machinery such as *feeding hoppers, milking machine etc.*

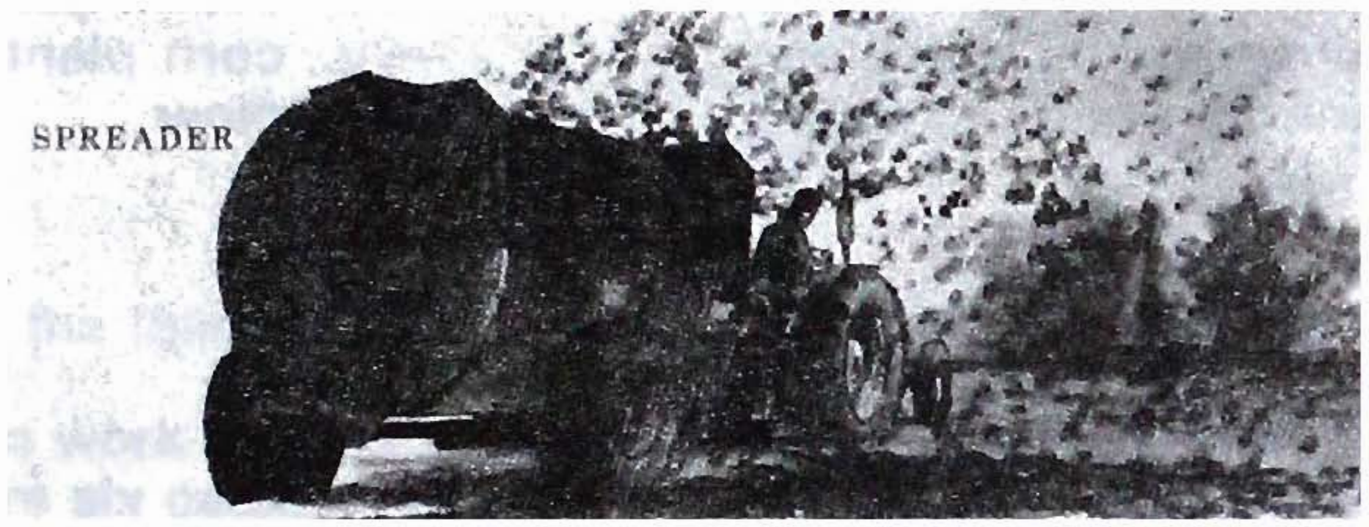


Fig. 40

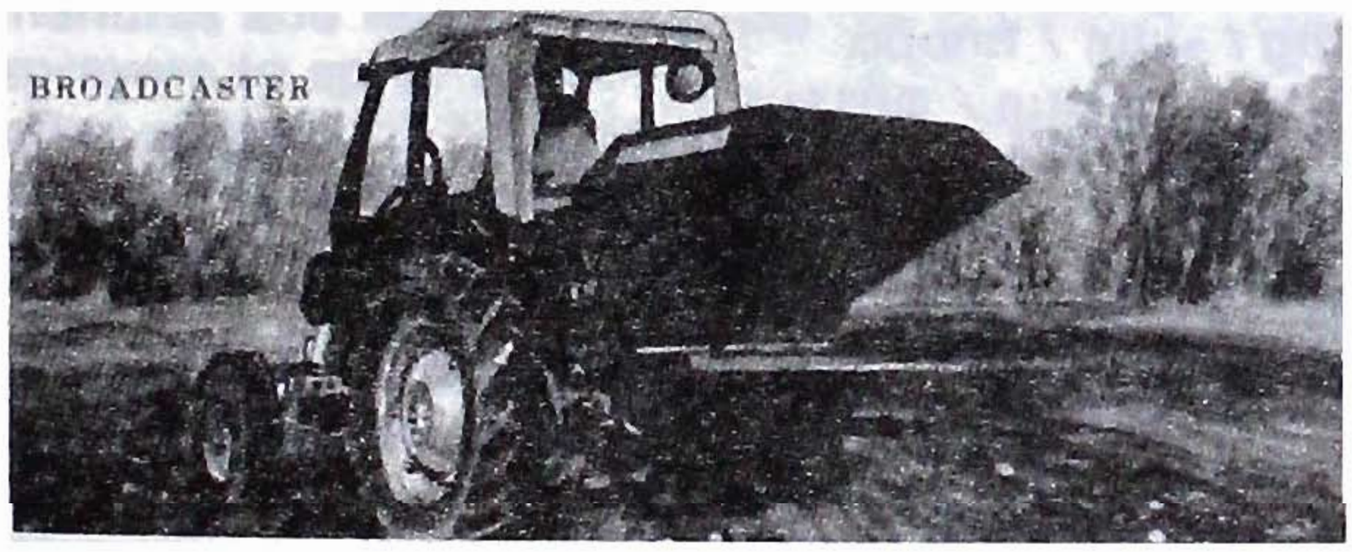


Fig. 41

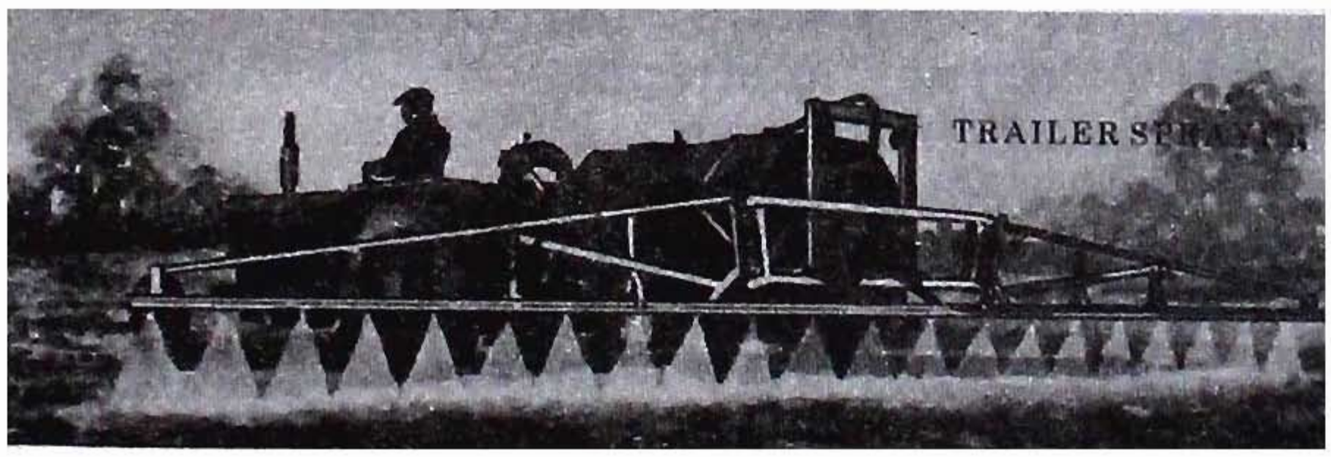


Fig. 42

10.1c **Study the following names of farm machinery. Classify them according to the category they belong to. Put the number of the category in front of them:**

— a. trailer
— b. planter
— c. spreader
— d. feeding hoppers
— e. beet planter
— f. thresher
— g. sprayer
— h. silo filler
— i. loader
— j. transplanting machinery
— k. grinding mill
— l. harrow
— m. tractor
— n. seeder
— o. hedge trimmer
— p. broadcaster
— q. mistblower
— r. crushing mill
— s. milking pumps
— t. cotton planter
— u. corn planter
— v. plow

Vocabulary

tractor / 'træktə / τρακτέρ
pulling / 'pulɪŋ / ἕλξη
lifting / 'lɪftɪŋ / ἀνύψωση
driving / 'draɪvɪŋ / μετάδοση κινήσεως
preparation / 'prepa ɪeɪɪn / προετοιμασία
plow / pləu / ἄροτρο
harrow 'hærəu / καλλιεργητής (σβάρνα)
seeding / sidɪŋ / σπορά
planting / 'plantɪŋ / φύτευση
corn planter / 'kɔn 'plantə / σπαρτική καλαμποκιοῦ
transplanting / 'tɹænsplantɪŋ / μεταφύτευση
spreader /'spid / μηχάνημα διασκορπισμού
broadcaster / 'bɹɔɔd'kastə / μηχανή γιά διανομή στα πετακτά
thresher / 'θreʃə / ἁλωνιστική μηχανή
silo / 'saɪləu / σιλό
filler / 'fɪlə / γεμιστής
mower or hay cutter / 'heɪ 'kʌtə / μηχάνημα κοπής σανού ή χόρτου
mill / mɪl / μύλος
crushing / 'krʌʃɪŋ / σύνθλιψη ή σπάσιμο
grinding / 'graɪndɪŋ / ἄλεσμα
harvesting / 'havɪstɪŋ / συγκομιδή
transportation / 'transpɔteɪʃn / μεταφορά
particular / pə'tɪkjʊlə / ἰδιαίτερος
powerful / 'paʊəful / ἰσχυρός
engine / 'endʒɪn / μηχανή
trailer / 'treɪlə / ρυμουλκούμενο ὄχημα
loader / 'ləʊdə / φορτωτής
hedge trimmer / 'hedʒ 'trɪmə /κλαδευτήρι φράκτη
saw / sɔ / πριόνι
furrow / 'fʌreʊ / αὐλάκι
disc / dɪsk / δίσκος

pile up / 'paɪl 'ʌp / συσσωρεύω
seeder grain drill /σπαρτική μηχανή με δοσομέτρηση
seeder / 'sidə / σπαρτική μηχανή μικρών σπόρων
roller / 'rəʊlə / κύλινδρος
press / 'pres / πιέζω
toss / tos / τινάζω /διασκορπίζω τινάζοντας
mistblower / 'mɪstbləʊə / νεφελοψεκαστήρας
feeding hopper / 'fidɪŋ 'hɒpə / τροφοδοτική χοάνη
milking machine /'/αρμεκτική μηχανή

Exercises

I. Say whether the following statements are TRUE or FALSE:

— 1. The farm work is done easier by people than by machinery.
— 2. There are six categories of farm machinery.
— 3. The tractor has a powerful engine.
— 4. We use only plows in the preparation of the soil.
— 5. There are many types of planters.
— 6. We use manures and fertilizers to help the growth of crops.
— 7. We use sprayers to spray fruit trees.
— 8. Broadcasters spread the fertilizer grains over the fields.
— 9. There are crushing and grinding mills.
— 10. The seeders make deep furrows in the earth.

II. Match a word or phrase from column A with a word or phrase from column B to make true and correct sentences:

A	B
1. Tractors pull	a. hedge trimmers.
2. The plow is used in	b. small seeds.
3. The planters are used	c. to spread fertilizer grains over the field.
4. We use spreaders	d. with mistblowers.
5. We spray chemicals onto the ground	e. crop machinery.
6. Tractors may lift	f. harvest time.
7. Hay cutters belong to	g. to drive things.
8. Threshers are used during	h. to drop seeds into furrows.
9. Tractors can be used	i. with sprayers.
10. The seeders are used for	j. to toss manure on the fields.
11. We spray fruit trees	k. trailers.
12. We use broadcasters	l. fertilizers.
13. The growth of the crops requires	m. the preparation of soil.

FINAL TEST

I. Which is correct in the following a, b or c?

1. We find zonal soils - - - - - - - -
   a. to be shallow.
   b. on gentle slopes.
   c. to reflect some local influence.
2. We find azonal soils - - - - - - - -
   a. to be shallow.
   b. on gentle slopes.
   c. to reflect some local influence.
3. We find intrazonal soils - - - - - - - -
   a. to be shallow.
   b. on gentle slopes.
   c. to reflect some local influence.
4. In young soils we've got - - - - - - - -
   a. two horizons.
   b. three horizons.
   c. four horizons.
5. Sandy soils contain more than - - - - - - - -
   a. 60%silicon and oxygen.
   b. 35% silicon and oxygen.
   c. 90% silicon and oxygen.
6. The action of the wind forms the - - - - - - - -
   a. loessial soils.
   b. alluvial soils.
   c. glacial soils.
7. The action of running water forms the - - - - - - - -
   a. loessial soils.
   b. alluvial soils.
   c. glacial soils.
8. Without chlorine the plant - - - - - - - - -
   a. hoses colour.
   b. grows more.
   c. has strong root.
9. We make soils neutral by using - - - - - - - -
   a. clay
   b. lime.
   c. acid.
10. The indication 10-20-10 in fertilizers means - - - - - - -
   a. nitrogen, phosphorus, potassium.
   b. nitrogen, potassium, phosphorus.
   c. phosphorus, potassium, nitrogen.
11. Nitro-chalk - - - - - - - -
   a. makes the soil peaty.
   b. makes the soil sour.
   c. does not affect soils.
12. Organic fertilizers are of - - - - - - - -
   a. animal origin only.
   b. vegetable origin only.
   c. animal or vegetable origin.

13. Barley is a - - - - - - - - -
    a. fibre crop.
    b. special use crop.
    c. grain crop.
14. Cotton grows in - - - - - - - - climates.
    a. cool
    b. warm
    c. cold
15. Millet is a - - - - - - - - crop.
    a. fibre
    b. cereal
    c. forage
16. Hay is a - - - - - - - - crop.
    a. fibre
    b. cereal
    c. forage
17. Sugar cane is a - - - - - - - -
    a. tropical plant.
    b. tropical grass.
    c. thread - like plant.
18. The variety of wheat we use for bread is - - - - - - - -
    a. hexaploid.
    b. tetraploid.
    c. diploid.
19. The kernel of rye is - - - - - - - -
    a. short and thin.
    b. long and thin.
    c. long and thick.
20. Upland rice grows - - - - - - - - irrigation.
    a. without
    b. with much
    c. with very much
21. Oats grow in - - - - - - - - climates.
    a. rather cool
    b. tropical
    c. very cold
22. The sugar cane requires - - - - - - - - to mature.
    a. 2-8 months.
    b. 3-6 months
    c. 8-24 months
23. By the term fruit we mean - - - - - - - -
    a. nuts and vegetables.
    b. flowers.
    c. both "a" and "b".
24. Parasites may be - - - - - - - -
    a. mites.
    b. viruses.
    c. both "a" and "b"
25. The Angora is a - - - - - - - - type of goat.
    a. wool
    b. prick eared
    c. drooping ears

26. The blackhead Persian is a - - - - - - - - type of sheep.
    a. milk
    b. woolless
    c. fur
27. The Pelvin is a - - - - - - - - type of sheep.
    a. milk
    b. woolless
    c. fur
28. The harrow is important - - - - - - - -
    a. as a planter.
    b. in the preparation of soil.
    c. as a seeder.
29. We use sprayers to - - - - - - - -
    a. spread fertilizers.
    b. toss manure.
    c. spray chemicals.
30. The growth of the crops requires - - - - - - - -
    a. manure only.
    b. fertilizers only.
    c. both "a" and "b".

II. Fill in the blanks in the following sentences with one of the words:

sedimentary	important	acidity
consists	chromosomes	overhead
effective	disadvantage	photosynthesis
monoecious		

1. Soils vary in - - - - - - - -
2. Clay soils have the - - - - - - - - of poor subsoils.
3. Alluvium is a - - - - - - - - material.
4. Plants obtain carbon from the air by - - - - - - - -
5. Nitrogen is very - - - - - - - - for cell division.
6. Compost - - - - - - - - of plant residues.
7. In the - - - - - - - - irrigation system the pipes are some distance above the plants.
8. Pipes below the soil give an - - - - - - - - - form of drainage.
9. We can classify the varieties of wheat by the number of - - - - - - - -
10. Corn is a - - - - - - - - plant.

III. Answer the following questions using one complete sentence for each answer:

1. Which are the three major groups of soil?
2. Why do we call the A horizon zone of leaching?
3. What do coarse soils include?
4. What does affect the colour of the soils?
5. What is the pH meter?
6. What makes the soil vary in acidity?

7. How many kinds of fertilizers are there?
8. What do potassic fertilizers include?
9. What do organic fertilizers do to foliage?
10. Why do we use dams in irrigation?
11. How many basic types of drainage exist?
12. What is irrigation?
13. What are sugar beets?
14. How many types of rice are there?
15. How do we call the sugar cane bunches?
16. How much is the sugar content in sugar beets?
17. How long does it take tobacco to mature?
18. What is a dry indehiscent fruit?
19. How can we identify the various diseases?
20. How many mating systems are there?
21. What is the inbreeding mating system?
22. What is animal husbandry?
23. What does the term bovidae mean?
24. How do we call male sheep?
25. What do the Angora and Cashmere goats produce?
26. What does farm machinery include?
27. What is a mistblower?

IV. Say whether the following sentences are TRUE or FALSE:

— 1. A soil profile is a vertical section.
— 2. In temperate climates there are normally more than two organic layers.
— 3. What do coarse soils include is sand.
— 4. The residuary soils are not original.
— 5. We call the macroelements micronutrients.
— 6. At maturity nitrogen moves into the seed.
— 7. Fertilizers may be only powder.
— 8. The subsurface irrigation system is expensive.
— 9. Oats is a type of grain.
— 10. The stalks of sorghum contain a sweet juice.
— 11. There are only spring varieties of barley.
— 12. Rice is very useful for its by-product.
— 13. The sugar cane deteriorates slowly.
— 14. A fruit is the final result of plant reproduction.
— 15. Bacteria and fungi cause different symptoms.
— 16. Poor aeration is a cause of non-parasitic diseases.
— 17. Dry forages include hay, straw, and fodder.