

3. Forage and livestock production systems in South-East Asia.

3.1 Forage systems.

3.1.1 Extensive permanent grassland.

In this system there are no inputs such as fertilizer, irrigation or controlled grazing. Most of these grasslands are overgrazed and often uncontrolled fires occur which burn all the grass. These grasslands can be:

- a) privately owned land;
- b) communally grazed land;
- c) communally grazed roadsides.

3.1.2 Semi-intensive permanent forages.

These forages can be forage plants underneath plantation trees (coconuts, rubber, oilpalm), forage from shade trees in plantations (leaves from shade trees), forage from around rice paddy bunds and edges of crop fields, and perennial forage in alley cropping. These forages benefit from inputs such as fertilizer, weeding and irrigation applied to the main cash crop.

eg: If fertilizer is applied to rubber trees, then the grass between the trees also gets some fertilizer.

3.1.3 Semi-intensive annual forages.

- a) forage crops sown after the harvest of food crops.

eg: *Crotalaria juncea* as a legume hay crop after rice or *Vigna unguiculata* (cowpea) as a legume forage with rice stubble after rice is harvested.

- b) crop residues.

eg: Rice straw, maize stalks, legume stems and leaves (eg: soybean residues), cassava leaves.

minerals than the grass. Therefore, the legume is the most important component in the pasture for the nutrition of the grazing animal.

8.3.2 Nitrogen fixation in the pasture system

The second role of the legume is that of symbiotic nitrogen fixation and the cycling of this nitrogen into the pasture system.

(a) Nitrogen cycle

A diagrammatic representation of the N cycle in grazed legume-grass mixtures is shown in Figure 8.1

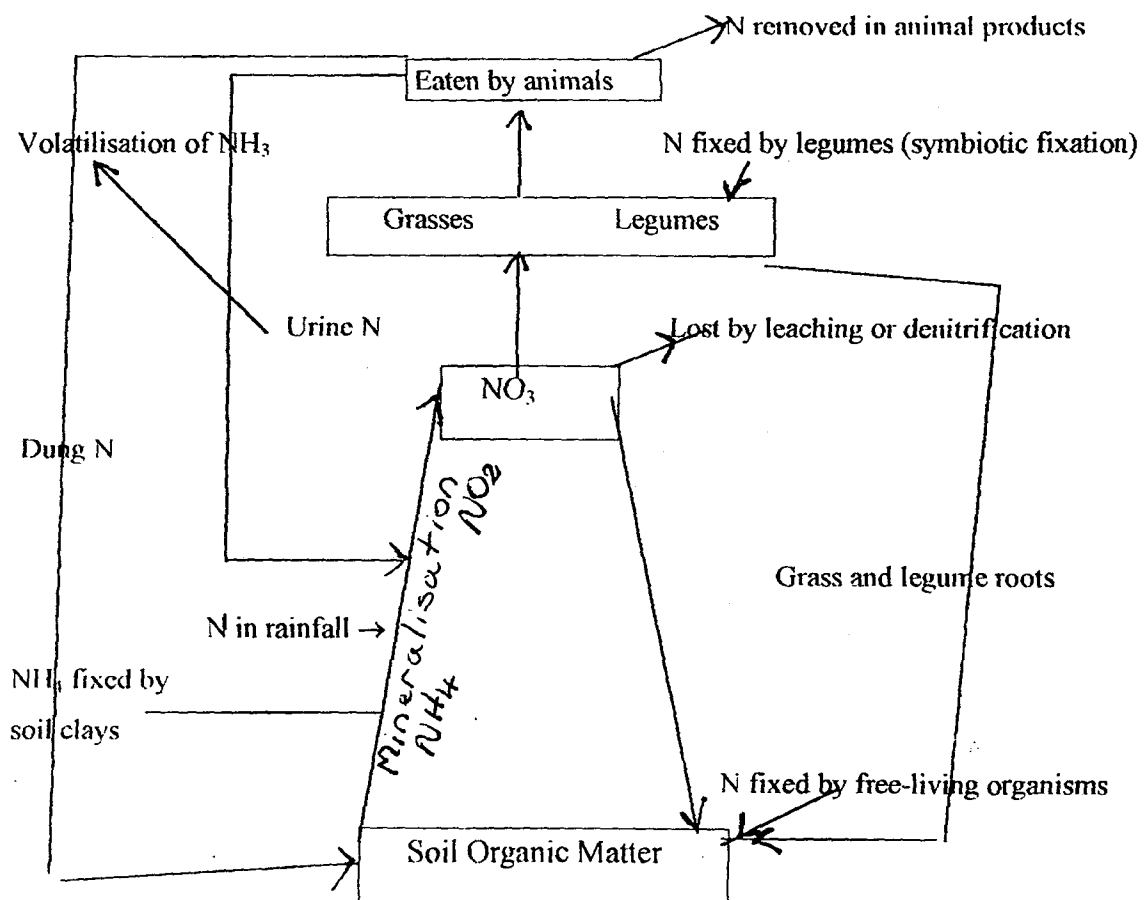


Figure 8.1 The nitrogen cycle in grazed legume-grass pastures

10.3 *Alysicarpus vaginalis*

Common names: Alyce clover,

Thua lisongna (Thai).

Alyce clover is an prostrate annual or short-lived perennial used as a native legume in grazed pastures. If left ungrazed it will grow very erect. It is used as a cover crop in Papua New Guinea and in rubber plantations in Indonesia. It also has medicinal properties.

Alyce clover will grow on a wide range of soil types but it requires good drainage. It will not tolerate waterlogging. It is better suited to the dry areas where it behaves like an annual. At Ubon Ratchathani University it behaves as an annual.

It does not require inoculation, as it nodulates freely with native rhizobium in the soil. It seeds well.

Alyce clover is very palatable for animals and makes very good hay. It will tolerate frequent defoliation and grazing. More research should be done on this important native legume.

10.4 *Arachis glabrata*

Common name: Rhizoma peanut.

A low growing perennial legume with a taproot and rhizomes forming a thick mat in the top 5 cm of soil.

Rhizoma peanut is primarily used as a high quality forage legume for intensively grazed pastures on infertile, acid soils. In the USA it has been used to make hay. It prefers well drained soils.

Its major limitation is that it sets few seeds and must therefore be propagated from rhizome cuttings. It will grow with many dense, low growing grasses such as carpet grass, pangola grass and bermuda grass.

Overall, it is a persistent, very productive, high-quality forage, well adapted to infertile, acid soils and heavy grazing pressure. More use of this legume should be made of in Thailand. Lack of seed is its major limitation.

10. Pasture legumes for the tropics

Well adapted pasture legumes are available for all regions of the tropics. In this section the main legume plants will be described that are of most use in Thailand.

10.1 *Aeschynomene americana*

Common names: American jointvetch;

Sano-don, Sano-bok, Sano khon (Thai).

American jointvetch is used as a cut and carry forage, as a hay crop, as a pasture legume and as a green manure crop in rice and other cropping systems.

The plants are erect, shrub-like legumes, which are heavy seeding and can be self regenerating annuals (cultivar Glenn) or short-lived perennials (Cultivar Lee), with crowns surviving up to 2-4 years. The plants readily nodulate with native cowpea type inoculants in the soil.

American jointvetch is very tolerant of flooding and hard grazing but it does not like long dry periods (it is not drought tolerant). It is extremely palatable and nutritious with crude protein levels up to 25%. Seed is very easy to harvest.

Its main attributes are its ability to thrive on low-lying, wet, rather infertile soils and to provide a lot of very palatable forage. Its main deficiency is its low drought tolerance and lack of feed during the dry season.

American jointvetch is presently being evaluated on the Ubon Ratchathani university farm because of its tolerance of wet sites.

10.2 *Aeschynomene falcata*

Common name: Jointvetch.

Joint vetch is a prostrate perennial for grazed pastures and is not suitable for cut and carry systems.

It will tolerate both droughts and temporary waterlogging. It is extremely palatable and will tolerate hard grazing. Seed should be inoculated with the appropriate rhizobium strain, but effective nodulation may be achieved from native strains in some soils. It is tolerant of low fertility soils. Jointvetch will combine with a range of pasture grasses.