for the nonprotein fraction was 51 to 66% amino nitrogen in all samples. The ammonia nitrogen content of the nonprotein fraction was 18 to 26% for the sun-cured samples, 7 to 16% for the dehydrated samples, and 17 to 19% for the succulent samples.

The procedure outlined affords a means for bringing practically all of the nitrogenous material of alfalfa into solution and separating it from the insoluble fiber. The nitrogen fraction thus obtained may then be subjected to chemical assay and to animal nutrition investigators as the sole source of protein nitrogen in the diet. Present attempts to assess the nutritive value of whole alfalfa as a protein source are subject to several criticisms. First of all, the high content of fibrous material in alfalfa may exert an adverse effect on growth. Second, the growth inhibitor postulated to be present in alfalfa presents an added problem in determining the nutritive value of whole alfalfa. The nitrogen fraction, as obtained by alkaline extraction, has the further advantage of being truly representative of the total alfalfa nitrogen. The importance of alfalfa in the production of protein nitrogen for food may be readily appreciated by comparing the yield of protein per acre per year from alfalfa with that from other crops. — Raymond Borchers and C. W. Ackerson, Department of Agricultural Chemistry, University of Nebraska, Lincoln, Nebr.

TOLERANCE OF YOUNG SEEDLINGS OF LESPEDEZA AND KUDZU TO COLD AND NAPHTHA

SEEDLINGS of common lespedeza, *Lespedeza striata*, have remarkable tolerance to cold during the two-leaf or cotyledonal stage. At the Soil Conservation Service Nursery, Thorsby, Ala., approximately half of the early germinated seedlings survived minimum temperatures of 8° F on February 2 and again February 3, 1951, without protective cover. At the same nursery during the first week of March 1943, all two-leaf seedlings of common lespedeza endured a minimum of 10° F for one night without cover. On two previous occasions, the writer observed similar seedlings at Athens, Ga., endure minimum temperatures slightly below 20° F.

Under field conditions in the Southeastern United States, this high tolerance to cold is lost with the development of the third or fourth leaf. A light to moderate frost has frequently killed seedlings of common lespedeza in the four-leaf stage.

Similar cold tolerance in the cotyledonal stage has been observed at minimum temperatures below 32° F but above 20° F for the following seedlings:

- Kobe lespedeza, *Lespedeza striata*
- Korean lespedeza, *Lespedeza stipulacea*
- Bush lespedezas: *Lespedeza bicolor*  
  *Lespedeza cyrtobotrya*  
  *Lespedeza Thunbergii*
- Sericea lespedeza, *Lespedeza cuneata*
- Partridge pea, *Chamaecrista fasciculata*
- Kudzu, *Pueraria Thunbergiana*

These seedlings also lose tolerance to cold with the development of the third or fourth leaf.

When the use of naphtha spray became a standard method of weed control in pine seedling nurseries, the writer wondered if the lespedeza and kudzu seedlings at the two-leaf stage might be able to tolerate the light oil.

Karl Graetz at the Soil Conservation Service Nursery, Sandy Level, Va., tried a light spray of naphtha (Varsol) over young seedlings of *Lespedeza bicolor, L. formosa*, and *L. japonica* during the early spring of 1949. The lespedeza seedlings were not injured, but the small crab grass seedlings were killed. Mr. Graetz was encouraged to continue this spray method of weed control on the bush lespedeza seedlings and to extend it to kudzu.

Experience to date indicates that naphtha spray can be used on both bush lespedeza and kudzu in the two-leaf stage if applied at air temperatures below 70° F with protection from sunlight by clouds or burlap shades. At later stages, the lespedeza and kudzu seedlings were injured too much by the naphtha spray.

These observations are reported with the hope that some research worker will study the cold endurance of lespedeza and kudzu seedlings and other associated tolerances. — Paul Tabor, U.S.D.A., Soil Conservation Service, Spartanburg, S. C.