

MEMORANDUM IN REGARD TO PLANTS THAT MIGHT BE FOUND
WEST OF PEIPING, IN MONGOLIA AND ESPECIALLY IN THE
GOBI DESERT.

Attention should be called to the fact that explorers in this region would do well to collect seed of everything found and that the notes on the habit of growth of the species or variety should be as full as possible so that as much information as possible may be available when the variety is subsequently tested in the United States. It is quite possible that there may be varieties or strains of well-known species and that such varieties or strains may be useful even though the species itself is known to be without much use. The data below covers, first, legumes and, second, grasses.

LEGUMES

Melilotus. It is highly desirable that seed of any species of Melilotus found west of Peiping or in Mongolia be secured. The species known to occur broadly in this general territory are listed below.

1. Melilotus dentatus Pers. Some material believed to be of this species was secured some years ago and is now under trial in co-operation with the Wisconsin Agricultural Experiment Station. There seems reason to hope that the plants secured may be extremely useful for breeding purposes, with a view to eliminating the cumarin content so undesirable in the regular sweet clovers.

The material secured appears to be referable to the species M. dentatus, but is an annual, while this species is described as being a biennial. The exact identity of the form we have is, therefore, at present uncertain.

M. dentatus is a plant some 30 to 40 cm. high; flowers pale yellow; stipules incised or dentate; leaflets of the lower leaves elongate-elliptic rather than obovate; leaflets of the upper leaves elongate-linear with numerous acute, almost thorn-like teeth and protruding veins. The species is said to grow in steppe meadows, mostly on alkaline soils. It is said to occur among other places in western Mongolia, as well as in the Transbaikial provinces of Siberia. Emphasis is placed on this species because, in our opinion, any collections of this species may be extremely useful for purposes of breeding.

Other species of Melilotus that may occur in Mongolia are M. altissimus Thuill., M. suaveolens (Ldb.), M. hirsutis (Lipsky), and M. officinalis Desr. While M. officinalis is, at present, very common in the United States, it is quite possible that forms may occur in Mongolia that will be of value.

Medicago. Medicago ruthenica and Medicago platycarpa are reported as occurring in the part of Mongolia through which the explorers will pass--Medicago platycarpa especially in the extreme north of the Gobi desert. Medicago falcata is not reported but it might be found occasionally. It would be desirable to secure seed of any wild species of Medicago found growing in Mongolia and small samples of any forms of sativa that may be used as a cultivated crop in this region. M. ruthenica would be desirable for breeding purposes in this country and varieties of sativa that flourish or at least survive on the edge of the Gobi desert should, theoretically, be rather drought-resistant. Seed of these varieties would, therefore, be desirable.

Lespedeza. About 120 species of the genus have been described. Of these, we have secured for our introduction and experimental nursery something like 20 or 30. It is highly desirable, therefore, that seed of any species of lespedeza that may be found be secured to add to this collection in the hope that other valuable varieties may be found besides those that have already proven so important in the agriculture of the South.

Lespedeza stipulacea and Lespedeza striata are the only two known annual species. Some time ago seed was secured under the name of Lespedeza medicaganoides, but this was found to be Lespedeza stipulacea. If any other annual species should be found to occur in Mongolia, it would be very desirable to secure seed. It would also be desirable if the explorers could secure seed of any strain of Lespedeza striata or Lespedeza stipulacea found, since strains of this sort may be extremely valuable and no conclusion can be reached until after they have been actually tried in this country.

We happen to have material of every species of lespedeza recorded from Mongolia, but a list is given below of species known to occur in other parts of China in the hope that the explorers may be able to secure seed of some of these, either directly or through correspondence with men in other parts of China.

<u>Name of species</u>	<u>Location, in China</u>
L. alata (Schindl.) Ricker	Yunnan
L. argentea (Schindl.) Ricker	"
L. atrokermesina Forrest	" , Szechuan
L. balfouriana Diels	" , S. W. Szechuan
L. bodinieri (Schindler) Lev.	Kuei-chou, Tsinga
L. bonatiana Pamp.	Yunnan
L. bonii (Schindl.) Gagnep.	Indo-China; Tonkin
L. capillipes Franch	Yunnan
L. caraganae Bunge	North Shensi, Honan, Shantung, South Kansu, Chihli.
L. davidi Franch	Kiangsi, Tukien, Kweichow, Chekiang, Honan.
L. delavayi Franch	Yunnan

<u>Name of Species</u>	<u>Location, in China</u>
<i>L. dielsiana</i> Schindl.	Szechuan
<i>L. distincta</i> L. H. Bailey	Honan-Hupeh border
<i>L. diversifolia</i> Hemsl.	Yunnan
<i>L. dunnii</i> Schindler	Fukien
<i>L. esquirolii</i> (Schindler) Ricker	India: Punjab
<i>L. fordii</i> Schindler	Korea, Japan, China: Che-kiang, Kuangtung
<i>L. forrestii</i> Schindler	Yunnan
<i>L. fulva</i> (Schindl.) Ricker	Yunnan
<i>L. giraldui</i> Schindler	Formosa; China--Shensi, Honan, Hupeh, Kansu.
<i>L. glauca</i> Schindler	Szechuan
<i>L. grandiflora</i> (Schindl.) Ricker	Yunnan
<i>L. harmsii</i> (Schindl.) Ricker	Yunnan
<i>L. Henryi</i> Schindler	Yunnan: Indo-China, Laos
<i>L. hirtella</i> Franch.	Yunnan: Thibet, Tse-kou
<i>L. howellii</i> (Schindl.) Ricker	Northwest Yunnan
<i>L. latifolia</i> Dunn.	Yunnan
<i>L. monoyeri</i> Lev.	Yunnan; dry terrains of La Kou
<i>L. muehleana</i> Schindler	Szechuan, Hupei
<i>L. nakai</i> Ricker	Yunnan
<i>L. nantcianensis</i> Pamp.	Hupei on Mt. Nan-teian
<i>L. paniculata</i> (Schindler) Ricker	Northeast Yunnan
<i>L. parviflora</i> Kurz.	Siam: India: Martaban China: Yunnan
<i>L. polyantha</i> (Franch.) Schindler	Yunnan, Szechuan, Kweichow
<i>L. prainii</i> Collett and Hemsl.	Yunnan India: Burma
<i>L. rockii</i> (Schindl.) Ricker	Yunnan
<i>L. sargentiana</i> (Schindler) Ricker	Northwest Szechuan Japan: Kiusiu
<i>L. schneideri</i> (Schindler) Ricker	Southern Szechuan Japan: Sendai
<i>L. souliei</i> (Schindler) Ricker	China: Batang
<i>L. sulcata</i> (Schindler) Ricker	Yunnan
<i>L. trigonoclada</i> Franch.	Yunnan, Szechuan
<i>L. velutina</i> Dunn.	Yunnan
<i>L. viatorum</i> Champ.	Kwantung, Hongkong, Chekiang
<i>L. wilsonii</i> (Schindl.) Ricker	Szechuan
<i>L. yunnanensis</i> Franch.	Yunnan

Miscellaneous Legumes. The following list of miscellaneous legumes covers species reported as occurring in Mongolia. It will be noted from the notes appended that we have already secured seed of some of these species while others have not been secured. It will be desirable if the explorers can secure seed of some of the species included in the list below, so as to add to our collection for trial.

Cassia mimosoides L. - This has been introduced a number of times and is an annual much like our common Cassia nictitans. It has been included in our test gardens but apparently has nothing to it to recommend it over the common species of this country.

Thermopsis fabacea DC. - This has been introduced from this region and included in test garden plantings but apparently has little to recommend it.

Medicago lupulina L. - Common black medic. Introductions from out-of-the-way places would be desirable.

Indigofera kirilowii Maxim. - This has been introduced a number of times from this general region and the species is available in the commercial trade. Shrub not of interest as forage.

Caragana Chamlagu Lam. - This has been introduced and is established in a few plantings.

Caragana frutescens DC. - A shrubby ornamental Caragana already in the United States. Not of interest as forage.

Gueldenstaedtia pauciflora Fisch. - This has never been introduced and is a very low shrubby drought-resistant type of plant which should be of interest for introduction.

Astragalus adsurgens Pall. - This has been introduced and distributed in recent years in our experimental plantings.

Astragalus dauricus DC. - This has been introduced and distributed in experimental plantings in recent years.

Astragalus penduliflorus Lam. - This has been introduced but never established in experimental plantings.

Oxytropis oxyphylla Pall. - This has been introduced but has never become established in experimental plantings.

Oxytropis manshurica Bunge. - This has not been introduced.

Oxytropis hirta Bunge. - This has been introduced recently but not established.

Hedysarum alpinum L. - This has been introduced but not established in experimental plantings.

Glycyrrhiza pallidiflora Max. - This has never been introduced.

Desmodium polocarpum DC. - This has not been introduced.

Desmodium Oldhami Oliver. - This has been introduced but not established in experimental plantings.

Vicia amoena Fischer. - This was introduced and established in experimental plantings.

Vicia Pseudo-Orobus F. et M. - Introduced and established in experimental plantings.

Vicia cracca L. - Introduced and established in experimental plantings.

Vicia tridentata Bunge. - Not introduced from this region.

Vicia unijuga A. Br. - Introduced and established in experimental plantings.

Lathyrus Davidi Hance. - Introduced but not established in experimental plantings.

Lathyrus humilis Fischer. - Not introduced.

- 5 -

Lathyrus maritimus Bigel. - Introduced and established in experimental plantings.

Lathyrus palustris L. - Introduced and established in experimental plantings.

Falcata japonica (Oliver) - Introduced and established in experimental plantings.

Pueraria Thunbergiana Benth. - Common kudzu. Introduced and established in commercial plantings.

Phaseolus minimus Roxb. - Introduced and established in experimental plantings.

Crotalaria sessiliflora L. - Introduced and established in experimental plantings.

In addition to the list given above, the following from the same general region are of interest:

Gueldenstaedtia monophylla - This is reported from Siberia. Other species of Gueldenstaedtia occur in the dryland regions, of central China and may range over to the Gobi desert region.

Dunbaria villosa - This has been introduced and grown in experimental plantings.

Soybeans. The Division of Forage Crops and Diseases is very much interested in securing seed of any type of the wild soybean, Soja usenriensis, for breeding work. We have seed of these species from as far North as the Great Wall and from Manchuria, Korea and Japan. It is reported that there are early types north of the Great Wall, one German investigator stating that there were types there which matured in about 75 days. We have never been able to secure seed of these earlier types and would like, especially, to emphasize the importance of the explorers looking for types of these earlier soybeans.

It is probable that there may be found in the region of northern China above Kalgan early varieties of cultivated soybeans and of Mung beans (Phaseolus aureus), which should be of value for the extreme northern part of the United States. Mung bean varieties from the Kalgan region are said to be especially valuable for sprouts. Seed of any or all species of Soja, Vigna and Phaseolus are desired.

GRASSES

Below is a memorandum prepared by Mr. H. N. Vinall, and which gives the information we have been able to secure on the grasses in this region. It will be noted that Mrs. Chase calls attention to the fact that the region toward the Gobi is very little known botanically and that species, at present quite unknown, may be found. It is hoped that the explorers will secure seed and herbarium material of any species of grass found.

List of Grasses Reported from the Region
Between Peiping and the Gobi Desert

"The region toward the Gobi is very little known botanically, especially for grasses, since most collectors neglect grasses. One looking for grasses might find many more than the species here indicated." - Agnes Chase, Associate Botanist, National Herbarium.

Aeluropus littoralis Parl. - Low perennial, creeping rhizomes; sand or mud flats; little forage value.

Agropyron spp. - All perennials, mostly rather tall; all good forage.

A. cristatum (L) Gaertn. - Slopes, open ground. Already introduced in U. S.

A. Gmelini (Griseb.) Scribn. & Smith - Open slopes.

A. semicostatum Nees - Shady slopes.

Agrostis spp. - All good forage.

A. clavata Trin - Tufted perennial; open slopes.

A. hugoniana Rendle - low perennial; steppes and open slopes.

A. tenuis Sibth. - Tufted perennial; open moist ground. Already extensively introduced in U. S.

Alopecurus arundinaceus Poir. - Tufted perennial; 1 to 2 feet tall; hill slopes; probably good forage.

Bromus inermis - Leyss.-- Smooth brome. - Tall perennial; prairie. Already introduced in U. S.; good forage grass.

Bromus tectorum L. - Weedy annual; open roadsides, etc.; no value, injurious to grazing animals; widely introduced in western U. S.

Calamagrostis spp. - All perennial; mostly tall; all good forage.

C. arundinacea (L) Roth. - Slopes and valleys.

C. epigejos L. - Moist, often sandy ground.

C. pseudophragmites (Hall.) Koel. - Open ravines, moist slopes.

Deschampsia caespitosa (L) Beauv. - Tufted perennial; 1 to 3 feet tall; prairies. Eurasia, America. Common in uplands of western U.S. Excellent forage.

Diarrhena manschurica Maxim. - Perennial; 2 to 3 feet tall; woods; value unknown.

Digitaria ischaemum (Schrab.) Muhl. - Annual weed in fields, weedy banks; Eurasia, introduced in North America, common in the U.S. where it is a bad weed in lawns. Commonly called smooth crabgrass.

Elymus dahuricus Turcz. - Perennial, 2 to 3 feet tall; slopes and canyon bottoms. Probably good forage.

Elymus dasystachyus Trin. - Perennial, 2 to $2\frac{1}{2}$ feet, open ground; good forage.

Elymus sibericus L. - Perennial, 2 to 3 feet tall; open or shaded slopes; probably good forage.

Eragrostis poaeoides Beauv. - Weedy annual; introduced in U.S.; no forage value.

Hierochloa glabra Trin. - Slender perennial with rhizomes; moist ground; probably no forage value.

Hordeum brevisubulatum (Trin.) Link. - Tufted perennial; dry ground. May have some forage value; awns short, less injurious probably.

Hordeum nodosum L. - Perennial, grasslands; heads injurious at maturity; has forage value when young. Already introduced in U.S.

Koeleria cristata () Pers. - Tufted perennial; prairies. Eurasia, America. Common in middle and western U.S. Fair forage.

Melica gmelini Turcz. - Perennial, 2 to 3 feet tall; shady slopes; probably good forage.

Melica grandiflora Koids - Perennial 1 to 2 feet tall; woods, moist ground; probably good forage.

Melica radula Franch - Perennial, 1 to 2 feet tall, stony places; probably good forage.

Melica virgata Turcz. - Perennial, 2 feet tall; rocky ground; probably good forage.

Molina serotina Mert. & Koch. - Leafy perennial, 1 to 2 feet tall; low ground; probably good forage.

Panicum miliaceum L - Coarse annual; cultivated for its seeds in China, commonly escaped. Introduced in U.S., where it is called hog millet, proso, and broomcorn millet.

Pappophorum brachystachyum Jaub. & Spach. - Low tufted perennial; dry ground; good forage.

Pennisetum flaccidum Griseb. - Perennial, 1 to 3 feet tall; dry open slopes; probably good forage.

Phalaris arundinacea L. - Tall perennial with rhizomes; swampy places. Eurasia and North America. Common in northern U.S.; good forage.

Poa spp. - All perennial, all good forage.

P. alta Hitchc. - Open slopes.

P. arctica R.Br. - Alpine regions, circumpolar; in U.S. and Brit. America.

P. compressa -L. - Common in U.S.

P. mongolica (Reudle) Keng - Woods and open slopes.

P. pratensis L. - common in U.S.

P. shansiensis Hitchc. - Shady slopes.

P. sibirica Roskev. - Larch forest.

P. sphondylodes Trin. - Slopes, valleys.

P. subfastigiata Trin. - Open slopes.

Puccinellia distans (L) Parl - Tufted perennial, 1-2, 5 feet; dry, often alkaline soil. Eurasia and North America; alkaline spots in western U.S.; some forage value.

Setaria virides (L.) Beauv. - Weedy annual, waste ground, weed in fields. Eurasia, introduced in U.S.; rather common weed, called green foxtail or green bristle-grass.

Spodiopogon sibiricus Trin. - rather stout perennial, 2 to $3\frac{1}{2}$ feet tall; shaded slopes and thickets. Probably little forage value.

Sporobolus piliferus (Trin.) Kunth - Low weedy annual, rocky hilltops; no value.

Stipa spp. - All rather tall tufted perennials; all good forage, but the sharp pointed seeds with long awns which untwist and twist in moisture and dryness, are injurious, especially to sheep.

S. breviflora Grisch - dry clay soil.

S. capillata L. - Dry mountain slopes.

S. gobica Rosher. - 8 to 15 inches tall; rocky ground, desert.

S. mongholica Turcz. - Slopes, plains.

S. przewalskyi Rosher. - Grasslands.

S. sibirica (L) Lam. - Forested slopes.

S. splendens Trin. - 3 to 4 feet tall; open slopes, loess ridges.

Tripogon chinensis (Franch.) Hack. - Slender tufted perennial; rocky hills; probably no forage value, foliage scant.

