PLANT GERMPLASM COLLECTION REPORT

USDA-ARS
FORAGE AND RANGE RESEARCH LABORATORY
LOGAN, UTAH

Foreign Travel to:
Novosibirsk and Altai Mountains, USSR
August 1 - August 30, 1989

TITLE: Collection of Forage Germplasm in South-Central Siberia.

U.S. Participants

Douglas R. Dewey - Research Geneticist (Deceased)
USDA-Agricultural Research Service
Logan, Utah U.S.A.

Kevin B. Jensen - Research Geneticist
USDA - Agricultural Research Service
Logan, Utah U.S.A.

GERMPLASM ACCESSIONS

PURPOSE OF TRAVEL: To expand the resources of the National Plant Germplasm System (NPGS) by collecting seeds of the perennial grasses of the tribe Triticeae and other forages in South-Central Siberia. To establish cooperative research projects with scientists of the Central Siberian Botanical Garden (CSBG), Novosibirsk, USSR.

HIGHLIGHTS: The USSR Academy of Sciences, through the CSBG, sponsored the trip and covered its costs with the exceptions of the round-trip airfare from Salt Lake City to Moscow, camping supplies needed by the US team, and a few miscellaneous expenses. The actual cost to ARS (apart from Jensen's salary) was less than $4,000. All arrangements were satisfactory and no serious problems were encountered with travel or logistics in the USSR. The CSBG provided a large truck and a van (with drivers), an interpreter, and other necessary logistical support.

Several days were spend at the beginning and at the end of the trip examining seed-protein electrophoretic work and discussing the possibility and nature of cooperative projects between the FRRL at Logan and the Laboratory for Introduction of Forage Plants at Novosibirsk. Alexander and Olga Agafonov (husband and wife research team) are studying many of the same Triticeae species that are important to several projects the FRRL in Logan.

The main part of the trip, 7 August-24 August, was spent camping and field collecting along a 800-kilometer route form Novosibirsk to Aktash in the Altai Mountains near the USSR-Mongolia-China borders (Appendix). This area is rich in perennial Triticeae species. About 300 seed collections were made in the field. Some of the collections are of considerable taxonomic-

cytogenetic interest and others appear to have immediate practical importance as forage grasses. We collected several species unknown to us and not previously included in the NPGS. Large collections were made of 2 or 3 as yet unidentified species of Pseudoroegneria tolerant to grazing, which differ from our grazing-sensitive North American species. Collections of Agropyron (crested wheatgrass), and Psathyrostachys juncea (Russian wildrye) will be important to the breeding programs at Logan and other US locations. Extensive collections were made of many species of Elymus, which from the basis of the Agafonov's research and are of taxonomic interest to us.

After our return to Novosibirsk, we were given complete access to the seed collections that the Agafonovs had made in previous expeditions (1985-1988) to the Soviet Far East, Kazakhstan, and Khirgizia. About 100 collections were made from this source and from field plots at the CSBG. Seed from a strongly rhizomatous collection of Agropyron cristatum, originally from the Lake Baikal region, was collected from the field plots. A rhizomatous crested wheatgrass has great economic potential for revegetating arid US rangeland. A rare and endangered species of Elymus, originally from Kemerovo Region east of Novosibirsk, was obtained from the field plots. This species has the characteristics of the hypothetical donor of the **Y** genome, which is found in many species of Elymus. Identification of the source of the **Y** genome would e a major scientific find.

More than 400 collections were obtained during the expedition (Appendix). The cost to ARS of less than $10 per collection is unheard of for a major plant-collecting expedition. We hand-carried the seed to the US. After passing through customs and plant-quarantine procedures, the seed arrived at Logan on 6 September, just a week after we left the USSR. Such expeditious receipt of seed from a foreign expedition is extremely unique. The unusually low cost and immediate receipt of the seed resulted from direct scientist-to-scientist collaboration and the avoidance of bureaucratic entanglements common to both countries.

RECOMMENDATIONS: Before being entered into the NPGS, all Triticeae collections from the expedition should be grown at Logan for further description (including a chromosome count), verification of their taxonomic identity, possible consolidation of some collections, and initial seed increase if original seed is very limited (which it usually is). The non-Triticeae collections should be sent to other scientists who are willing and qualified to grow and describe them. If no one is willing to take the non-Triticeae collections, they will be grown and described at Logan as best we can. Only after preliminary description and evaluation, should the collections be formally entered into the NPGS. These procedures will keep the NPGS from being swamped with accessions that are undescribed, duplicative, misidentified, or useless. Plant collectors should be willing to take responsibility for the material they collect or they should not collect it.

Most, if not all, plant-collecting expeditions (and probably most other scientific exchanges) should be done on the basis of "receiving side pays". This procedure is by far the most economical because it precludes the host country from charging foreign visitors exorbitant rates and fees. It is also more equitable because it compensates for the differences in living standard

and ability to pay. Countries like the USSR and China have great difficulty in send delegations to the US on a "sending side pays" basis because they lack foreign currency.

The opportunity must be given to a 2-person Soviet team (Olga and Alexander Agafonov) to come to the US for a month under the same arrangements that we went to the USSR, i.e., they pay their round-trip airfare to the US and we cover their expenses within the US. We suggest July 1990 for the exchange visit, which would involve both work in the FRRL at Logan and some plant collecting in the Intermountain Region. We at Logan should determine a reasonable per diem rate based on local conditions and the nature of the itinerary. The exchange visit should be implemented at the scientists-to-scientist level and kept as simple and uncomplicated as was our visit to the USRR.

Appendix #1. Seed Collections from the Dewey-Jensen Expedition.

Genus	**Species**	**No. Collections**
Acer	barbinerve	1
Acer	mono	1
Acer	tegumentosum	1
Acer	ukurunduense	2
Agropyron	cristatum	28
Agrostis	trinii	1
Astragalus	spp.	4
Brachypodium	spp.	4
Bromus	inermis	7
Bromus	spp.	1
Dactylis	glomerata	2
Deschampsia	caespitosa	1
Deschampsia	spp.	1
Elymus	abolinii	8
Elymus	amurensis	4
Elymus	batalinii	1
Elymus	caninus	18
Elymus	ciliaris	1
Elymus	confusus	10
Elymus	dahuricus	11
Elymus	dentatus	3
Elymus	drobovii	1
Elymus	excelsus	5

Elymus	fedtschenkoi	2
Elymus	fibrosus	5
Elymus	glaucissimus	2
Elymus	gmelinii	20
Elymus	komarovii	1
Elymus	macrochaetus	1
Elymus	mutabilis	19
Elymus	novae-angliae	3
Elymus	nutans	2
Elymus	pendulinus	9
Elymus	praecaespitosus	1
Elymus	sibircus	14
Elymus	tianshanicus	1
Elymus	trachycaulus	20
Elymus	transbaicalensis	2
Elymus	tschimganicus	2
Elymus	ugamicus	4
Elymus	spp.	38
Elytrigia	repens	10
Elytrigia	spp.	6
Festuca	rubra	2
Festuca	spp.	4
Hedysarum	jubatum	3
Hedysarum	violaceum	1
Hordeum	jubatum	3
Hordeum	violaceum	1
Lathyrus	spp.	1
(Leguminoseae)	spp.	1
Leymus	akmolinensis	1
Leymus	angustus	3
Leymus	mollis	4
Leymus	racemosus	3
Leymus	ramosus	1
Leymus	secalinus	4
Leymus	spp.	8

Medicago	falcata	8
Medicago	platycarpa	3
Onobrychis	sibirica	1
Onobrychis	spp.	4
Phalaris	arundinacea	1
(Poaceae)	spp.	1
Psathyrostachys	juncea	17
Psathyrostachys	spp.	2
Pseudopyron	spp.	8
Pseudoroegneria	geniculata	1
Pseudoroegneria	pruinifera	1
Pseudoroegneria	stipifolia	1
Pseudoroegneria	spp.	41
Stipa	capillata	2
Stipa	sibirica	1
Stipa	spp.	2
Thinopyrum	nodosum	2
Trifolium	lupinaster	3
Trifolium	medium	1
Trifolium	pratense	3
Trifolium	spp.	1
Vicia	cracca	1
Vicia	spp.	5
	TOTAL	426

Appendix #2. Travel Details of the Dewey-Jensen Expedition.

1-2 Aug 89 Travel from Salt Lake City to New York to Moscow. Left SLC at 10:00 a.m. on 1 August and arrived in Moscow at 2:30 p.m. on 2 August. Round-trip airfare from SLC to Moscow was $1,297. Met at Moscow airport by a representative of the USSR Academy of Science and housed at the Academy hotel until we left for Novosibirsk later that night.

2-3 Aug Left Moscow at 11:00 p.m. on 2 August for a 3-5 hour flight to Novosibirsk. Met at airport in early a.m. on 3 August by Alex and Olga Agafonov et al. and taken to a hotel in Academy Town (Akademie Gorodok) which is 25 kilometers from Novosibirsk.

4-6 Aug Visited the Central Siberian Botanical Garden (CSBG) and made preparations for the field trip. Observed and discussed the seed-protein (promaline) electrophoretic work of Agafonovs and spent some time in the CSBG herbarium. Did some collecting int the woods around Academy Town and in the field plots at the CSBG.

7 Aug Let on the field trip with a large supply truck and 8-10 passenger vans. The 11-person party consisted of D. R. Dewey and K. B. Jensen. Alex and Olga Agafonov and their 14-year-old-daughter, Marina. Helen Chernykh, a 36-year-old dendrologist and interpreter. Vladimir Shamanyan, a young virologisit who spoke English. Viktor Polokov (campmaster) and is 25-year-old-daughter, Diana. Two drivers, both named Yuri.

Our primary route was on Highway M-52, which goes from Novosibirsk to Tashkanta near the border with Outer Mongolia. The highway kilometer markers served as reference points for collecting sites. Altitudes were estimated from a pocket altimeters, which was subject to changes in barometric pressure.

Spent the night in the village of Troitskoe in the house of Olga Agafonova's parents, about 300 km S of Novosibirsk.

8 Aug Traveled to a field station of the CSBG at Kamlak, about 500 km SSE of Novosibirsk.

9-10 Aug Collected in the vicinity of Kamlak. The most productive colleting site was along the Katun River near its confluence with the Sema River.

11 Aug Traveled to a camping area at the 666 km marker on Hwy M-52. En route we went over 2 mountain passes, Seminsky (1700 meters, where the Soviet cross-country ski team trains) and Cheketeman (1250 meters). We camped along a small river, Ilgumen, more or less at the south base of Cheketeman Pass. We call this the Cheketeman Camp (960 meters).

12-13 Aug Collected on the south side of Cheketaman Pass and side canyons near out camp. This is a rich collecting area for Agropyron, Elymus, Psathyrostachys, and Pseudoroegneria.

14 Aug Traveled south to Ahtash (790 km from Novosibirsk) which is the closest we went to the Outer Mongolian border. Collected en route and returned to the Cheketeman Camp.

15 Aug Collected on the north side of Cheketeman Pass. An extremely productive collecting area.

16 Aug Collected in the vicinity of our camp and along the Katun River about 15 km south of our camp.

17 Aug Today we were scheduled to move to another camp. However, Dewey cut a 3-inch gash in his head and the move was delayed. Professional medical help was not available, but Kevin Jensen and Olga Agafonova applied the necessary first aid to stop the bleeding and prevent infection.

18 Aug Moved to a camp on a side road 37 km west of the village of Tuetka and about 20 km east of Yabagon Pass. We call this the Tuetka Camp. We are now on the route back to Novosibirsk.

19 Aug Collected in the vicinity of the Tuetka Camp, but with mediocre success.

20 Aug Returned to the Kamlak Station of the CSBG.

21-22 Aug Collected in the vicinity of the Kamlak Station, especially along the Katun River. It rained both days. The van driver, Yuri, broke his arm but he still insisted in driving. We traveled the next few days with a one-armed driver. Hectic!!

23 Aug Traveled to Troitskoe and spent the night with Olga Agafonova's parents.

24 Aug Returned to Novosibirsk (actually Academy Town).

25 Aug Traveled by bus to Novosibirsk and back to Academy Town. Made a collections of Agropyron cristatum in downtown Novosibirsk.

26-28 Aug Made about 100 collections from the seed stocks that Alex and Olga Agafonov had acquired from previous collection trips to various parts of the USSR. Made additional collections from Dr. Rosita Plennick's field plots at the CSBG. Packed our bags and seed in preparation for leaving.

29 Aug Flew from Novosibirsk to Moscow and spent the night in the hotel of the Academy of Science. The seed (426 envelopes) was put into three large heavy-duty paper sacks, which were put into one large duffel bag. We addressed the seed sacks to Dr. George White at Beltsville, MD and attached a yellow/green quarantine label to facilitate customs clearance in New York.

30 Aug Cleared Soviet customs with no hassle. We checked our luggage, including the seed through to Salt Lake City, but had to take it through customs in New York. The agricultural inspector at customs in New York was very cooperative. He mailed the seed to the quarantine station at Beltsville, MD; and they sent the seed on to us. The seed was back in our hands at Logan by 6 September in spite of the delay caused by the long Labor Day weekend.

After leaving the seed with the agricultural inspector in New York, we continued to Salt Lake City at 9:00 p.m. and to Logan by about 11:00 p.m., thus concluding an unusual but highly successful plant-collecting expedition.

KEY SOVIET COOPERATORS

Prof. Igor Y. Koropachinskiy, Director

Central Siberian Botanical Garden

USSR Academy of Science

101 Solotodolinskaya St.

Novosibirsk 90, USSR, 630090

Prof. Koropachinskiy issued the official invitation for us to participate in the expedition and gave approval for the logistical support. We did not meet Prof. Koropachinskiy because he was in the US during August.

Prof. Rosita Y. Plennick

Laboratory for Forage Plant Introduction

Central Siberian Botanical Garden

101 Solotodolinskaya St.

Novosibirsk 90, USSR, 630090

Prof. Plennick (a woman) is the Agafonovs laboratory chief. She is personally involved in collecting and describing legumes. We have asked Dr. M. D. Rumbaugh of our laboratory to correspond with Prof. Plennick.

Alexander and Olga Agafonov(a)

Laboratory for Forage Plant Introduction

Central Siberian Botanical Garden

101 Solotodolinskaya St.

Novosibirsk 90, USSR, 630090

The Agafonovs are our chief cooperators. They initiated our visit and must be given credit for the success of the expedition.

Ms. Helen Chernykh

Laboratory of Dendrology

Central Siberian Botanical Garden

101 Solotodolinskaya St.

Novosibirsk 90, USSR, 630090

Ms. Chernykh served both as an interpreter and our chief assistant in making collections. She was with us in the field daily and know what species are of most interest to us. She promised to collet Triticeae grasses for us during her field trip to the Soviet Far East in September 1989.