

**PLANT GERMPLASM COLLECTION REPORT**

**USDA-ARS  
FORAGE AND RANGE RESEARCH LABORATORY  
LOGAN, UTAH**

**Foreign Travel to:**

*Turkey*

**August 4 - September 6, 1979**

**U.S. Participants**

*James A. Hoffmann - Research Plant Pathologist (retired)*

*USDA-ARS*

*Logan, Utah U.S.A.*

*R. J. Metzger*

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*Corvallis, OR U.S.A.*

**GERMPLASM ACCESSIONS**

**Purpose of trip: (1) To collect seed of native wheats and wheat relatives in a search for new sources of resistance to the bunt fungi pathogenic on wheat; (2) To otherwise augment the existing germplasm pool of wheat and other cereal crops; (3) To collect seed of other native plant species, particularly of Gramineae, as expedient.**

**International Team Members:**

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## SUMMARY

Land races of wheat, wheat relatives, other cereals and Gramineae were collected in the eastern and southeastern provinces of Turkey. Collection was concentrated in provinces which had previously yielded useful bunt resistant germplasm and from which relatively few cereal collections had been obtained previously. Most of the areas explored were remote, mountainous, and agriculturally primitive. The expedition netted about 417 seed collections of Triticum , 98 Secale, 36 of Hordeum, 6 of Avenae, 128 of Aegilops, 35 of Agropyron and 40 of miscellaneous Gramineae and other plant families.

Bunt, smut, rust, and other diseases were present in most fields surveyed. Common bunt incidences ranged from at least a trace in nearly all fields to upwards of 80%. Dwarf bunt was frequently observed in fields at higher elevations. Rust (strip, leaf, and stem), though frequently present, did not appear to be occurring in epidemic proportions. Wheat cockle, caused by Anguina tritici, was also commonly observed and had seemingly gone unrecognized as a significant disease problem.

The Aegean Regional Agricultural Research Institute (ARARI) provided a four-wheel drive vehicle and the salaries of three Turkish team-members. All expenses were borne by the U.S. team.

## TRAVEL DETAILS

August 4-5 Travel from the U.S. to Ankara, Turkey.

August 6-7 In Ankara- Met with the Agricultural Attache, personnel of the Wheat Research and Training Institute, and toured the new Agricultural Research Center at Haymana. Upon being joined by the Turkish exploration team, we were informed that their expedition had been canceled because of insufficient funds and that the U.S. team would have to bear all expenses if the expedition was to be carried out. Consequently, the original itinerary was shortened and modified to accommodate available funds. Written approval from the Turkish Ministry of

Foreign Affairs had not been received, but it was decided that sufficient documentation was in hand to begin the expedition.

August 8 Ankara to Kayseri. Collected mostly Triticum boeoticum, Aegilops, Agropyron, and other Gramineae along roadsides and in protected areas.

August 9 Kayseri to Malatya. Collected Triticum boeoticum, T. durum, Secale, and Aegilops along roadsides and in cultivated fields and range areas. Common bunt in amounts up to a few percent was observed in fields of improved wheat varieties.

August 10 Malatya to Diyarbakir. Collected Triticum, Secale, Aegilops, and other Gramineae along roadsides and in range and protected areas. Stayed overnight and visited with personnel at the Regional Agricultural Research Institute near Diyarbakir and visited with Yasar Parlak, a bunt researcher at the Institute of Plant Protection in Diyarbakir.

August 11 Diyarbakir to Tatyvan. Collected Aegilops in a protected area near the Research Institute and Triticum aestivum and dwarf and semi-dwarf Secale cereale near Tatvan. Dwarf bunt was observed in trace amount in a field of "Dir" wheat near Tatvan.

August 12 North side of Van Lake and high county north and east of Van Lake. Collected Triticum aestivum, Secale, Hordeum, Agropyron, Dactylis, and Aegilops in fields and along roadsides. Traces of common bunt were found in most fields and one field had an incidence of up to 70%.

August 13 From Tatvan to Van and to Yuksekova. Collected Triticum aestivum along south shore of Van Lake, stopped in Van for vehicle repairs and supplies. Collected T. aestivum, Secale, Hordeum, Aegilops, Agropyron and other Gramineae in fields and along roadsides en

route to Yuksekova at elevations of 1700 to 2250 m. Common and dwarf bunt found in most fields in amounts up to 10%. Stayed in Highway Department facilities in Yuksekova.

August 14 Yuksekova to Semdinli and return to Yuksekova. Collected T. aestivum in fields and other Gramineae in range lands, oak forests and along roadsides. The road to Semdinli was steep and winding and four-wheel drive was used almost continuously. Road construction caused delays of more than an hour. This area is very remote and spectacularly beautiful with high mountains and deep, green valleys. Wheat collected near Semdinli appeared much like PI178383 which had been collected in this area by Harlan in 1957. Wheat cockle, caused by the nematode Anguina tritici was first observed in this area and was initially confused with dwarf bunt which has similar symptoms. Little or no bunt was observed on wheat in this area, although some was found on Agropyron and Aegilops.

August 15 Yuksekova and to Van. Collected T. aestivum, Aegilops, Secale and other Gramineae in fields and along roadsides. Rye was rare in this general area. Common and dwarf bunt was present in most wheat fields and amounts up to 20-30% were common. Bunt was observed frequently also on Aegilops and Agropyron. At one point we came within a few kilometers of the Iranian border.

August 16 Van and vicinity. Collected Triticum, Secale, and Aegilops within a short distance of Van. Treatment for Dr. Sencer, who had been stung on the eyelid by a bee several days before, was obtained. We swam and washed clothes in Van Lake and sorted and organized collections made previously.

August 17 Van to Ari. Collected mostly Aegilops along east and northeast shore of Van Lake and T. aestivum and Secale north to Ari. Found bunt on Aegilops and both common and dwarf bunt in low to moderate amounts on wheat.

August 18 Ari to Idir. Collected T. aestivum, S. cereale, Hordeum, Aegilops and Agropyron in fields, range areas, and along roadsides. Secale vavillovii was collected in areas adjacent to the west and north slopes of Mt. Ararat. Bunt was found in moderate amounts in most wheat fields

and up to 90% in one field. We stayed overnight and visited with personnel at the Agricultural Experiment Station near Idir.

August 19 Idir to Kars. Seed of T. aestivum and S. cereale was collected at a market in Tuzluca. Collections of T. aestivum, Secale, Aegilops, Hordeum and other Gramineae were made en route to Kars. We traveled near the Turkish-Russian border to Tuzluca and watch towers could be seen on the Russian side. Near Kars we traveled through beautiful coniferous forests interspersed with green meadows and fields. Bunt and cockle up to 15% were observed in some fields.

August 20 Kars and vicinity. Collected mostly Trifolium dicoccum, monococcum, and carthlicum from fields around Lake Cildir. We traveled through beautiful high elevation area extending to above 2000 m with timber, lush meadows and fields of barley, wheat, and grass hay. Bunt and cockle in amounts of 5-20% were common in wheat fields.

August 21 Kars to Artvin. Collected Triticum, Hordeum, Avena, and Secale from fields and other Gramineae from roadsides toward Gle. All fields had a great diversity of phenotypes, but all fields appeared much the same. We traveled north and west from Gle through high mountainous country reaching 2200 m and then down a narrow, deep canyon to Artvin and 230 m. Again, the scenery and diversity of flora were spectacular.

August 22 Artvin to Erzurum. Collected mostly Triticum and Secale near Tortum and Erzurum. We drove through another spectacular canyon (of the Coruh river) rising over 2000 m and then down again to the Erzurum Plain. Few of the roads we traveled could be negotiated with an ordinary passenger car.

August 23-25 Erzurum and vicinity. Visited the Regional Agricultural Experiment Station near Erzurum and toured the cereal breeding nurseries and bunt plots with Baydur Yilmaz. Collected Triticum and other cereals east of Erzurum toward Eleskirt. Most fields had already been cut so collecting was confined to bundles stacked in the fields. All of August 25 was spent at the Experiment Station sorting and organizing collections made previously.

August 26 Erzurum to Erzincan. Completed organization of collections at the Station at Erzurum and proceeded toward Erzincan. Collected Trigicum, Hordeum, and Secale in field north of Askali and from bundles in a threshing yard near Tercan. Common bunt found in trace amounts up to 10%.

August 27 Erzincan to Sivas. Collected seed of T. aestivum and T. durum in a market in Erzincan and in fields en route to Sivas. Bunt was found in trace amounts up to 5%. One field contained 40% cockle.

August 28 Sivas to Ankara. Collected seed of cultivars of wheat and rye in the market at Sivas and T. aestivum, Secale, Hordeum and Avena from harvested bundles in fields and a threshing area en route to Ankara.

August 29-30 At Wheat Research and Training Institute, Yenimahalle - Ankara. Consulted with personnel at the Institute and U.S. Embassy regarding the expedition and prepared collections for shipment to the U.S. On August 30 we drove to Kizilcahamam National Park north of Ankara and collected Aegilops along roadsides en route.

August 31 Ankara to Izmir. Completed packing of collections and traveled to Izmir collecting Aegilops and Agropyron along roadsides en route.

September 1-3 In Izmir and vicinity. Hotel accommodations were not available in Ixmire so we stayed in the guest facilities at the Olive Research Institute at Bornova. In view of the uncertainties of the expedition, advance reservations for our return flight had not been made and we could not obtain space on flights out of Turkey until September 4. Consequently, two days were spent in Ixmire visiting personnel and discussing programs at ARARI. On September 2, we visited the Museums at Efes and the ruins at Epheses, continuing on to Dilek Yarimadase National Park on the coast south of Izmir. Collections of Aegilops were made here and near

Kusadashi. On September 3, we visited the ARARI germplasm storage facilities at Menemen and drove north of Izmir making our last collections of Triticum (escapes), Hordeum and Aegilops on the Menemen Plain.

September 4 In Izmir and to Istanbul. Flight reservations from Izmir to Istanbul and then to London were finally obtained for that evening. We packed and then visited with Kasif Temiz, Director of ARARI, and Cevdet Dutlu, cereal pathologist. Arrangements were made to test some advanced breeding lines for bunt resistance at Logan the following Spring. We left Izmir and our good companions with considerable sadness late that evening.

September 5-6 Return to the U.S. via Istanbul, London, and to New York.

## **RECOMMENDATIONS**

1. Additional collecting in the same and other provinces of Turkey would undoubtedly yield additional useful cereal germplasm. Future expeditions should be of longer duration and the itinerary developed with greater cognizance of plant maturity varying with elevations and latitude.

2. Additional knowledge and instruction should be made available to germplasm collectors on how to sample material in the field to obtain the greatest genetic diversity. For example, how should collection sites be determined; how much material should be collected at each site; to what extent does phenotypic variation represent diversity for disease resistance and other unrecognizable attributes?

3. The objectives, procedures, and responsibilities of the participating individuals or groups should be discussed and clearly established prior to the expedition to avoid confusion and misunderstanding.
  
4. Application for permits required by the Turkish government should be submitted at least nine months prior to the anticipated initiation date. It may be expedient to submit a complete set of applications to each of the several ministries from which approval is required. Accept the fact that if anything can go wrong, it probably will!!
  
5. Carry sufficient funds, equipment, supplies, spare parts, etc. to take care of any contingencies or emergencies.
  
6. Collection of germplasm in Turkey without the company of persons familiar with the geography, language, and customs should not be attempted. The expedition should keep a 'low profile' at all times.
  
7. Record keeping becomes a time-consuming and often frustrating task, particularly when samples are broken down into sub-samples based morphologic characters. Simplification of this process, using a systematic approach and more appropriate forms would be desirable.

## GERMPLASM EXPEDITION

### TURKEY

## AUGUST 1979

### Number of Collections by Province

Province	Triticum aestivum	Triticum durum	Triticum spp. <sup>1/</sup>	Secale spp. <sup>2/</sup>	Hordeum spp. <sup>3/</sup>	Avena spp. <sup>4/</sup>	Aegilops spp. <sup>5/</sup>	Agropyron spp. <sup>6/</sup>	Dactylis glomerata	Misc. <sup>7/</sup> gramineae	Misc. <sup>8/</sup> spp.	TOTAL
Ankara			1		1		14	2				18
Kersehir			6	1			7	3				17
Nevsehir			1	1			2	3		1	1	9
Kayseri			5	8			2					15
Malatya		1	1	3			6					11
Elazig	3		3	3			13	2		1	4	29
Diyarbakir			2				9					11
Bitlis	29			16	1		1	1	1	1		50
Mus	5											5
Agri	28			13	1		3	4	2			51
Van	76			19	3		17	8	1	1		125
Hakkari	36			4			20	2	6	2	1	71
Kars	59	1	12	9	13	5	16	6	5	6	2	134
Erzurum	61		3	10	6		1	2	1	1		85
Gumushane	11			2	5				1			19
Erzincan	30	4		3	2							39
Sivas	27			3	1	1		1				33
Yozgat	7	1		2			1					11
Afyon							2	1				3
Aydin					1		10			2		13
Izmir	3		1	1	2		1					8
TOTAL	375	7	35	98	36	6	125	35	17	15	8	757

1/ Includes boeoticu, carthlicum, dicoccoides, dicoccum, monococcum, and unidentified.

2/ Includes anatolicum ancestrale, cereale, kuprijanovii, montanum, segetale, vavillovii, and unidentified.

3/ Includes bulbosum, distichon, vulgare, and unidentified.

4/ Includes sativa and unidentified.

5/ Includes biuncialis, columnaris, comosa, cylindrica, longissima, mutica, ovata, speltoides, squarrosa, triarisata, triuncialis, umbellata, variabilis, and unidentified.

6/ Includes cristatum, desertorum, elongatum, repens, and unidentified.

7/ Includes Alopecurus spp., Briza spp., Bromus spp., Festuca spp., Lolium rigidum, Poa spp., and unidentified.

8/ Includes *Astragalus* spp., *Cdphalaria syriaca*, *Dianthus* spp., *Ornithogalum* spp., *Puccinellia* spp., *Sanguisorba* spp., *Trifolium pratense*, *Tulipa* spp., and *Vicia* spp.