

Two sets each of the Chickpea International Yield Trial (CIYT) and the Chickpea International Screening Nursery (CISN) were evaluated during 1989-91. Sixteen promising lines (FLIPs 84-18C, 85-75C, 85-4C, 85-13C, 86-11C, 85-54C, 84-17C, 86-41C, 88-18C, 88-45C, 88-68C, 85-116C, 85-47C, 84-33C, 81-239C, and 89-113C) were selected for further evaluation in both Xining and Gansu areas. All lines matured in time in Xining area. They showed moderate resistance to ascochyta blight and have large seeds.

Future Prospects

Chinese scientists have started research on chickpea only recently, hence much remains to be done. For example, the problems of poor seedling emergence at low temperatures, and poor nodulation and N-fixation when the crop is grown in new areas need to be addressed. Processing and utilization problems also need attention.

Based on the studies conducted by scientists at Qinghai and Zhangye, chickpea can be profitably cultivated in all the provinces of northwestern China, and in a few provinces of northern China such as Shanxi, Leimongu, and Hebei. In areas with annual precipitation of only 300-500 mm, chickpea can be grown where the temperature regime and rainfall patterns are suitable. In areas with <200 mm rainfall, chickpea can be grown with irrigation. In the above mentioned dry and semi-arid areas, pea and lentil are sown as break-crops for wheat and barley. But, yields of pea and lentil are low and unstable (750-1500 kg ha⁻¹). Chickpea is expected to yield around 1500-2000 kg ha⁻¹. In addition, chickpea can be remunerative as a winter crop in Hainang and Yunnan provinces.



Dr C.L.L. Gowda, Coordinator, Cereals and Legumes Asia Network, ICRISAT Center on a visit to Qinghai Academy of Agriculture and Forestry chickpea farm in China with Ms Feng Qing Hua, Legume Breeder.

Chickpea in Uzbekistan, CIS

M.P. Haware and Jagdish Kumar (ICRISAT Center)

In June 1991 when we visited Uzbekistan it was part of USSR. It is now a member of the Commonwealth of Independent States (CIS). Uzbekistan is situated in Central Asia between latitudes 41° and 43°N and between longitudes 60 and 70° E at a mean altitude of 450 m. The average rainfall is 350 mm. The most important crops are cotton, wheat, and corn. Sheep breeding and silk rearing are two other important agriculture-related activities. Chickpea has been grown as a drought-resistant and high protein crop since ancient times and currently over 10 000 ha are cultivated. Sowing is done in March-April and depending on rainfall the crop is harvested in June-July.

We visited the Central Asian Branch of the All Union Plant Growing Institute, (SAFVIR), Tashkent, on 15 Jun 1991. This institute has over 2 200 chickpea germplasm lines obtained from various parts of the world including CIS, India, Iran, Iraq, Israel, and Turkey.

Most of the chickpea lines are of the kabuli type. At the time of our visit, about 400 germplasm lines were being grown of which a few were desi types. The crop had been sown on 28 March and was in the flowering/podding stage. The crop growth was good, however, we observed fusarium wilt, leaf miner, stunt, and some white grub damage in the crop.



Dr K. Eshmirzaev, (second from left) Director, Uzbek Grain Crops Research Institute, Galliaaral, Uzbekistan, CIS, with his colleagues in a chickpea field at Galliaaral looking at ICRISAT chickpea trials with ICRISAT scientists Dr Jagdish Kumar (third from left), and Dr M.P. Haware (fourth from left).

We also visited the Uzbek Grain Crops Research Institute at Galliaaral, Uzbekistan on 17-18 Jun 1991. We were received by Dr K. Eshmirzaev, Director and Chickpea Breeder, and Mr Amanov Amir, Secretary for Science who is a Pathologist.

The main station of the Institute has a 1 200 ha farm. About 60 ha were sown to chickpea for seed multiplication.

The soils at the Institute are typical Cerezoms, loamy in texture, low in humus (0.8-1.2), pH 7, average P_{2O_5} , and high K_2O . Rhizobium is not applied to the soil.

The irrigated crop, sown at 70 cm spacing, was tall (about 60 cm). It was reported that Yuldus (star), a kabuli variety released in 1980, produced up to 2 400 kg ha⁻¹ with two irrigations. It is susceptible to ascochyta blight (AB).

In breeding trials (3 rows, 13 m long, 3 reps), we observed sporadic incidence of fusarium wilt and leaf miner. No other constraint was visible. Plant stands were good. Promising lines were: Yuldus, M 6, Uzbekistan (resistant to AB), Grodno (desi for feed), ICCV 5 (somewhat late), ICCV 6, ICC 42, and C 235.

The rainfed trials were sown at 50 cm spacing and showed drought stress symptoms. A trial of 12 germ-

plasm and breeding lines revealed that Zur, Lazzat, nos. 5055, and 2956 were early maturing and had good podding. In another trial of 14 lines, nos. 5355 and 5293 were promising.

In the breeding nursery (700 lines - generations not known), nos. 3444, 4900, 6178, and 6062 were promising.

In the germplasm nursery of 120 entries, only K 243 was promising under both irrigated and rainfed situations.

We saw relatively few segregating populations, and upon enquiry were told that only about 10 crosses are made every year. Even among the segregating lines there appeared to be very little variation.

Large chickpea fields were visited in the Bakhmal area where the temperature was low and the soil was a sandy loam.

In general, chickpea fields were well managed. Leaf miner was observed in most fields visited. Fusarium wilt and stunt diseases were observed. Ascochyta blight may become a serious problem in the country if the environment is favorable to the disease in April-May. All the chickpea grown in Uzbekistan was of the kabuli type with an average seed mass of 25-30 gm 100 seed⁻¹. Previ-

ously farmers cultivated chickpea in small plots and it was harvested by hand, but in recent times the crop has been cultivated in large fields and combine harvested.

The farmers need a tall variety which gives good yield with minimum pod loss at harvest. According to Dr Eshmirzaev, most important priorities for research are selecting chickpeas for frost and ascochyta blight resistance and high protein content.

Second Survey of Chickpea Diseases in Myanmar

Aung Baw, May May Khin, and Maung Maung Tin (Plant Protection Section, Myanma Agriculture Service, Myanmar)

Chickpea is an important grain legume crop in Myanmar where it is cultivated on 200 000 ha. Dry root rot (*Rhizoctonia bataticola*) and fusarium wilt (*Fusarium oxysporum* f.sp. *ciceri*) were found to be the major diseases. The first systematic survey of chickpea disease was carried out in Mandalay, Sagaing, and Bago divisions in 1990 according to a cooperative work plan of the Asian Grain Legumes Network (AGLN), ICRISAT and Myanma Agriculture Service (MAS) (Reddy *et al.* 1991). Magway division was not included in the first disease survey. The second survey was conducted during 16-23

Feb 1992 in Mandalay, Sagaing, Magway, and Bago divisions. Thirty locations in nine townships were surveyed. These included farmers' fields, a research farm, and two seed farms. Three random plots of 1 m² in each field were taken and the incidences of all diseases except fusarium wilt were recorded. Wilt incidence was visually estimated in the plots. The average disease incidence for the locations was calculated from these observations.

Fusarium wilt and dry root rot diseases were observed in all the four divisions surveyed (Table 1). Fusarium wilt incidence ranged from 0 to 50% and dry root rot from 0 to 10%. Dry root rot was prevalent everywhere but fusarium wilt was confined to specific areas as was found in the first survey. High incidence of fusarium wilt (50%) was found mainly in the cv Yezin 1 (P 436). Incidence of wilt (up to 5%) was observed in cv Karachi in Bago division. Fusarium wilt incidence of up to 25% was found in Sagaing division where chickpea fields noted to be heavily infected in 1990 were rotated with other crops such as wheat and/or the wilt resistant chickpea cv Karachi. Occurrence of stunt and phyllody diseases was sporadic.

Reference

Reddy, M.V., Aung Baw, U., Moe Hein, U., Kyaw Moe, U., Thein Su, U., and Sethi, S.C. 1991. Survey of chickpea diseases in Myanmar. International Chickpea Newsletter 24:46-47.

Table 1. Chickpea disease survey in four divisions of Myanmar, 16-23 Feb 1992.

Division	Township (Nos.)	Location (Nos.)	Total field area (acre)	Disease incidence (%)				
				Fusarium wilt	Dry root rot	Stunt	Phyllody	Total
Mandalay	1	2	4.00	0.008 (0-0.03) ¹	0.003 (0-0.01)	0.03 (0-0.06)	0.003 (0-0.003)	0.044
Sagaing	3	9	15.75	1.65 (0-25)	2.23 (0.01-10)	0	0	3.88
Magway	4	15	20.25	2.37 (0-50)	1.14 (0.01-6)	0	0	3.51
Bago	1	4	15.55	0.66 (0.3-5)	0.32 (0-3)	0	0	0.98
Mean disease incidence (%)				1.01	1.12	0.001	0.0001	2.131

1. Figures in parentheses indicate the range of disease incidence in different fields sampled.