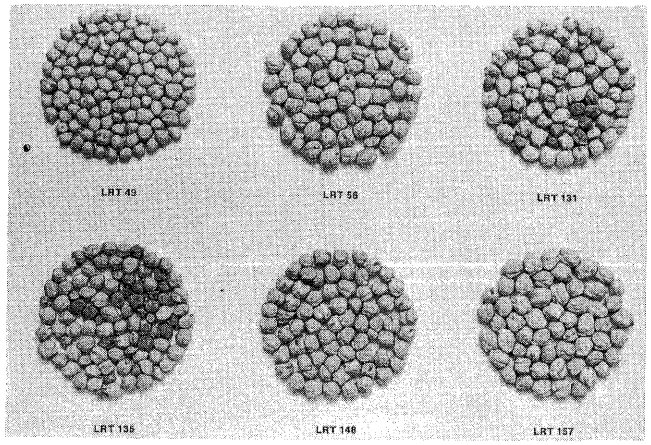

Figure 2a. Variability of seeds within and between the samples of chickpea landraces collected in Morocco.

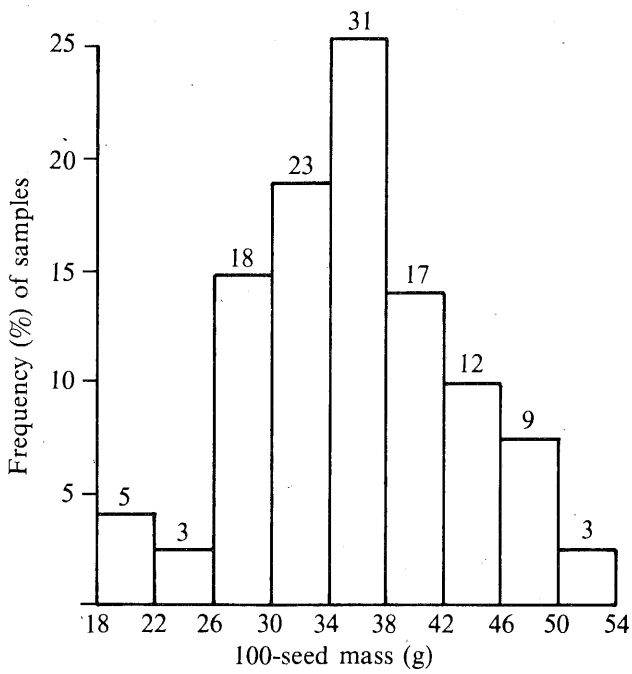

Figure 2b. Seed size variation between the chickpea seed samples collected in Morocco. Values on top of the bars indicate number of samples.

Reference

FAO (Food and Agriculture Organization). 1974-85. FAO Production Year Book, Vols. 28-39. Rome, Italy: FAO.

Collection of Germplasm of Chickpea Landraces in Madhya Pradesh, India

R.P.S. Pundir,[1] S.W. Telang,[2] Jagdish Singh,[3] and **Bhag Singh[4]** (1. ICRISAT Center; 2. Jawaharlal Nehru Krishi Vishwa Vidyalaya Campus (JNKVV), Indore; 3. JNKVV Campus, Sehore; 4. National Bureau of Plant Genetic Resources, New Delhi)

Chickpea ranks first among pulses and ranks third among all food crops grown in Madhya Pradesh (M.P.), India. During 1985, this crop was cultivated on 2.07 million ha, which is about 20% of the world chickpea area. The state being large, with varied agroecological conditions, many diverse types of chickpea are known to exist there. At ICRISAT, efforts were made to assemble all chickpea germplasm available, in collaboration with different national and international institutes, which resulted in 251 accessions of M.P. origin. However, the majority of these lacked full passport information. Also, considering the large area under chickpea, the number of accessions was low. Therefore, high priority was accorded to systematic collection of chickpea landraces in M.P.

The work was accomplished in two missions, 5-20 Mar 1986, and 6-21 Mar 1987. The missions were jointly conducted by ICRISAT; Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur; and the National Bureau of Plant Genetic Resources, New Delhi. The route followed during the mission is shown in Figure 1. The mission times coincided well with the maturity of the chickpea crop, and we were able to obtain germplasm samples from crops in the fields. Samples were taken by picking a few pods from each of about 100 plants chosen randomly at each site. Whenever we found unique plant or plants with many desirable characteristics; e.g., large pods or large number of pods, we kept seed from such plants separately, as selective samples. The two missions resulted in the collection of 351 samples of chickpea, which were shared among the collaborating institutes.

The state of M.P. lies between 17°48' and 26°52'N latitude. Soils are mostly black loam or clay, but alluvial sandy soils are found towards the north of the state. In general, the altitude varies from 200 to 500 m. Average annual rainfall is about 1000 mm, most of it falling between June and September. These features provide three distinct seasons: the rainy season, winter, and summer.

In the majority of the fields, chickpea was sown as a sole crop. However, in some cases it was mixed with linseed, brassica (*sarson*) or wheat. Seed is generally broadcast in the field, with a moderate level of tillage. In most cases, chickpea is sown in October, after the rains recede, and the crop is harvested from February to April; i.e., in about 110 to 140 days in different regions. Whenever feasible, the crop is

irrigated, and large-seeded desi and kabuli types are preferred. In general, we noticed good agronomic performance of the crop. Pod-borer damage was minimal, and diseases were also not serious. However, sometimes the damage caused by collar rot (*Sclerotium rolfsii*), fusarium wilt, and alternaria blight

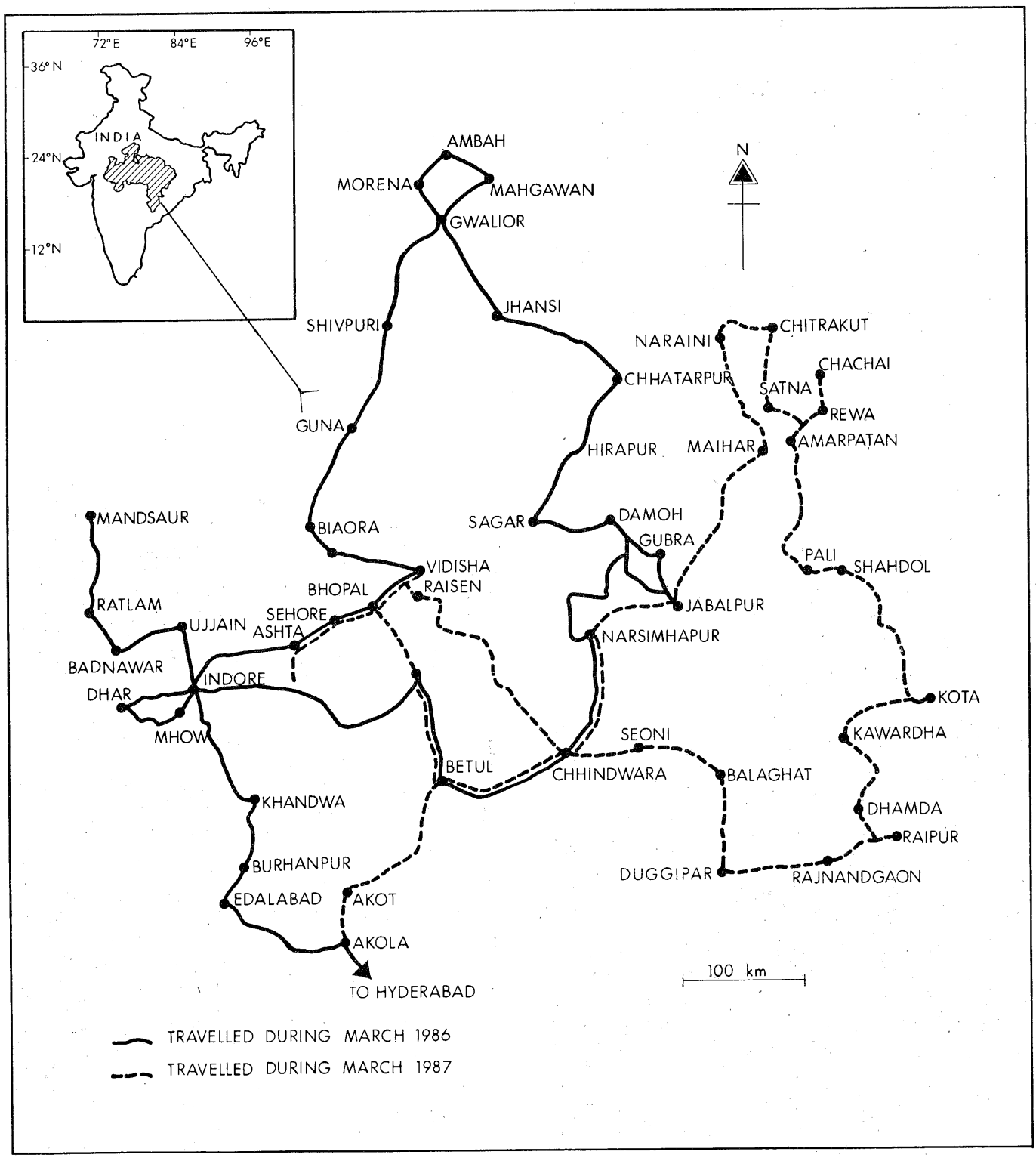

Figure 1. Route followed during chickpea germplasm collection missions in Madhya Pradesh, India, 1986 and 1987.

was conspicuous. Occasionally, excessive vegetative growth, which would lead to yield loss, was also seen.

Chickpea grown in M.P. shows a wide range of variability; all seed types--typical desi, pink-seeded (desi-kabuli intermediate), tuberculated (seed coat with minute tuberculation), large-seeded desi, and kabuli types--are cultivated and there is a demand for all types. Twin-podded types, distinct from the usual single-podded type, were seen in many fields (Fig. 2a). Considerable variation for 100-seed mass was observed; in the seed samples collected, it ranged from 7.0 g to 39.1 g, with a mean of 15.94 g. However, in the majority of the samples, the 100-seed mass ranged between 13 and 17 g (Fig. 2b). Variation for leaf size, plant height, and growth habit was also observed. The extent of these variations was greater between than within fields. The crop duration was short (about 110 days) in the southern part of the state and medium (about 140 days) in the northern part.

The largest proportion of the chickpea harvest in M.P. is converted into decorticated cotyledon splits

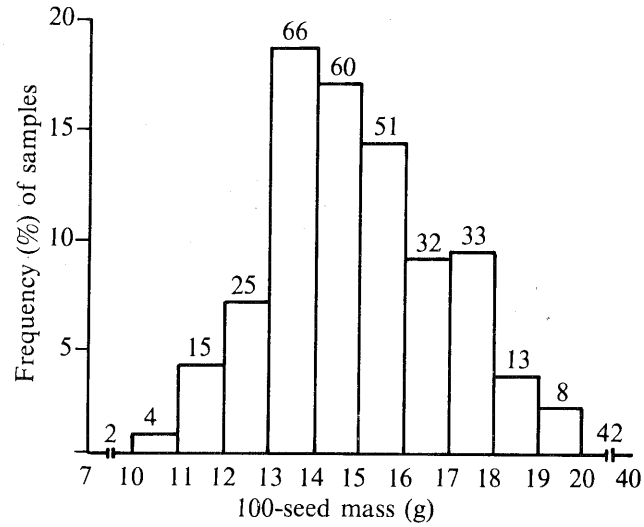

Figure 2b. Spectrum of chickpea seed size variability among the samples collected in Madhya Pradesh. Values on top of the bars indicate number of samples.

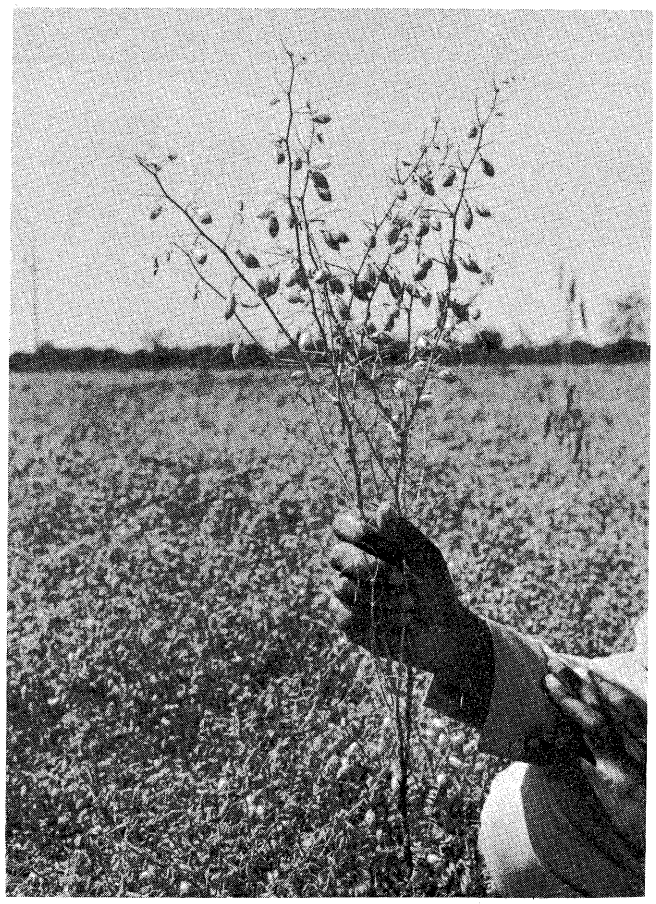

Figure 2a. Twin-podded chickpea types collected in Madhya Pradesh, India.

(dhal), which can be powdered to *besan* (chickpea flour), which is used to prepare several sweet and salty snacks. Dhal is also cooked as such and forms an important part of regular meals. Chickpea is often used after frying (parching) in M.P., and the pink-seeded type is most preferred for this preparation. Though in the past, wheat and chickpea flour were used in equal proportions to make unleavened bread, the proportion of chickpea, now, is being progressively reduced because of its high price. Chickpea is also consumed as whole seed cooked and spiced (Chhole) or uncooked (sprouted seeds with salt, lemon, and onion).

The collected samples are being characterized and tested for resistance to various biotic and abiotic stresses. Seed of any sample can be obtained for research use from the Genetic Resources Unit, ICRISAT.

The research needs for chickpea in M.P. are varied. Crop duration differs from short to medium. Breeding lines developed for this region should have resistance to fusarium wilt, dry root rot, collar rot, and alternaria blight diseases. Tolerance to pod borer would be desirable. Lines should be resistant to lodging; above all, they should have high seed-yield potential to be able to compete with other crops.

Reference

India: Directorate of Economics and Statistics. 1985. All-India second estimate of gram, 1984-85. Agricultural Situation in India 40(5):501.