Course in Chickpea Pathology

A group of 8 trainees from India and Egypt successfully completed the Second International Chickpea Pathology Course of 3 weeks duration. The participants were M.Sc/Ph.D degree holders. They were exposed to the techniques for diagnosing diseases as well as for resistance screening. Lectures/laboratory exercises in related disciplines, including breeding, genetic resources, entomology, and microbiology were arranged. Regular discussion sessions were held in the afternoons. So far 18 trainees from five countries have completed chickpea pathology training at ICRISAT. The next course will be organized in January 1981. Persons interested in this course or any other aspects of chickpea improvement training can obtain details and application forms from the Training Officer, ICRISAT.

Announcing the International Pigeonpea Newsletter

ICRISAT intends to issue a newsletter devoted to pigeonpea (*Cajanus cajan*) improvement research. This newsletter will probably appear annually and we hope to mail the first issue in December 1980. We know that many chickpea scientists also have a major interest in pigeonpea and ask that all such people should write to us so that we can include their names, specialities, and addresses in the first issue. Single copies will be sent free to libraries, cooperators and to all those who ask to go on our mailing list.

We would also welcome short articles and news for inclusion in the first issue of the newsletter; requirements for style and form will be the same as for International Chickpea Newsletter (see p.21). The deadline for the first issue contributions will be mid-October 1980.

Research Reports

Genetic Resources

Growing Wild Chickpeas

The germplasm bank collection of any crop is incomplete without its wild relatives. Using modern techniques we are able to obtain fertile crosses between species and introduce greater genetic diversity into our breeding lines. At ICRISAT we pay special attention to the collection and maintenance of the wild *Cicer* spp. We have succeeded in collecting all the nine extant annual species and in rejuvenating seven of them at our Center. However, we have not yet succeeded in maintaining any of the perennial *Cicer* spp, for all of them died before the fruiting stage, presumably because of the hot weather.

An attempt was made to establish perennial species of *Cicer* at Gondla, Lahual Valley, India, and seeds were supplied for a wild-flora garden at Kabul, Afghanistan. Both attempts appeared abortive, although wild chickpeas do occur in the vicinity of both these locations. In Ankara, Turkey, some success was achieved when *C. montbretii* from the Turkish Aegean Coast was established, but only after the seeds had been in the soil for several years. Even then, flowering did not result in fruiting.

The hot weather at ICRISAT Center poses problems for us in the maintenance of the annuals, for most of them fail to complete their life cycles in the relatively short, cool season and high temperatures kill the plants. It is relatively easy to maintain these species further north at Delhi where the cool season is longer, but even there difficulties and failures are reported. We receive many requests for seeds of the wild species and fill them wherever possible. Many cooperators, however, find that they cannot grow the wild species successfully and often ask for more seed and guidance on growing it. Our experience in maintaining the wild *Cicer* spp under difficult conditions may be of interest and use to those who wish to embark on attempts to grow these species and cross them into chickpea. The following tips might prove helpful in growing wild *Cicer* spp in environments which have a cool season at least as long as that at ICRISAT Center. For the perennial species a temperate climate is required.

1. Sow wild *Cicer* spp as early in the season as possible. This will provide better chances of obtaining the seed. Sow chickpea repeatedly to synchronize its flowering with the wild species.

2. The seeds should be carefully scarified to advance germination. This can be done by incising the seed coat, carefully avoiding the area of the hilum and

embryo. The seeds can be germinated in small pots, and then transplanted carefully.

3. The soil should be well-aerated, not too wet, of pH 7 - 8.5, containing more well-rotted farmyard manure (FYM) than is generally available in nature. A proportion of 3 parts of soil to 1 part of FYM works well.

4. Watering should be very carefully done in either pots or field, so that the plants are not wetted. Dug-in pots are a good proposition.

5. It is useful to place pebbles on top of the pot soil to keep the branches away from the soil.

6. We have not yet experimented with shade, but despite the high insolation origin of most species, shade might prolong the life cycle, where hot weather is encountered.

7. Hot weather and wet seasons should be bridged by placing *Cicer* in cooled greenhouses.

Cicer judaicum and *C. cuneatum* are easy to grow; *C. bijugum, C. pinnatifidum, C. reticulatum,* and *C. chorassanicum* pose more problems, while *C. yamashitae* and *C. echinospermum* have to be pampered. Until now only *C. reticulatum* has produced fertile hybrids with *C. arietinum* as the female parent. Other crosses have failed, or the seeds obtained produced sterile offspring. Better results can be expected under controlled environments, although crossing barriers are formidable.

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Variability for Seed Size and Seeds per Pod in the Kabuli Chickpea Germplasm

Seed size and seeds per pod are two important characteristics considered in chickpea improvement research. Large-seeded types fetch higher prices both in domestic and foreign markets. It has been observed that more seeds per pod is frequently associated with higher yields. During 1979, the kabuli germplasm maintained at ICARDA was evaluated to determine the range of variability for these two traits.

Over 3000 kabuli germplasm accessions were grown in two rows each, during the 1979 spring season. The rows were spaced 32.5 cm apart, and each row was 4m long. The 100-seed weight of randomly picked seeds from each entry was recorded to the nearest gram. Observations were recorded on ten randomly chosen pods from each line to determine the mean number of seeds per pod. Whenever the number of seeds per pod exceeded two, data of total number of seeds and pods per plant were collected from five plants. Seeds per pod was then determined by dividing the total number of seeds per plant by the number of pods per plant.

The 100-seed weight ranged from 8.2 to 65.5 g, suggesting the existence of a wide variability for this trait. The 100-seed weight in three lines was more than 60 g, in 32 lines between 51 and 60 g, and in 206 lines between 41 and 50 g (Table 1). At the other extreme, there were 11 lines with less than 10 g/100-seed weight. The majority of the accessions had a seed weight between 11 and 30 g/100-seed, the mean being 26.7 g/100-seed. Most of the large-seeded types originated from Spain and USA, probably due to the consumers' preference in those countries.

Table 1. Classification of kabuli germplasm lines from the ICARDA collection for 100-seed weight (g) and number of seeds per pod.

100-seed wt (class)	No. of lines	Seeds/pod (class)	No. of lines
< - 10	11	< - 1.0	534
11 - 20	1062	1.1 - 1.4	1520
21 - 30	1180	1.5 - 1.8	906
31 - 40	582	1.9 - 2.2	181
41 - 50	206	2.3 - 2.6	39
51 - 60	32	2.7 - 3.0	8
> 60	3		
Total	3076		3188

Mean seeds per pod varied from 0.9 to 3.0. This indicated that a wide variability