material is at F_2 and F_3 stages and from then on it rapidly reduces.

This system will be well adapted to supplying useful material from ICRISAT to other Centers. For example, after identification of best F_3 progenies, F_4 families could go into the International Chickpea Screening Nursery, which would also provide segregating material for further selection.

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Variation in the proportion of double-podded nodes among advanced-generation progenies in chickpea--some preliminary observations

Physiological studies conducted at ICRISAT Center (Sheldrake et al. 1978) have shown that grain yield in chickpea are up to 11% higher in double-podded (two pods/pedicel at least at one fruiting node) than in conventional single-podded genotypes, particularly under stress of environmental conditions. Further studies at ICRISAT Center and elsewhere have shown that the double-podded characteristic is under the control of a single recessive gene; so the characteristic can easily be incorporated into the breeding material. But its expressivity is low. All fruiting nodes in double-podded genotypes are not double-podded and this proportion varies from genotype to genotype. A higher proportion of double-podded nodes may be more desirable in a genotype since it may add to the increase and stability in seed yield. The present study investigates the extent of proportion of double-podded nodes among advanced-generation, double-podded progenies of chickpea.

Forty-three F_7, 184 F_6, and 247 F_5 progenies, derived from crosses between double-podded and multiseeded (single-podded) lines, were grown in field at ICRISAT Center in 1984/85 in unreplicated plots of two rows, spaced 60-cm apart, with plants at 20 cm. These were evaluated for the expressivity of the double-podded characteristic at the time of maturity. For this, 10 random plants were chosen in each plot and the numbers of total fruiting nodes and of those bearing two pods per pedicel on the main stem of each plant were counted. The proportion of double-podded nodes in each plant was then estimated as percent of the total fruiting nodes (this simple procedure was adopted after it was found that the estimates thus obtained were well correlated with those obtained by counting all the fruiting nodes and double-podded nodes on a plant). The means and their standard errors for each progeny were calculated using the data from all 10 plants in a progeny. No transformation of data was carried out since there were no extreme values in the data set.

The estimates of the percentage of double-podded nodes of five progenies with the highest and one progeny with the lowest proportion each in the F_5, F_6, and F_7 generation are presented in Table 1. The percentage of double-podded nodes varied from 28.5% to 80.2% in F_5; 29% to 83.2% in F_6; and 33.6% to 77.6% in F_7 generation. In a separate experiment at ICRISAT Center the same year, the double-podded variety JG 62 produced about 50% double-podded nodes. Several lines, such as ICCX-790173-BH-BP-28P-1P (F_6 generation), produced significantly higher proportions of double-podded nodes than others and may be used as better sources of the double-podded characteristic in breeding programs.

These are only preliminary observations and the selected progenies/lines with highest and lowest proportions of double-podded nodes will be further evaluated in a replicated test in 1985/86.

Table 1. Percentage estimates of double-podded nodes and their standard errors in some selected advanced-generation progenies of chickpea at ICRISAT Center, 1984/85.

Pedigree	Parentage	Percentage double-podded nodes (%)	SE±
F_5 generation			
ICCX-790166-17P-1P-1P	P 272 x HMS 30	80.2	18.87
ICCX-790165-2P-1P-1P	P 272 x HMS 28	76.6	14.44
ICCX-790181-4P-1P-1P	Pant G 120 x HMS 28	75.7	12.12
ICCX-790167-5P-1P-1P	P 502 x HMS 4	61.2	15.99
ICCX-790161-5P-1P-2P	P 272 x HMS 13	61.1	13.78
ICCX-800469-13P-1P-2P	HMS 13 x JG 62	28.5	16.68
F_6 generation			
ICCX-790173-BH-BP-28P-1P	P 502 x HMS 28	83.2	15.96
ICCX-790172-BH-BP-12P-BP	P 502 x HMS 23	80.0	15.96
ICCX-780323-26P-BP-2P-BP	JG 62 x HMS 2	77.3	10.41
ICCX-790164-BH-BP-22P-1P	P 272 x HMS 23	76.2	16.14
ICCX-790164-BH-BP-38P-1P	P 272 x HMS 23	73.6	15.65
ICCX-780325-6P-BP-1P-1P	JG 62 x HMS 4	29.0	16.36
F_7 generation			
ICCX-780397-9P-BP-1P-1P-1P	JG 74 x (JG 62 x P 345-1)	77.6	26.16
ICCX-780397-9P-BP-2P-1P-1P	JG 74 x (JG 62 x P 345-1)	72.5	8.64
ICCX-780362-3P-BH-1P-1P-1P	JG 62 x HMS 18	68.2	15.24
ICCX-780329-24P-BH-1P-1P-2P	JG 62 x HMS 8	67.4	13.24
ICCX-780362-12P-BH-1P-1P-2P	JG 62 x HMS 18	62.9	16.66
ICCX-780361-8P-BH-1P-1P-1P	Pant G 120 x HMS 18	33.6	14.90

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Genetics of nonnodulation in chickpea

Genetics of nonnodulation in chickpea was first reported by Davis et al. in 1986. At ICRISAT Center, a nonnodulation spontaneous mutant was identified from chickpea genotype ICC 435 (Rupela and Sudarshana 1986), which was named ICC 435M. An attempt is being made to determine the genetic nature of the