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at the garden. Generally merchants buy from gardeners and export, but a few gardeners directly export the fruits to Madras and sell them wholesale or in retail.

Cost of Cultivation per acre.

	Rs.	A.	P.
<i>Preparatory cultivation</i> ;—			
Digging pits :—Three feet cube 18 ft apart 135 pits at 0-1-0 per pit.	8	7	0
<i>Manuring and Manures</i> :—			
Green leaf or cattle manure @ 0-3-0 per tree including application.	25	5	0
<i>Seed and sowing</i> :—			
Three year old seedlings @ the rate of Rs. 50 per 100 including labour for planting	68	8	0
<i>After cultivation</i> :—			
Digging round plants by mamutti up to a distance of 3' four times—10 men @ 0-4 -0 each	10	0	0
Trenching round each plant @ 0-0-3 per plant per year	2	1	0
<i>Irrigation</i> :—			
Irrigation once in 4 days from February to August (8×7=56) @ Rs. 1-8-0 per irrigation	84	0	0

Assuming the life of a garden to be 45 years.

Cost of cultivation per year.

<i>Preparatory cultivation</i> (proportionate cost)	0	3	0
<i>Manures and manuring</i>	25	5	0
<i>Seed and sowing</i> (proportionate cost)	1	8	0
<i>After cultivation</i>	12	1	0
<i>Irrigation</i>	84	0	0
<i>Watchmen</i> @ Rs. 3-0-0 per 4 months	12	0	0
<i>Average assessment</i>	10	0	0
Total	145	1	0

Yield :—

150 fruits per tree on an average @ Rs. 3-0-0 per 100 for 135 trees.	607	8	0
Deduct cost of cultivation	145	1	0
Net profit per acre per annum	462	7	0
or Rs.	460	0	0

The writer acknowledges with thanks the suggestions given by Mr. M. Kanti Raj, Assistant Director of Agriculture, Vellore in preparing this article.

THE FIRST GENERATION OF AN INTERSPECIFIC CROSS IN SOLANUMS, BETWEEN SOLANUM MELONGENA AND S. XANTHOCARPUM

BY Ch. V. SARVAYYA B. Sc., (Ag.),

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Towards the creation of 'larger' variations interspecific hybridisation is often resorted to. The use of wild forms in breeding crop plants, particularly to obtain vigour and resistance to diseases, has come to be well recognised. The present note deals with such a cross in *Solanum* species.

Reciprocal crosses between *S. melongena* and *S. xanthocarpum* were made in the winter of 1934—35 at the Agricultural Research Station, Maruteru. The flower buds were emasculated the previous evening, and crossing effected on the succeeding day when the bud would bloom. The buds after emasculation were enclosed in small muslin covers tightly secured to the peduncle. Crosses with the *S. xanthocarpum* as the pistillate parent were successful, while the reciprocal cross was a failure. As the flowering of the *S. melongena* parent at that time had almost drawn to an end it was then presumed that the late season flowers might be lacking in vigour to set seed. This feature is, however, being investigated. The crosses and the parent seed were sown in well prepared beds on 17—7—1935, and the seedlings transplanted on 6—9—1935.

Characters of Parents. While the detailed botanical description of the parents is reserved for a later publication some of the chief characteristics are mentioned here.

Solanum xanthocarpum, Schrad and Wendl. The plant is a conspicuous herb common in black cotton soils. It has a deep-seated, elaborately branched woody root system, sometimes attaining a length of even three feet. The numerous long greenish yellow spines all over the plant make it very prominent. The stem is somewhat round and covered with sparsely distributed stellate hairs and spreads on the ground. The leaves are simple alternate and pinnately lobed. Secondary lobing from primary lobes is a definite characteristic of this parent. The flowers are rather showy and purplish blue in colour. The flowers are dimorphic with respect to the length of style—long-styled and short-styled flowers. Invariably the two bottom flowers are long-styled ones, while the top ones are short-styled. The plant is highly medicinal and forms one of the '*Dasa mulikas*' of the Ayurvedic medicine. It is largely used in mixtures for colds, coughs, and chronic asthma. The researches in indigenous drugs taken up by the Bengal School of Medicine have confirmed its high place in the medical field.

Solanum melongena—(Brinjal). "This species is an annual erect branching herb, finally becoming subwoody, wooly or scurfy and spiny". The root system is composed of a long tap root with a crown of secondary roots spread in the superficial layers of the soil. Branches are spreading and zig zag due to the sympodial nature of growth. The leaves are simple alternate, sinuately lobed, ovate or ovate-oblong, thick, densely felted stellate hairs. Inflorescence is cymose, extra-axillary, cymes consisting of 4 to 6 flowers. The inflorescence is occasionally represented by solitary flower. Flowers are big, light purple in colour. The flowers are dimorphic with respect to length of style as in the other parent. The solitary i. e., the flower attached in the

bottom of cyme is long styled and the rest are short styled. Tender fruits of this species commonly used as vegetable needs no mention.

Description of the Hybrid. The hybrid is very vigorous, quick growing and spreading. The development of the root system is very interesting. In the seedling stage, the long tap root system with comparatively fewer secondaries resembling that of the *melongena* parent is evident, while in the later stages, an extremely elaborate secondary root system similar to that of the *xanthocarpum* parent appears to develop. Thus the F_1 has the root system of both the parents. The production of the secondary root system however, commences at a later stage than in the *S. xanthocarpum* parent.

The shoot is profusely branched, spreading and prostrate on the ground, studded with thick sharp spines rather more sparsely distributed than in the *S. xanthocarpum* parent. The shoot is sympodial in growth. The stem is round and covered with stellate hairs, whose density of distribution is intermediate between the two parents, *S. melongena* being the denser of the two.

Leaves are simple alternate, pinnately lobed, depth of lobing being intermediate between that of the two parents, deeper lobing being found in the *S. xanthocarpum* parent. Evidences of secondary lobing as in the *S. xanthocarpum* parent are also to be found. The leaf measurements along with the depth of lobing as measured by the perpendicular distance from the midrib to the bottom of the lobe are given below.

Particulars.	Mean length cms.	Mean maximum width cms.	Perpendicular distance from midrib to the bottom of the lobe.	
<i>S. melongena</i> parent	21.69	18.11	5.76	5.55
Hybrid	16.50	10.59	2.88	2.73
<i>S. xanthocarpum</i> parent	11.10	7.14	1.23	1.23

Spines along the midrib, secondary veins and along the petioles of the leaves are present as in the *S. xanthocarpum* parent. The lamina is rather incurved, a feature common in the *S. melongena* parent, but the degree and persistence of this nature is more marked in the hybrid than in the *S. melongena* parent. Stellate hairs are studded as in the stem to an intermediate degree of intensity.

The inflorescence is extra-axillary, cymose, each cyme consisting of 3 to 6 flowers. The extra-axillary nature of the cymes in the *S. xanthocarpum* parent has been exclusively emphasised in the F_1 . The stalk of the cyme and the pedicels of the flowers are sparsely studded with spines. In the cross, the two kinds of arrangement of flowers as occurring in the two parents are to be found in almost equal proportions. The flowers are dimorphic as in the two parents.

The flower is intermediate in size and is of the same morphology as that of the parents. But, the corolla is bent backwards, a behaviour

inherited from the *S. xanthocarpum* parent. The stamens are intermediate in size. The ovary is round; fruit, globose berry with the characteristic check pattern design like that on the berries of the *S. xanthocarpum* parent, the purple heading to an intensity from the top of the ovary to the stalk end. The fruits are only slightly bigger than the *xanthocarpum* parent.

Setting on the fruits is poor both under natural pollination and artificial self-pollination. Back crosses with the two parents are fairly successful, using the hybrid as the pistillate parent.

Pigmentation. The inheritance of the pigment in the several parts of the plant is noted below:

Particulars.	<i>S. xanthocarpum</i> parent.	Hybrid.	<i>S. melongena</i> parent.
Stem	Light purple	Medium purple	Light purple
Leaves and veins	Green	Purple	Purple
Spines	Green	Purple	No spines
Corolla	Medium violet	Deep violet	Light violet
Fruit	Light green with dark green check pattern design at the distal end.	Same as in <i>S. xanthocarpum</i> parent with purple wash all over.	Purple

The partial sterility of the hybrid, while necessitating further investigation of the controlling factors, sets a handicap to the progress of the inheritance study.

NUTRITION, INTERNATIONAL AND NATIONAL

By W. R. AYKROYD, M. D.,

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During the last year the subject of nutrition has received considerable attention from the League of Nations and the related organisation, the International Labour Office. As a result of international discussions, comprehensive schemes for the study and attack of the problem have been formulated, which are likely to have a considerable influence in the spheres of economics, agriculture, and public health.

In the Report of the Director of the I. L. O. to the Nineteenth Session of the International Labour Conference (June 1935), we find the following passage:—

“ Though there is still considerable controversy among physiologists as to the minimum needs for healthy subsistence and as to the rations of calories, proteins, mineral salts and vitamins required in different climatic conditions, it is not open to dispute that large masses of people are at present under-fed or wrongly fed. Every country is faced by a problem of this kind, but its exploration is only just beginning. It may be compared with the problem of medical treatment and maternity care, for which much has already been done wherever a sound system of health insurance has been established..... If the cure and prevention of disease is a communal affair, housing and feeding, which are the primary requisites of healthy living, are hardly less so. They were certainly not excluded from the purview of the International Labour Organisation by the Preamble to the Constitution, which lays down the ‘provision of an