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|  | **PURE-LINE SELECTION**.  ***A pure line*** *is a progeny descendent solely by self-pollination from a single homozygous plant.*  ***Pure Line*** *is progeny of single selfed homozygous plant*  ***Pure-line selection*** *refers to the procedure of isolating pure lines from a mixed population*.  Pure Lines are developed by identifying superior plants in a mixed population and then they are continuously selfed for many generations until the plants attain homozygosity nearly at all loci. A cultivar developed by pure-line selection is more uniform than a cultivar developed by mass selection, because all of the plants in the cultivar will have the same genotype. This is based on assumption that the plant originally selected is homozygous at all loci. | | |  |
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|  | **How long does the new cultivar remain pure?**  That depends upon amount of: |  |
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|  | * Seed mixtures from other sources, | | |  |
|  | * Natural crossing with other cultivars or breeding lines, and | | | | |  |  |
|  | * Mutations. |  |  |
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|  | **THE PURE-LINE THEORY**. The theory of the pure-line was established by the Danish botanist, Johannsen, in 1903. Johannsen conducted selection experiments for seed weight in a mixed seed lot of the 'Princess' bean Because beans are self-fertilized, the seeds in the original lot were homozygous for genes affecting seed weight. Initially Selection within the original mixed lot of beans was effective in isolating lines that were genetically different as the beans were divided beans in two groups one with high seed weight (0.64 g/seed) and other with low seed weight(0.35 g/seed). But when he continued the selection process to next generation. He found that there is no use of further selection in low seed weight group or high seed weight group. So he proposed pure line theory which states  ***Once the pure line was isolated, further selection within the pure line was ineffective.***  In Johannsen's original mixed lot of beans, the variations in seed weight were both hereditary and environmental; but whatever variation was observed within the pure lines, the variations were only due to differences in the effects of the environment. |  |