has been found to range from as few as 4 (anther, prior to anthesis) to as many as 16 (mature leaves).

Ontogenetic studies have been initiated for leaf blades, leaf sheaths, and internodes. These tissues were studied at anthesis from the base to the top of the plant. In the leaf tissues, there was an increase in the number of peroxidase isozymes with increasing maturity; the basal leaves had approximately twice as many isozymes as the upper leaves. In contrast, all internodes had essentially the same pattern at this time. At stages prior to anthesis, this sequential change in leaf peroxidases was even more dramatic, and a similar change was also noted in internodes. Differences in peroxidase isozyme patterns appear to reflect differences in rates of tissue enlargement and development.

Genetic analyses were completed for two of the cathodal isozymes which were designated C10 and C20. Seedling roots of inbred lines commonly exhibited either C10 or C20; both isozymes were never observed together in an inbred line. The $F_1$ from C10 x C20 always showed both isozymes and hybrid bands were never seen. Chi square analysis showed that segregations in the $F_2$ and backcross populations fit 1:2:1 (32 C10 : 62 C10, C20 : 42 C20) and 1:1 (48 C10 : 55 C10, C20 and 39 C20 : 32 C10, C20) ratios respectively. Since plants lacking both bands were never observed in these $F_2$ and backcross progenies, and no inbreds have yet been found with both isozymes, it was concluded that the two isozymes are conditioned by codominant alleles at one locus. The locus has been designated $\underline{Px}_1$, with alleles $\underline{Px}_1^1$ and $\underline{Px}_1^2$.

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1. Genetic marker stocks adapted to the tropics.

To an increasing extent maize genetic marker stocks appear to be of interest for teaching and research activity in tropical countries. At most tropical agricultural universities and schools, maize can be planted for genetic research problems or class demonstrations any month of the year.

Corn Belt maize is generally ill adapted to the tropics, principally due to its daylength sensitivity and disease susceptibility. It is difficult enough to recover seed from genetic marker stocks under the comparatively congenial conditions in Hawaii (20° N. latitude). However, the added burden from near-epiphytotic conditions of blights and rusts in much of the tropics

makes perpetuation of these stocks laborious if not impossible, especially in the short-day months of the traditional academic year.

A series of conversions of genetic marker stocks was therefore started in Hawaii, and is presently being conducted under the aegis of the National Corn and Sorghum Program of Thailand (in cooperation with The Rockefeller Foundation).

Inbreds Amarillo Theobromina 21(B)-6#-1S-7# and Peru 330-2#-2S-6# (# = sib; S = self), derived from stocks of the Coordinated Maize Improvement Scheme in India and the corresponding single cross were chosen for the initial conversion. Both lines are vigorous, dark-yellow flints with excellent disease resistance and high general combining ability. Both appear to be widely adapted in the tropics. Initial conversions include the T cytoplasm and the following genes: $\underline{a}_1$, $\underline{a}_2$, $\underline{ae}$, $\underline{an}_1$, $\underline{B}$, $\underline{br}_1$, $\underline{br}_2$, $\underline{bt}_1$, $\underline{bz}_1$, $\underline{Cg}$, $\underline{d}_1$, $\underline{d}_2$, $\underline{d}_3$, $\underline{de}_16$, $\underline{Dt}_1$, $\underline{et}$, $\underline{fl}_1$, $\underline{fl}_2$, $\underline{lg}_1$, $\underline{ms}_1$, $\underline{ms}_8$, $\underline{na}$, $\underline{o}_1$, $\underline{o}_2$, $\underline{P^{vv}}$, $\underline{prr}$, $\underline{Pl}$, $\underline{pr}$, $\underline{py}$, $\underline{r}$, $\underline{sh}_2$, $\underline{su}_1$, $\underline{Ts}_5$, $\underline{wx}$, and $\underline{y}$.

Small samples of seedstocks representing early generations of these conversions are available from the authors.

Approximately 50 other genes are being introduced in a second series of conversions to the flinty inbreds. An additional series of genetic stocks, representing about 40 alleles affecting isozyme polymorphisms, is also in preparation. These are being developed in sweet corn inbreds derived from the variety Hawaiian Sugar (widely adapted in the tropics, but susceptible to blight (H. turcicum) and rust). Cytological aberrations have not yet been introduced into the program.

Conversions are being made on a cycle of 3-4 generations/year. The scope and rate of progress of these conversions will depend to some extent on funds for, and interest in, the program. Contributions of tropically-adapted genetic and cytogenetic marker stocks would be appreciated.

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