DEVELOPMENT OF NEW GABI VARIETIES

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ABSTRACT

Four new gabi varieties: NSICG-6, NSIC G-7, NSIC G-8 and NSIC G-9 were developed using the local gabi germplasm. These varieties were generated by controlled breeding. Gibberellic acid was applied to ensure flowering. Hand pollination was adapted. From more than a thousand genotypes generated in 1992, about eight genotypes were included in the regional trials, after a series of evaluation and selection at the PhilRootcrops-LSU experiment station. Prior for recommendation to release, they were further evaluated in different regional testing sites: Albay, Bohol, Bukidnon, Leyte and Quezon Provinces. The criteria for selection include yield potential, dry matter content (DMC), resistance to *Phytoptora* leaf blight and eating quality. Yield stability indices were computed, which revealed that the different varieties are stable; NSIC G-6 was largely stable and NSIC G-9 is adapted to poor yielding environments.

INTRODUCTION

Gabi is a traditional crop in the Philippines. However, the national average is only 5.52 t/ha, while Eastern Visayas with > 4,400 hectares planted to gabi, registered an average yield of 3.50 t/ha (BAS, 2004). Choice of variety could contribute to this dismal low productivity. But, farmers choose to plant gabi that are already tried and well-adapted to the local environment. So, we attempted to improve gabi yield potential by using the local germplasm. PhilRootcrops had assembled more than 200 gabi accessions, a good source of breeding materials, which are locally adapted. Here, we report the success of gabi breeding using the Philippine gabi germplasm. Yield potential of these new varieties doubles the national average yield.

RESULTS

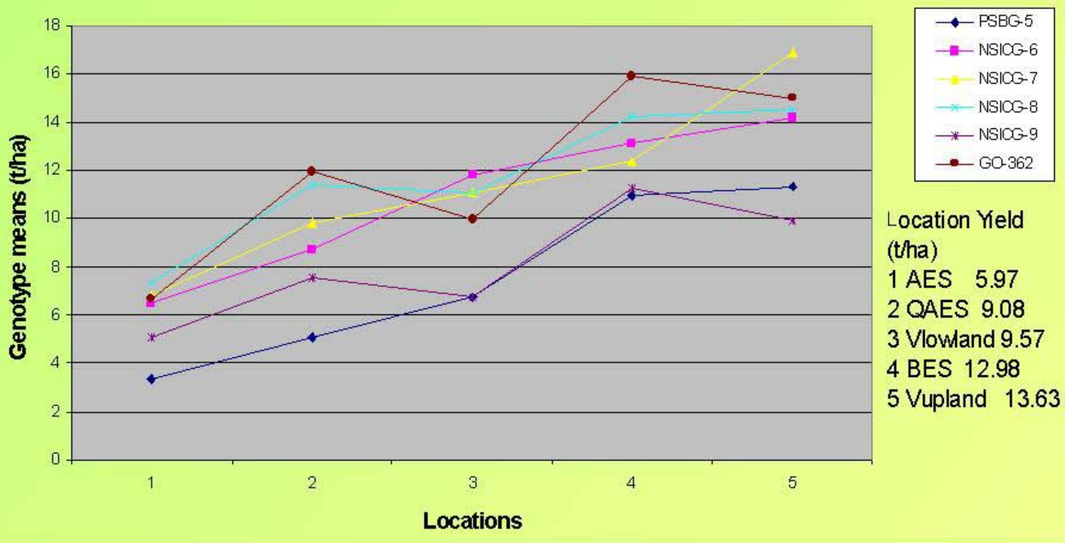
Out of several parental accessions that were induced to flower only a few developed normal flowers. Crossing was limited by the asynchronous flowering despite GA_3 application. The four varieties: NSIC G-6, NSIC G-7 and NSIC G-9 were all produced from selfing of Ini-ito (PRG – 734). This imply, that Ini-ito possesses desirable genes, thus, is a good parent for breeding. However, the yield of Ini-ito is moderate (~6.74 t/ha). NSIC G- 8 is a product of the crossing of PRG – 715 and PRG – 687. Morphological traits and dry matter content of the corm for the different varieties are shown below.

Yield stability parameters were examined based on the data obtained from the regional testing. According to the static measure of stability, that is, genotype variance and ecovalence, all four varieties are stable, with NSIC G-6 as very stable and NSIC G-8 as relatively stable (Table 1.) Figure 1 displays the stability based on the concept of dynamic index, the regression coefficient. A greatly stable variety has a slope, "b", of one. When the b value > 1, the variety is well adapted to environments with high technological input; while that with b < 1, is best grown in environments with low input.

Table 1. Genotype variance and ecovalence

Genotype	Variance	Ecovalence
NSIC G-6	0.48	4.35
NSIC G-7	1.41	12.66
NSIC G-8	1.77	15.92
NSIC G-9	1.33	11.99

Fig.1. Genotype x Location, using average means of two years



GENERATION AND EVALUATION OF GENOTYPES

1. Hand pollination of GA_3 induced flowers

2. Seeds were collected for germination

3. Seeds were germinated in sterile soil medium

4. Seedlings were transferred to field nursery for acclimatization

5. A series of selection and evaluation were done in several phases

Characteristics of the new varieties

NSIC G-6

Ave. Yield: 10.83 – 14.00 t/ha

DMC: 33.68 %

NSIC G-7

Ave. Yield: 11.62 – 16.00 t/ha

DMC: 33.82 %

NSIC G-8

Ave. Yield: 11.74 – 15.00 t/ha

DMC: 38.27 %

NSIC G-9

Ave. Yield: 7.86 – 11.83 t/ha

DMC: 44.07 %

In summary, the four varieties could be grown in both upland and lowland conditions. NSIC G-6 is adaptable to most environment, while NSIC G-8 fits production area with high technological input, while NSIC G-9 adapts to poor yielding environments.