Estimates of genetic and environmental variability in soybeans 1

Abstract

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Estimates of Genetic and Environmental Variability in Soybeans[1]

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RECENT studies on a number of characters of soybeans have been directed toward estimation of heritability, that is, the fraction of variance in phenotypic expression that arises from genetic effects. However, the different methods employed do not necessarily estimate the same thing. For example, variance and regression methods of estimating heritability of F_2 plant differences estimate the same thing only if all gene effects are additive. The nature of the selection units (plant, plot, mean of several plots, etc.) and sampling errors also influence greatly the magnitude of heritability estimates. Therefore, any meaningful comparison of the estimates obtained in different situations must include a careful evaluation of the methods and materials employed.

Heritabilities of individual plant differences were estimated by Weber and Moorthy (5), using data on spaced plants of four varieties and the F_1 and F_2 of three crosses involving the varieties. Variance among plants within the F_1's and the varieties was equated to environmental variance and subtracted from variance among F_2 plants to obtain estimates for genotypic variance. Heritability, the ratio of genotypic variance to F_2 variance, of yield was estimated to be 0, 13, and 60% in the three F_2 populations. The estimates for other characters were much more consistent from population to population and averaged as follows: flowering time, 75.6; maturity date, 75.3; period from flowering to maturity (fruiting period), 55.7; plant height, 62.0; seed weight, 54.3; and oil percentage, 54.7. Using the same method except that estimates of environmental variances were based only on variance among plants within the parent varieties, Mahmud and Kramer (4) estimated the heritability of yield and height in the F_2 of a varietal cross to be 43.4 and 40.6%, respectively. As pointed out by Weber and Moorthy, these estimates of genotypic variance contain variance due to genotype-environment interaction effects as well as genotypic variance.

Heritability of individual plant differences also may be estimated by the regression of progeny means on the performance of single plant parents. Bartley and Weber (1), using F_2 and F_3 parents, obtained estimates for yield, plant height, and maturity date, which averaged 15, 66, and 85%, respectively. Using the same method for F_2 parents, Mahmud and Kramer (4) obtained estimates of 5.9, 35.3, and 50.3% for yield, height, and maturity, respectively.

The regression of F_4 line means on F_3 line means estimates heritability of differences among the F_3 line means. Such estimates by Bartley and Weber (1) were 45, 62, and 92% and by Mahmud and Kramer (4), 77, 91, and 100% for yield, height, and maturity date, respectively. The F_3 and F_4 lines were evaluated in different years in the first case and each F_3 line and its F_4 progeny were evaluated in subplots of the same whole plot in the second.

The purpose of the present investigation was to estimate for two segregating populations of soybeans *(1)* genetic variance among F_3 lines in the F_4 and F_5 generations, *(2)* variance due to genotype-environment interactions, and *(3)* progress to be expected from selection.

MATERIALS AND METHODS

Field Experiments and Data Collected

Two populations of F_3 lines of soybeans were studied in the F_4 and F_5 generations. Eighty-nine lines resulting from the cross Roanoke × Palmetto, (population 1), and 64 lines from the cross N42-26 × Seminole (population 2) were evaluated. Each line traced to the seed of a randomly chosen F_2 plant. In both populations, lines in the F_4 generation were grown in 1950 and the F_5 generation in 1951. Population 1 lines were grown at McCullers and Statesville, N. C., and Monetta, S. C. (later referred to as Location 1, 3, and 2, respectively). Population 2 lines were grown only at McCullers and Monetta. Lines in each population were arranged in a randomized block design with 2 replications at each location in the 2 years, with a different randomization for each test. The plots were single, 19-foot rows, with 3-foot spacings between the rows. The seed were drilled at a spacing of 8 viable seed per foot of row. In 1950, growing conditions were good at all locations with above average rainfall that was well distributed throughout the season, except for a short period of drought late in the growing season at location 2. In 1951, conditions were good early in the growing season, but a severe late-summer drought occurred at all three locations. The plots at locations 2 and 3 were not harvested, and yield at location 1 was only 67% as high as in 1950.

A 16-foot section of each row was harvested for yield and chemical data were obtained from analysis of a 60-g. sample of beans from each plot. Characters measured on a plot basis were as follows: *(1)* time of flowering—recorded as the number of days from emergence to the date when half the plants in the plot were flowering; *(2)* fruiting period—recorded as the number of days from flowering to maturity; *(3)* maturity—recorded as the number of days from Sept. 1 to the date when all pods were ripe; *(4)* yield of seed in grams per plot (variances and means were converted to a bushels per acre basis for presentation); *(5)* seed weight—recorded as grams per 100 seed (based on weight of 200 seed per

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Euphytica
2018 214:5

Characterisation of sweet stem sorghum genotypes for bio-ethanol production
Acta Agriculturae Scandinavica, Section B — Soil & Plant Science
2018 68:4

Numerical and graphical assessment of relationships between traits of the Iranian Coriandrum sativum L. core collection by considering genotype × irrigation interaction
Scientia Horticulturae
2016 200

Estimation of variability and genetic parameters for nut yield in the seedling

raised natural walnut (Juglans regia L.) population in the Kashmir valley
INTERNATIONAL JOURNAL OF AGRICULTURAL SCIENCES
2018 14:1

Selection Parameters and Yield Enhancement of Wheat (Triticum aestivum L.) Under Different Moisture Stress Conditions
Asian Journal of Plant Sciences
2006 5:5

Genetic correlation and coheritability between F1and F2generations for quantitative traits in some crosses of green gram (Vigna radiataL. Wilczek)
Acta Agronomica Hungarica
2011 59:1

Genetic diversity in round gourd [Praecitrullus fistulosus (Stocks) Pangalo] accessions introduced from USDA for various qualitative and quantitative traits
Journal of Crop Improvement
2017 31:6

Provenance variation in growth and genetic potential of Aquilaria malaccensis under nursery condition
African Journal of Biotechnology
2015 14:24

Phenotypic identity, similarity and stability for selection of tomatoes (Lycopersicon esculentum L.) cultivars in South-western Nigeria
Scientia Horticulturae
2018 235

Water Stress Effects on Leaf Growth and Chlorophyll Content but Not the Grain Yield in Traditional Rice (<i>Oryza sativa</i> Linn.) Genotypes of Assam, India II. Protein and Proline Status in Seedlings under PEG Induced Water Stress
American Journal of Plant Sciences
2012 03:07

Standardizing Selection Strengths to Study Selection in the Wild: A Critical Comparison and Suggestions for the Future
BioScience
2012 62:12

Selection for Seed Yield Production of Egyptian Clover (Trifolium alexandrinum L.) C. V. Fahl
Plant Breeding
1989 103:4

Genetic variability of some chickpea (Cicer arietinum L.) genotypes and correlation among yield and related traits in humid tropics of southern Ethiopia
Journal of Plant Breeding and Crop Science
2018 10:10

Translation of phenotypic diversity ofSorghum bicoloraxillary branched mutant into exploitable heterosis
Plant Breeding
2016 135:2

Evaluation of drought and heat tolerance in wheat based on seedling traits and molecular analysis
Journal of Crop Science and Biotechnology
2014 17:3

Genetic variability, analysis of genetic parameters, character associations and contribution for agronomical traits in turmeric (Curcuma longa L.)
Industrial Crops and Products
2015 76

Relationship among phenotypic and quality traits in indigenous and exotic accessions of linseed
Pesquisa Agropecuária Brasileira
2016 51:12

Genetic variation, heritability, divergence

and biomass accumulation of rice genotypes resistant to bacterial blight revealed by quantitative traits and ISSR markers
Physiologia Plantarum
2013

Effect of combined x-ray and diethyl sulphate treatments on mutation frequencies in rice (Oryza sativa L.)
Radiation Botany
1975 15:4

Qualitative and Quantitative Aspects of Teasle Gourd Genotypes
International Journal of Vegetable Science
2018 24:4

Genetic variability, heritability and genetic advance of growth and yield components of Jatropha (Jatropha curcas Linn.) genotypes
Trees
2013 27:4

Genetic Variability and Direct Selection Criterion for Seed Yield in Segregating Generations of Barley (<i>Hordeum vulgare</i> L.)
American Journal of Plant Sciences
2015 06:09

Variability studies for quality traits in rice with high iron and zinc content in segregating population
Journal of Cereals and Oilseeds
2015 6:7

Characterisation of globally diverse blast-resistant upland rice (Oryza sativaL.) germplasms based on morpho-physiological and yield attributes
Acta Agriculturae Scandinavica, Section B — Soil & Plant Science
2016 66:5

AGRO-PHYSIOLOGICAL CHARACTERIZATION OF DURUM WHEAT GENOTYPES UNDER DROUGHT CONDITIONS
Experimental Agriculture
2019 55:3

Genetic Effects Conferring Heat Tolerance in a Cross of Tolerant × Susceptible Maize (Zea mays L.) Genotypes
Frontiers in Plant Science
2016 7

Genetic variability, heretability, correlation co-efficient and path analysis of yield and yield contributing traits in bread wheat (Triticum aestivum L.)
INTERNATIONAL JOURNAL OF PLANT SCIENCES
2017 12:2

Implications of Gene Actions for Different Qualitative and Quantitative Traits in Linseed (Linum usitatissimum L.)
Russian Agricultural Sciences
2018 44:5

Diversity and variability in seed characters and growth of Pongamia pinnata (L.) Pierre accessions
Trees
2011 25:4

Genotypic and Phenotypic Variances and Covariances in Early Maturing Grain Sorghum in a Double Cropping
Plant Production Science
1999 2:1

Phenotypic diversity and relationships among a worldwide durum wheat (Triticum turgidum L. var. durum) germplasm collection under rainfed conditions of Iran
Crop and Pasture Science
2013 64:2

Genetic parameters for yield improvement in sesame
AGRICULTURE UPDATE
2017 12:Special-7

Variability studies for needle and wood

traits of different half sib progenies of Pinus roxburghii Sargent
Physiology and Molecular Biology of Plants
2016 22:2

LEAF ION CONTENT, YIELD AND FRUIT QUALITY OF FIELD-GROWN MELON UNDER SALINE CONDITIONS
Experimental Agriculture
2018

Genetic variability analysis for yield and its component traits in rice (Oryza sativa L.)
ASIAN JOURNAL OF BIO SCIENCE
2018 13:2

GENERATION MEAN ANALYSIS OF DROUGHT TOLERANCE IN WHEAT (TRITICUM AESTIVUM L.)
Acta Agronomica Hungarica
2001 49:1

Variability, heritability, character association, path analysis and morphological diversity in snake gourd
Agriculture and Natural Resources
2016 50:6

Quantitative trait variation is revealed in a novel hypomethylated population of woodland strawberry (Fragaria vesca)
BMC Plant Biology
2016 16:1

Genetic variability, heritability, genetic advance and character association studies in F3 generation of cross JK8 x Peddasame (purple late) in little millet (Panicum miliare L.)
ASIAN JOURNAL OF BIO SCIENCE
2016 11:2

Genetic variation and heritability of kernel physical quality traits and their association with selected agronomic traits in groundnut (Arachis hypogeae) genotypes from Uganda
African Journal of Agricultural Research
2019 14:10

SOME BIOMETRICAL STUDIES ON NINE AGRONOMIC TRAITS IN GRAIN SORGHUM, SORGHUM BICOLOR (L.) MOENCH: I. Variance Components and Heritability Estimates
Canadian Journal of Genetics and Cytology
1970 12:2

Selection of Superior Lentil (Lens esculentaM.) Genotypes by Assessing Character Association and Genetic Diversity
The Scientific World Journal
2014 2014

Variability in Grain Quality Characters of Upland Rice of Assam, India
Rice Science
2010 17:4

Understanding the inheritance of mungbean yellow mosaic virus (MYMV) resistance in mungbean (Vigna radiata L. Wilczek)
Molecular Breeding
2017 37:5

Molecular mapping of genomic regions harbouring QTLs for root and yield traits in sorghum (Sorghum bicolor L. Moench)
Physiology and Molecular Biology of Plants
2013 19:3

Path-coefficient analyses and genetic parameters of the components of field resistance of potatoes to late blight
Annals of Applied Biology
1995 127:2

Genetic Variation, Heritability, and Diversity Analysis of Upland Rice (Oryza sativaL.) Genotypes Based on Quantitative Traits
BioMed Research International
2015 2015

Occurrence of aphid vector and genetic tolerance to infection by potyvirus in hot

pepper
Euphytica
2010 172:1

Genetic Relationship Between Foliage Yield and its Biochemical Components in Vegetable Amaranth
International Journal of Vegetable Science
2016 22:4

Genetic variability on protein content of blackgram [Vigna mungo (L.) Hepper] induced by gamma rays and EMS
INTERNATIONAL JOURNAL OF PLANT SCIENCES
2016 11:1

Estimation of variability parameters within 'Mysore' banana clones and their implication for crop improvement
Scientia Horticulturae
2000 84:1-2

Variation in cone and seed characters in blue pine (Pinus wallichiana) across natural distribution in western Himalayas
Journal of Forestry Research
2012 23:2

Environmental Response and Influence of Flag Leaf Area on Grain Protein Percentage and Yield in Bread Wheat
Pakistan Journal of Biological Sciences
2003 6:15

Induced polygenic variability using combination treatment of gamma rays and ethyl methane sulphonate in blackgram (Vigna mungo (L.) Hepper)
African Journal of Biotechnology
2015 14:20

Genetic variability, heritability and genetic advance for quantitative traits in coffee (Coffea arabica L.) accessions in Ethiopia
African Journal of Agricultural Research
2017 12:21

Variation and Heritability of Sixteen Characters in West African Okra, Abelmoschus Caillei (A. Chev.) Stevels
Plant Breeding and Seed Science
2014 66:1

Genetics of wide compatible gene and variability studies in rice (Oryza sativa L.)
Journal of Genetics
2016 95:2

Genetic Variability and Path Analysis Studies in Hybrid Maize (<i>Zea mays</i> L.)
American Journal of Plant Sciences
2017 08:12

Variability and Heritability for Yield and its Components in Upland Cotton. (Gossypium Hirsutum)
East African Agricultural and Forestry Journal
1986 52:1

Lentil
2007

Morphological variability in 17 wild elephant foot yam (Amorphophallus paeoniifolius) collections from southwest India
Genetic Resources and Crop Evolution
2011 58:8

1962 14

GENECOLOGICAL STUDIES OF URTICA DIOICA L.. I. THE NATURE OF INTRASPECIFIC VARIATION IN U. DIOICA
New Phytologist
1982 92:3

Genetic Variability, Correlation and Path Coefficient Analysis in Tomato
International Journal of Vegetable Science
2013 19:4

Fusarium head blight resistance in Aegilops tauschii

Genetic Resources and Crop Evolution
2017 64:8

Variability and divergence in Pongamia pinnata for further use in tree improvement
Journal of Forestry Research
2011 22:2

Breeding Superior Orange-Fleshed Sweetpotato Cultivars for West Africa
Journal of Crop Improvement
2016 30:3

Genotypic variability in some sun flower (Helianthus annuus L.) hybrids evaluated in Khordunia under rainfed conditions
African Journal of Agricultural Research
2018 13:16

Evaluation of Genetic Diversity and Interrelationships of Agro-Morphological Characters in Soybean (Glycine max) Genotypes
Proceedings of the National Academy of Sciences, India Section B: Biological Sciences
2015 85:2

Marker-trait association study for sucrose and yield contributing traits in sugarcane (Saccharum spp. hybrid)
Euphytica
2015 205:1

Generation mean analysis in wheat (Triticum aestivum L.) under drought stress conditions
Annals of Agricultural Sciences
2014 59:2

Variability, Heritability and Genetic Advance for Some Yield and Yield Related Traits and Oil Content in Ethiopian Coriander (Coriandrum sativum L.) Genotypes
International Journal of Plant Breeding and Genetics
2015 9:3

Genetic Variability, Genotypic and Phenotypic Correlations and Path-Coefficient Analysis in Egyptian Clover (Trifolium alexandrinum L.)
Journal of Agronomy and Crop Science
1986 157:1

Effectiveness of selection under different mating systems for the improvement of protein content in wheat (Triticum aestivum L. em Thell.)
Theoretical and Applied Genetics
1978 53:3

Genetic Variability and Selection Criteria in Rice Mutant Lines as Revealed by Quantitative Traits
The Scientific World Journal
2014 2014

COMPARING STRENGTHS OF DIRECTIONAL SELECTION: HOW STRONG IS STRONG?
Evolution
2004 58:10

Proposed breeding strategy for yield improvement of hexaploid triticale (× triticosecale Wittmack) 1. Genetic variability and phenotypic stability
New Zealand Journal of Crop and Horticultural Science
1995 23:1

Traits association and path coefficient analysis of yield and related traits in rainfed lowland rice (Oryza sativa L.) genotypes in North Western Ethiopia
African Journal of Plant Science
2019 13:1

Recurrent selection for yield in Glycine max using genetic male-sterility
Euphytica
1990 50:1

Variation inPoa annuaL. from the North of Scotland
Transactions of the Botanical Society of

Edinburgh
1983 44:2

Studies on Heritability and Multivariate Analyses in Brinjal (Solanum Melongena L.)
Vegetable Crops Research Bulletin
2012 76:1

Inheritance of high iron and zinc concentration in selected bean varieties
Euphytica
2015 205:2

Genetic variability and interrelationship of traits in the industrial oil crop Vernonia galamensis
Euphytica
2005 142:1-2

Variability Analysis of Traits Related to Callus Growth and Plant Regeneration in Drought Resistant Local Land Races of Rice (Oryza sativa L.)
Asian Journal of Plant Sciences
2002 1:5

Comparison between the SPD and the SPDS methods for segregating generation advancement in soybean
Brazilian Archives of Biology and Technology
2003 46:4

Morphological, agronomic, and yield characterization of cluster bean (cyamopsis tetragonoloba L.) germplasm accessions
Journal of Crop Science and Biotechnology
2015 18:2

Genome-wide DArT and SNP scan for QTL associated with resistance to stripe rust (Puccinia striiformis f. sp. tritici) in elite ICARDA wheat (Triticum aestivum L.) germplasm
Theoretical and Applied Genetics
2015 128:7

Genetic variability, correlation and path analysis of yield and grain quality traits in bread wheat (Tritium aestivum L.) genotypes at Axum, Northern Ethiopia
Journal of Plant Breeding and Crop Science
2017 9:10

Genetic evaluation of twenty seed sources of Asparagus racemosus
Journal of Forestry Research
2011 22:1

Variability Assessment of Aromatic and Fine Rice Germplasm in Bangladesh Based on Quantitative Traits
The Scientific World Journal
2016 2016

Bericht über das Jahr 1955
1956

Studies on genetic variability, heritability and genetic advance for quantitative characters in field pea
INTERNATIONAL JOURNAL OF PLANT SCIENCES
2018 13:1

Genetic analysis of leaf explant regenerability inSolanum chacoense
Plant Cell, Tissue and Organ Culture
1996 47:1

Population Structure and Marker-Trait Association in Indigenous Aromatic Rice
Rice Science
2017 24:3

Heritability and Interrelationships of Pod Length and Seed Weight in Guar
Plant Breeding
1989 103:1

Melhoramento da soja: II. Melhoramento por hibridação
Bragantia
1958 17:unico

Genetic diversity of sweet yam Dioscorea

dumetorum (Kunth) Pax revealed by morphological traits in two agro-ecological zones of Cameroon
African Journal of Biotechnology
2015 14:9

Groundnut (Arachis hypogaea L.) improvement in sub-Saharan Africa: a review
Acta Agriculturae Scandinavica, Section B — Soil & Plant Science
2019

Genetic Studies of Two Crosses of Brassica Campestris L.
Experimental Agriculture
1970 6:04

Genetic variation in high-protein pea
Qualitas Plantarum Plant Foods for Human Nutrition
1982 31:3

Evaluation and utilization of Aegilops and wild Triticum species for enhancing iron and zinc content in wheat
Genetic Resources and Crop Evolution
2009 56:1

Inter-characters associations in pearl millet (Pennisetum glaucumL.R.Br.) germplasm in hot-arid climate
ASIAN JOURNAL OF BIO SCIENCE
2015 10:2

Genetic Variability Induced by Gamma Rays and Preliminary Results of Low-Cost TILLING on M2 Generation of Chickpea (Cicer arietinum L.)
Frontiers in Plant Science
2018 9

Identification of marker-trait associations for morphological descriptors and yield component traits in sugarcane
Physiology and Molecular Biology of Plants
2017 23:1

Evaluation of faba bean (Vicia faba L.) varieties for yield and reaction to chocolate spot disease at Chencha, Southern Ethiopia
African Journal of Plant Science
2018 12:8

Zum gegenwärtigen Stand der Anwendungsmöglichkeiten der biometrischen Genetik in der Pflanzenzüchtung
Der Züchter
1965 35:4

Variability and divergence in horsegram (*Dolichos uniflorus*)
Journal of Arid Land
2012 4:1

Inheritance of Resistance to Sorghum Shoot Fly, Atherigona soccata in Sorghum, Sorghum bicolor (L.) Moench
Frontiers in Plant Science
2016 7

Genotypic variability estimates of agronomic traits in secondary triploid banana Matooke (Musa sp., AAA-EA) hybrids
African Journal of Plant Science
2016 10:4

Determination of Genetic Variability and Divergence for Root Yield and Quality Characters in Temperate Radishes
International Journal of Vegetable Science
2012 18:4

Genetic Analysis in Segregating Generation of Wax Gourd
International Journal of Vegetable Science
2015 21:3

Genetic variability, heritability and genetic advance in tomato [Solanum lycopersicon (Mill.) Wettsd]
THE ASIAN JOURNAL OF HORTICULTURE
2017 12:1

Morpho-Physiological Traits Imparting Salinity Tolerance in Maize (Zea Mays L.) Hybrids under Saline Water Irrigation in Vertisols
Communications in Soil Science and Plant Analysis
2016

Studies on the diversity and selection of superior types in jackfruit (Artocarpus heterophyllus Lam.)
Genetic Resources and Crop Evolution
2013 60:5

Association of SSR markers and morpho-physiological traits associated with salinity tolerance in sugar beet (Beta vulgaris L.)
Euphytica
2015 205:3

Genome-Wide Search for Quantitative Trait Loci Controlling Important Plant and Flower Traits in Petunia Using an Interspecific Recombinant Inbred Population of Petunia axillaris and Petunia exserta
G3: Genes|Genomes|Genetics
2018 8:7

Mechanisms and genetic diversity for host plant resistance to spotted stem borer, Chilo partellus in sorghum, Sorghum bicolor
Journal of Applied Entomology
2012 136:5

Technological Innovations in Major World Oil Crops, Volume 1
2012

Phenological development, grain growth rate and yield relationships in wheat cultivars under late sown condition
Indian Journal of Plant Physiology
2014 19:3

Inheritance of Drought Tolerance in Chickpea (Cicer arietinum L.) Using Joint Scaling Test
Journal of Applied Sciences
2008 8:21

Variability in Growth, Physiological, and Biochemical Characteristics among Various Clones ofDalbergia sissooin a Clonal Seed Orchard
International Journal of Forestry Research
2014 2014

Heritability estimates in almond [Prunus dulcis (Miller) D.A. Webb]
Scientia Horticulturae
1999 79:3-4

Genetic variability of common bean (Phaseolus vulgaris L.) genotypes under sole and maize-bean cropping systems in Bako, Western Oromia, Ethiopia
African Journal of Agricultural Research
2019 14:7

Characterisation of 4274 accessions of common bean (Phaseolus vulgaris L.) germplasm conserved in the Indian gene bank for phenological, morphological and agricultural traits
Euphytica
2015 205:2

Association analysis for pomological traits in mango (Mangifera indica L.) by genic-SSR markers
Trees
2017 31:5

Mutagenesis: exploring genetic diversity of crops
2014

Genetic potentiality of lowland indigenous indica rice (Oryza sativa L.) landraces to anaerobic germination potential
Indian Journal of Plant Physiology
2019

Study on Genetic Variability and Heterosis in Potato
Pakistan Journal of Biological Sciences
2005 8:1

Variability, heritability and genetic association in vegetable amaranth (Amaranthus tricolor L.)
Spanish Journal of Agricultural Research
2015 13:2

Genetic variation and phenotypic plasticity of roots in two cultivated species of jute (Corchorus olitorus L. andC. capsularis L.)
Biologia Plantarum
1967 9:4

Combining Ability Analysis for Bacterial Leaf Spot Resistance, Leaf Yield, and Agronomic Traits in Mulberry Clones
Journal of Crop Improvement
2014 28:3

Genetic Analysis for Some Characteristics in Cotton (Gossypium hirsutum L.)
Journal of Biological Sciences
2003 3:2

Clonal evaluation for increased seed production in two species of forage grasses, Festuca arundinacea Schreb. and Phleum pratense L.
Euphytica
1972 21:2

Studies on genetic variability for yield and yield traits in rice (Oryza sativa L.)
INTERNATIONAL JOURNAL OF PLANT SCIENCES
2018 13:1

Profiling of Mineral Nutrients and Variability Study in Pumpkin (Cucurbita moschata) Genotypes
Agricultural Research
2018 7:2

Yield components of potato microtubers: in vitro production and field performance
Annals of Applied Biology
1998 133:1

Enhancing selenium concentration in lentil (Lens culinaris subsp. culinaris) through foliar application
The Journal of Agricultural Science
2015 153:04

A Study of Variability, Associations, and Path Analysis in Poplar (Populus deltoidesBartr. ex Marsh)
Journal of Sustainable Forestry
2012 31:3

Analysis of morphological variability in the Indian germplasm of Allium sativum L.
Plant Systematics and Evolution
2014 300:2

Induced genetic variability in Rhizobium leguminosarum for nitrogen fixation parameters in Vicia faba L.
Theoretical and Applied Genetics
1989 78:3

Genetic diversity analysis of selected Capsicum annuum genotypes based on morphophysiological, yield characteristics and their biochemical properties
Journal of the Science of Food and Agriculture
2019 99:1

Quantitative Genetic Variation in Gum Arabic (Acacia senegal (L) Willd) Provenances
American Journal of Plant Sciences
2015 06:18

Traits association and variability study in blackgram [Vigna mungo (L.) Hepper]
AGRICULTURE UPDATE
2017 12:Special-4

Plant Breeding Reviews
2011

Interval mapping of quantitative trait loci for reproductive, morphological, and seed traits of soybean (Glycine max L.)
Theoretical and Applied Genetics
1993 86:8

Genetic variability and correlation analysis

of rice (Oryza sativa L.) inbred lines based on agro-morphological traits
African Journal of Agricultural Research
2016 11:35

Variability and divergence inPongamia pinnata(L.) Pierre germplasm - a candidate tree for biodiesel
GCB Bioenergy
2009 1:6

Effect of drought on yield and drought susceptibility index for quality characters of promising rice genotypes
Cereal Research Communications
2011 39:1

Variability in pod and seed traits of Pongamia pinnata Pierre ecotypes in North Karnataka, India
Journal of Forestry Research
2016 27:3

Screening of pea germplasm for resistance to powdery mildew
Euphytica
2013 189:2

Phenotypic and genotypic relationships between traits in saffron (Crocus sativus L.) as revealed by path analysis
Journal of Applied Research on Medicinal and Aromatic Plants
2017 5

High yielding and trait specific genotypes and genetic associations among yield and yield contributing traits in Jatropha curcas L.
Agroforestry Systems
2018 92:5

Genetic Variation, Association of Characters, and Their Direct and Indirect Contributions for Improvement in Chilli Peppers
International Journal of Vegetable Science
2009 15:4

Variation, inheritance and correlation of growth characteristics of Populus deltoides Bartr. at various ages in the central-plain region of Punjab, India
Forestry Studies in China
2010 12:3

Mode of gene action, heterosis and inbreeding depression for yield and its components in tomato (Solanum lycopersicum L.)
Scientia Horticulturae
2013 164

Assessing genetic potential of elite interspecific and intraspecific advanced lentil lines for agronomic traits and their reaction to rust (Uromyces viciae-fabae)
Crop and Pasture Science
2018 69:10

Inheritance and combing ability in maize using a 7x7 diallel cross
Journal of Plant Breeding and Crop Science
2018 10:9

Variation and interrelationships of agronomic traits in Ethiopian tetraploid wheat landraces
Euphytica
1993 71-71:3

Genetic variability and estimates of heritability in sorghum (Sorghum bicolorL.) genotypes grown in a semiarid zone of Sudan
Archives of Agronomy and Soil Science
2016 62:1

Quantitative Estimation of Genetic Variability in Morphological Characteristics of Eastern Cottonwood (Populus deltoidesBartr.) Clones
Journal of Sustainable Forestry
2012 31:7

Influence of altitude on seed and seedling characteristics in Quercus

leucotrichophora A. Camus. ex. Bahadur
Silvae Genetica
2012 61:1-6

Study of morphological and molecular characterization of garlic (Allium sativum L.)
THE ASIAN JOURNAL OF HORTICULTURE
2017 12:1

Genetic Diversity of the 1995 RRIM Hevea Germplasm Collection for Utilisation in the Rubber Breeding Programme
Journal of Rubber Research
2018 21:2

Analysis of Variance and Influence of Number of Grains Per spike on Protein Percentage and Yield in Wheat Under Different Environmental Conditions
Pakistan Journal of Biological Sciences
2003 6:4

Genetic Variability for Ozone Insensitivity in Vegetable-Type Soybeans
Journal of New Seeds
1999 1:2

Growth and heritability estimates among clones of Dalbergia sissoo Roxb. in a clonal seed orchard
Forestry Studies in China
2011 13:3

Genetic parameters of selection and stability and identification of divergent parents for hybridization in rice bean (Vigna umbellata Thunb. (Ohwi and Ohashi)) in India
The Journal of Agricultural Science
2009 147:05

Estimates of Genetic Parameters of Yield Components in Pepper (Capsicum Annuum L.)
East African Agricultural and Forestry Journal
1987 52:3

Assessment of Genetic Variability, Genetic Advance, Correlation and Path Analysis for Morphological Traits in Sesame Genotypes
Asian Journal of Agricultural Research
2014 8:4

Inheritance of quantitative traits in opium poppy (Papaver somniferum L.)
Genetika
2011 43:1

Correlation and path coefficient analysis of yield and quality components of garden cress (Lepidium sativum L.) genotypes in Ethiopia
Journal of Plant Breeding and Crop Science
2018 10:10

Genetic variability and interrelationship among various morphological and quality traits in quinoa (Chenopodium quinoa Willd.)
Field Crops Research
2007 101:1

Rice Crop - Current Developments
2018

Genotypic variability in vegetable amaranth (Amaranthus tricolor L for foliage yield and its contributing traits over successive cuttings and years
Euphytica
2006 151:1

Identification of iron deficiency chlorosis tolerant sources from mini-core collection of groundnut (Arachis hypogaea L.)
Plant Genetic Resources: Characterization and Utilization
2018 16:5

Variation among poplar clones for growth and crown traits under field conditions at two sites of North-western India
Journal of Forestry Research
2013 24:1

Genetics of carotenoids for provitamin A biofortification in tropical-adapted maize
The Crop Journal
2016 4:4

Genetic variability, character association and divergence studies in Jatropha curcas for improvement in oil yield
Trees
2016 30:4

Heritability and Correlation among Sugarcane (<i>Saccharum</i> spp.) Yield and Some Agronomic and Sugar Quality Traits in Ethiopia
American Journal of Plant Sciences
2016 07:10

Diallel analysis and separation of genetic variance components in eight faba bean genotypes
Annals of Agricultural Sciences
2014 59:1

Accumulation of phytate in vegetable-type soybean genotypes harvested at four developmental stages
Plant Foods for Human Nutrition
1997 50:3

Studies on genetic variability and correlation for fruit yield and fruit quantity characters of okra
THE ASIAN JOURNAL OF HORTICULTURE
2016 11:1

Identification of high yielding and blast disease resistant F6 RILs in finger millet
INTERNATIONAL JOURNAL OF AGRICULTURAL SCIENCES
2017 13:2

Genetic Parameters Estimation of Agronomic Traits in Soybean Population Resistant to Whitefly
IOP Conference Series: Earth and Environmental Science
2018 197

Selection in Faba Bean for Tolerance to Broomrape, Orobanche crenata Forsk.
Plant Breeding
1988 100:4

Variability in seed traits and genetic divergence in a clonal seed orchard of Dalbergia sissoo Roxb.
Journal of Forestry Research
2012 23:1

Genotypic variability for drought tolerance-related morpho-physiological traits among indigenous rice landraces of Jeypore tract of Odisha, India
Journal of Crop Improvement
2019 33:2

Post-harvest evaluation of selected inbred lines to maize weevil Sitophilus zeamais resistance
Journal of Plant Breeding and Crop Science
2018 10:5

Mapping quantitative trait loci controlling oil content, oleic acid and linoleic acid content in sunflower (Helianthus annuus L.)
Molecular Breeding
2016 36:7

Assessment of Selection Criteria for Development of High Yielding Genoptypes Using Variability Parameters in Lemongrass Cymbopogon flexuosus L.
Journal of Essential Oil Bearing Plants
2017 20:6

Seed and Seedling Vigour in Tropical Maize Inbred Lines
Plant Breeding and Seed Science
2014 67:1

Components of Resistance to Bacterial Blight Disease of Rice
Journal of Phytopathology
1987 119:4

Studies on genetic variability, heritability and genetic advance in lisianthus [Eustoma grandiflorum (Raf.) Shinners]
AGRICULTURE UPDATE
2017 12:Special-2

Agromorphological Traits Variability of the Ethiopian Lentil and Exotic Genotypes
Advances in Agriculture
2014 2014

Genetic variability studies of fruit yield and its traits among indeterminate tomato genotypes under open field condition
African Journal of Agricultural Research
2015 10:32

Variability studies in cucumber (Cucumis sativus L.)
THE ASIAN JOURNAL OF HORTICULTURE
2017 12:1

Heritability and Genetic Advance among Chili Pepper Genotypes for Heat Tolerance and Morphophysiological Characteristics
The Scientific World Journal
2014 2014

PRELIMINARY STUDIES ON PHYSICAL AND NUTRITIONAL QUALITIES OF SOME INDIGENOUS AND IMPORTANT RICE CULTIVARS OF NORTH-EASTERN HILL REGION OF INDIA
Journal of Food Quality
2008 31:6

Genotypic variation and correlations between yield system traits and yield components in African landraces of bambara groundnut
South African Journal of Plant and Soil
2017 34:2

Trait Diversity, Heritability and Genetic Advance in Selected Germplasm Lines of Tef [Emgmstis tef(Zucc.) Trotter]
Hereditas
2000 133:1

Mineral Profile and Variability in Vegetable Amaranth (Amaranthus tricolor)
Plant Foods for Human Nutrition
2006 61:1

Quantitative variability in wheat following irradiation, EMS, and hybridization
Theoretical and Applied Genetics
1972 42:4

Variation and association analysis in coriander
Euphytica
1991 58:1

Downy mildew resistance in opium poppy: resistance sources, inheritance pattern, genetic variability and strategies for crop improvement
Euphytica
2009 165:1

Genetic Diversity and Heritability Characters Associated in Sweet Sorghum [Sorghum bicolor (L.) Moench]
Sugar Tech
2014 16:2

Comparison of two methods for estimating parameters of harvest index increase during seed growth
Field Crops Research
2004 89:2-3

Genetic Diversity of Upland Rice Germplasm in Malaysia Based on Quantitative Traits
The Scientific World Journal
2012 2012

Improvement of Crops in the Era of Climatic Changes
2014

Variability, heritability and genetic advance studies in F2 population of rice (Oryza sativa L.)
INTERNATIONAL JOURNAL OF

FORESTRY AND CROP IMPROVEMENT
2016 7:1

Variability in seed- and seedling-related traits of Millettia ferruginea, a potential agroforestry species
New Forests
2008 36:1

Soyabeans in Tanzania: II. Seasonal variation and homeostasis in soyabeans
The Journal of Agricultural Science
1967 69:03

A GENECOLOGICAL STUDY OF PUCCINELLIA MARITIMA HUDS. (PARL.) I. VARIATION ESTIMATED FROM SINGLE-PLANT SAMPLES FROM BRITISH POPULATIONS
New Phytologist
1980 85:1

Studies on Aluminium Tolerance and Morphological Traits in Rice Lines from North Eastern India
Proceedings of the National Academy of Sciences, India Section B: Biological Sciences
2016 86:1

Estimates of variance for root proliferation in Alfalfa
Journal of Genetics
1959 56:3

Selection Criteria for Improving Yield in Chili (Capsicum annuum)
Advances in Agriculture
2017 2017

Estimation of heritability and prediction of selection response in plant populations
Critical Reviews in Plant Sciences
1991 10:3

Agro-morphological characterization and assessment of variability, heritability, genetic advance and divergence in bacterial blight resistant rice genotypes
South African Journal of Botany
2013 86

Genetic Variability of Exotic Sugarcane Genotypes
Scientifica
2017 2017

Estimates of genetic components for yield and yield related traits of Tannia (Xanthosoma sagittifolium (L.) Schott) genotypes at Jimma, Southwest Ethiopia
African Journal of Agricultural Research
2015 10:1

Morpho-agronomic characterization and estimates of genetic parameters in annatto plant
Horticultura Brasileira
2017 35:2

Selecting donor parents for future breeding aiming at tolerance to viral diseases with special emphasis on enation leaf curl virus in Okra
International Journal of Vegetable Science
2018

Effect of variety and location on growth and yield components of Roselle,HIbiscus sabdariffaL. and its infestation with the spiny bollwormEarias insulana(BOISD.)
Archives Of Phytopathology And Plant Protection
2004 37:3

Variability, Heritability and Genetic Advance for Some Yield and Yield Related Traits in Barley (Hordeum vulgare L.) Landraces in Ethiopia
International Journal of Plant Breeding and Genetics
2015 9:2

Genetic resource management for enhancing saffron productivity in Jammu and Kashmir
Acta Horticulturae
2018 1200

Estimates of Genetic and Environmental Variability in Sesame
Experimental Agriculture
1974 10:02

Genetic Variation and Association Analysis for Fruit Yield, Agronomic and Quality Characters in Bell Pepper
International Journal of Vegetable Science
2009 15:3

Estimation of Heritability and Genetic Advance of Yield and Yield Related Traits in Bread Wheat (Triticum aestivum L.) Genotypes at Ofla District, Northern Ethiopia
International Journal of Plant Breeding and Genetics
2016 10:1

Genetic variability and heritability in cultivated okra [Abelmoschus esculentus (L.) Moench]
Spanish Journal of Agricultural Research
2012 10:1

Variability and covariability for plant height, heading date, and seed weight in wheat crosses
Theoretical and Applied Genetics
1971 41:3

Genetic variation of stem-borer resistance and tolerance in three sorghum crosses
International Journal of Tropical Insect Science
1985 6:03

Relative efficiency of two mating systems and selection procedures for yield improvement in wheat (Triticum aestivum L.)
Theoretical and Applied Genetics
1985 71:1

Determining the most effective traits to improve saffron (Crocus sativus L.) yield
Physiology and Molecular Biology of Plants
2016 22:1

Magnitude of Heritability and Characters Association in Selected Population of Sugarcane Germplasm Under Alkaline Condition
Sugar Tech
2017 19:4

Study on biophysical and biochemical basis of shoot and fruit borer tolerance in brinjal
INTERNATIONAL JOURNAL OF PLANT PROTECTION
2017 10:2

Estimates of variation and heritability of some quantitative and quality characters inTriticum turgidumL. ssp.durum(Desf.)
Acta Agronomica Hungarica
2007 55:2

Genome-Enabled Prediction Models for Yield Related Traits in Chickpea
Frontiers in Plant Science
2016 7

Identification of diverse genotypes with high oil content in Madhuca latifolia for further use in tree improvement
Journal of Forestry Research
2015 26:2

Genotypic and phenotypic variability in cowpea grown in a humid environment in Nigeria
Tropical Science
2006 46:2

Epichloë endophyte and plant genotype determine seed production through self-pollination in tall fescue
Euphytica
2017 213:11

Agronomic and physiological responses of Chinese facultative wheat genotypes to high-yielding Mediterranean conditions
The Journal of Agricultural Science
2016 154:05

Early ground cover and other physiological traits as efficient selection criteria for grain yield under moisture deficit stress conditions in wheat (Triticum aestivum L.)
Indian Journal of Plant Physiology
2013 18:3

Studies on genetic variability and genetic advance for yield parameters in watermelon (Citrullus lanatus Thumb.)
THE ASIAN JOURNAL OF HORTICULTURE
2018 13:2

Components of yield and quality in intraspecific hybrids ofSaccharum officinarum L. selected for ancillary uses
Sugar Tech
1999 1:4

Physicochemical Characteristics of Sweetpotato (Ipomoea batatas (L.) Lam) Starch Depending on Cultivation Periods
Korean Journal of Food Science and Technology
2014 46:6

Genome-wide identification of quantitative trait loci for important plant and flower traits in petunia using a high-density linkage map and an interspecific recombinant inbred population derived from Petunia integrifolia and P. axillaris
Horticulture Research
2019 6:1

COMPARING STRENGTHS OF DIRECTIONAL SELECTION: HOW STRONG IS STRONG?
Evolution
2004 58:10

Genetic control of in vitro shoot regeneration from leaf explants inSolanum chacoense Bitt.
Theoretical and Applied Genetics
1994 88:5

Genetics of the resistance to powdery mildew disease in mungbean (Vigna radiata (L.) Wilczek)
Journal of Crop Science and Biotechnology
2009 12:1

Narrow sense heritability estimates of bacterial leaf spot resistance in pseudo F2 (F1) population of mulberry (Morus spp.)
European Journal of Plant Pathology
2012 133:3

Survey and selection of Jatropha curcas L. germplasm: Assessment of genetic variability and divergence studies on the seed traits and oil content
Industrial Crops and Products
2018 118

Variability, repeatability, character correlation and path coefficient analyses in yellow yam
Theoretical and Applied Genetics
1984 69:2

Triticale
2015

Population and quantitative genomic properties of the USDA soybean germplasm collection
Plant Genetic Resources: Characterization and Utilization
2018 16:6

Oil content, fatty acid composition and tocopherol concentration in the Spanish almond genebank collection
Scientia Horticulturae
2014 177

Genetic divergence in indigenous and exotic rice germplasm
AGRICULTURE UPDATE
2017 12:Special-6

Study of Genetic Variability and GxE Interaction of Some Quantitative Traits in Blackgram [Vigna mungo (L.) Hepper]
Journal of Biological Sciences

2007 7:1

Comparative Agronomic Performance and Reaction to Fusarium wilt of Lens culinaris × L. orientalis and L. culinaris × L. ervoides derivatives
Frontiers in Plant Science
2017 8

Genetic Variability and Interrelationship Among Opium and its Alkaloids in Opium Poppy (Papaver Somniferum L.)
Euphytica
2006 150:1-2

Genome wide association mapping of agro-morphological traits among a diverse collection of finger millet (Eleusine coracana L.) genotypes using SNP markers
PLOS ONE
2018 13:8

Population structure and association mapping studies for yield-related traits in Maize (Zea mays L.)
Current Plant Biology
2019

Quantitative genetic analysis of agronomic and morphological traits in sorghum, Sorghum bicolor
Frontiers in Plant Science
2015 6

Genetic analysis of disease resistance againstXanthomonas campestrispv.moriin mulberry (Morusspp.) and identification of germplasm with high resistance
Archives Of Phytopathology And Plant Protection
2009 42:3

Study of androgenesis and spontaneous chromosome doubling in barley (Hordeum vulgareL.) genotypes using isolated microspore culture
Acta Agronomica Hungarica
2009 57:2

Genetic variability in nigella (Nigella sativa L.)
THE ASIAN JOURNAL OF HORTICULTURE
2018 13:1

Variability, heritability and genetic advance in mulberry (<i>Morus</i> spp.) for growth and yield attributes
Agricultural Sciences
2012 03:02

Variability, Interrelationship, and Path Analysis for Yield Improvement in Luffa
International Journal of Vegetable Science
2013 19:4

Genetic variability, heritability and expected genetic advance of yield and yield related traits in common bean genotypes (Phaseolus vulgaris L.) at Abaya and Yabello, Southern Ethiopia
African Journal of Biotechnology
2018 17:31

Genetic variability and interrelationships of phenological, physicochemical and cooking quality traits in chickpea
Plant Genetic Resources
2012 10:03

Association and Genetic Assessment in Okra
International Journal of Vegetable Science
2015 21:3

Genetic diversity, population structure and association analysis in linseed (Linum usitatissimum L.)
Physiology and Molecular Biology of Plants
2017 23:1

Multivariate approach to identify and characterize bread wheat (Triticum aestivum) germplasm for waterlogging tolerance in India
Field Crops Research
2018 221

Genetic diversity in the barnyard millet (Echinochola frumentacea) germplasms revealed by morphological traits and simple sequence repeat markers
Current Plant Biology
2018 14

Study of Harvest Index and Genetic Variability in White Jute (Corchorus capsularis) Germplasm
Journal of Biological Sciences
2002 2:6

Genetic analysis of yield and quantitative traits in pigeonpea (Cajanus cajan L. Millsp.)
Euphytica
2012 186:3

Envirotyping for deciphering environmental impacts on crop plants
Theoretical and Applied Genetics
2016 129:4

Recurrent irradiation for oat breeding
Radiation Botany
1965 5:5

Grain and Food Quality Traits of Some Indigenous Medicinal Rice Cultivars of Manipur, India
International Journal of Food Properties
2010 13:6

Variance components and heritability of yield and yield-related traits in tepary bean (Phaseolus acutifolius)
South African Journal of Plant and Soil
2019 36:2

Studies on some genetic parameters of rice (Oryza sativa L.)
Theoretical and Applied Genetics
1974 44:4

Genetic variability studies of Valencia groundnut varieties for late leaf spot (Phaeoisariopsis personata) resistance
African Journal of Plant Science
2015 9:8

First results on evaluation of Arundo donax L. clones collected in Southern Italy
Industrial Crops and Products
2006 23:2

Partition of Photosynthates and Energy Production in Different Flax Cultivars
Journal of Natural Fibers
2005 1:4

A Study on Genetic Variability, Character Association and Path Co-Efficient Analysis on Morphological and Yield Attributing Characters of Taro [Colocasia esculenta (L.) Schott]
American Journal of Plant Sciences
2016 07:03

Estimation, interrelationships and repeatability of genetic variability parameters in spring safflower using multi-environment trial data
Euphytica
2009 165:2

Variability of yield determining components in winter rapeseed (Brassica napus L.) and their correlation with seed yield
Genetika
2011 43:1

Genetic variability, heritability and genetic advance in rice (Oryza sativa L.)
ASIAN JOURNAL OF ENVIRONMENTAL SCIENCE
2015 10:1

Improving pedigree selection in applied breeding of barley populations
Cereal Research Communications
2019 47:1

Genetic parameter analysis in M1 and M2 generation of Rathu Heenati rice (Oryza sativa L.) variety
AGRICULTURE UPDATE
2017 12:Special-4

Genetic variability in agronomic traits and associations in sorghum [(Sorghum bicolor (L.) Moench)] genotypes at intermediate agro-ecology sorghum growing areas of Ethiopia
African Journal of Agricultural Research
2018 13:49

Quantitative genetics of sugarcane
Theoretical and Applied Genetics
1968 38:8

1960 12

Genetic Variability, Heritability and Genetic Advance of Some Haricot Bean (Phaseolus vulgaris L.) Varieties at Bench-Maji Zone, Southwest Ethiopia
Asian Journal of Crop Science
2017 9:4

Simultaneous Selection for Fodder and Grain Yield in Sorghum
Journal of Biological Sciences
2001 1:5

Inheritance and combining ability study on drought tolerance and grain yield among early maturing inbred lines of maize (Zea mays L.)
Journal of Plant Breeding and Crop Science
2018 10:6

Broad sense heritability and genetic advance for grain yield and yield components of chickpea (Cicer arietinum L.) genotypes in western Ethiopia
International Journal of Genetics and Molecular Biology
2017 9:4

Possibilidade de seleção recorrente para aumento do teor de óleo em soja com a utilização da macho-esterilidade genética e da espectroscopia de ressonância nuclear magnética
Bragantia
1989 48:2

Genetic variation of fruit, seed, and seedling characteristics among 11 populations of white jabon in Indonesia
Forest Science and Technology
2016 12:1

The Genetic Variability of Floral and Agronomic Characteristics of Newly-Bred Cytoplasmic Male Sterile Rice
Agriculture
2018 8:5

Genetic analysis for growth and wood parameters in progenies of different clones of Populus deltoides Bartr. ex. Marsh
Journal of the Indian Academy of Wood Science
2014 11:2

Genetic variability, associations, and path analysis of chemical and morphological traits in Indian ginseng [Withania somnifera (L.) Dunal] for selection of higher yielding genotypes
Journal of Ginseng Research
2018 42:2

Role of natural enemies, climatic factors and performance genotypes on regulating pests and establishment of canola in Egypt
The Journal of Basic & Applied Zoology
2013 66:1

Genetic mapping of QTLs affecting productivity and plant architecture in a full-sib cross from non-inbred parents in Cassava (Manihot esculenta Crantz)
Theoretical and Applied Genetics
2003 107:8

Evaluation of F2 intergeneric population of papaya (Carica papaya L.) for resistance to papaya ringspot virus (PRSV)
Scientia Horticulturae
2013 158

Genetic Variation for Biomass and Related

Morphological Traits in Cup Plant (<i>Silphium perfoliatum</i> L.)
American Journal of Plant Sciences
2015 06:08

Genetic Variability and Correlation Coefficients of Major Traits in Early Maturing Rice under Rainfed Lowland Environments of Nepal
Advances in Agriculture
2019 2019

Genetic variability, divergence, correlation and path analysis in Foeniculum vulgareMill. germplasm
ASIAN JOURNAL OF BIO SCIENCE
2017 12:2

Evaluation of durum wheat experimental lines under different climate and water regime conditions of Iran
Crop and Pasture Science
2011 62:2

Genetic Diversity for Growth and Yield Traits in Bitter Gourd
International Journal of Vegetable Science
2016 22:5

Genetic variability and inter-relationship of some quantitative characters in safflower
The Journal of Agricultural Science
1974 83:02

Identification of putative candidate genes for red rot resistance in sugarcane (Saccharum species hybrid) using LD-based association mapping
Molecular Genetics and Genomics
2016 291:3

Variability in cone, seed and seedling characteristics of Pinus kesiya Royle ex. Gordon
Journal of Forestry Research
2015 26:2

GENETIC VARIABILITY, HERITABILITY AND GENETIC ADVANCE FOR YIELD AND QUALITY TRAITS IN M2-4 GENERATIONS OF BREAD WHEAT (Triticum aestivum L.) GENOTYPES
Turkish Journal Of Field Crops
2018

Strategies for overcoming genotypic limitations of in vitro regeneration and determination of genetic components of variability of plant regeneration traits in sorghum
Plant Cell, Tissue and Organ Culture
2006 86:3

Studies on direct selection parameters for seed yield and its component traits in pigeonpea [Cajanus cajan (L.) Millsp.]
African Journal of Agricultural Research
2015 10:6

Agro-morphological variation in “Jhinuwa” rice landraces (Oryza sativa L.) of Nepal
Genetic Resources and Crop Evolution
2013 60:8

Correlation, path coefficient analysis and heritability of grain yield components in pearl millet (Pennisetum glaucum (L.) R. Br.) parental lines
Journal of Plant Breeding and Crop Science
2015 7:2

Variability in growth characteristics for different genotypes of Eucalyptus tereticornis (SM.)
Journal of Forestry Research
2010 21:4

Developing Some Promising Lines Resistant to Pyricularia grisea Derived from Egyptian and American Rice Varieties (Oryza sativia L.)
Plant Pathology Journal
2018 17:1

Nature and magnitude of genetic variability and diversity analysis of Indian turmeric accessions using agro-morphological

descriptors
Canadian Journal of Plant Science
2016 96:3

Variability, Heritability, Genetic Advance and Relationships of Yield and Yield Contributing Characters in Dry Bean (Phaseolus vulgaris L.)
Journal of Biological Sciences
2004 4:2

Genetic analysis of growth and wood variations in Leucaena leucocephala (Lam.) de Wit.
Journal of Forestry Research
2013 24:3

Induced quantitative mutation in rice
Radiation Botany
1973 13:5

Variability, heritability and character association analysis of chemoagronomic traits in Rauwolfia serpentina
Euphytica
2014 200:2

Genetic Divergence and Heritability of 42 Coloured Upland Rice Genotypes (Oryzasativa) as Revealed by Microsatellites Marker and Agro-Morphological Traits
PLOS ONE
2015 10:9

Molecular Analysis of Drought Tolerance in Guava Based on In Vitro PEG Evaluation
Tropical Plant Biology
2016 9:2

Variability and Inter-Relations Among Characters in Indigenous Grain Sorghums of the Sudan
East African Agricultural and Forestry Journal
1975 41:2

Using unsupervised learning techniques to assess interactions among complex traits in soybeans
Euphytica
2017 213:8

Domestication of jute mallow (Corchorus olitorius L.): ethnobotany, production constraints and phenomics of local cultivars in Ghana
Genetic Resources and Crop Evolution
2017 64:6

Genetic variability, character association and path coefficient analysis of quantitative traits in Viginia bunch varieties of ground nut. Indian Journal of Agricultural Science, 56:515-518. Falconer DS, Trudy FC Mackay (1996). Estimates of genetic and environmental variability in soybeans. Agronomy Journal, 47:314-318. Johnson HW, Robinson HF, Comstock RE (1955b). Estimates of genetic and environmental variability in soybeans. Agronomy Journal, 47: 314-318. Kassahun A (2011). Variability for yield, yield related traits, protein content and

association among traits of sorghum (sorghum bicolor (L) moench varieties in Wollo, Ethiopia, Msc thesis, Haramaya university, Haramaya, Ethiopia. Khan SA (2013). Genetic Variability and Heritability Estimates in F2 wheat Genotypes. Genetic and Environmental Sources of Variation in the Autogenous Chemical Defense of a Leaf Beetle. Y. Triponez & R. E. Naisbit genetic and environmental sources of variation in survival on ... Abstract Environmental variation in food resources modifies performance of herbivores, in addition to genetic variation and maternal effects. In marine benthic habitats, eutrophication may modify herbivores' diets by changing host species composition or nutritional quality of algae for herbivores. A nested full-sibling/half-sibling breeding design enabled calculation of the estimates of heritability (Falconer and MacKay 1996) of size and intermolt duration as well as evaluation of maternal effects. Each male (n =22) was allowed to fertilize four females, one from every treatment group.