

Self-fertility in alfalfa after chemical mutagen treatment

Seeds of "Augune II" were treated with 0.03% EI, 0.1% EMS, 0.05% NMH and 0.03% DMS. Self-fertile plants selected in M_2 were further assessed in M_3 and M_4 . Some selected lines had a seed production of 65 g/plant. One mutant had self-tripping flowers, another one was self-fertile and cleistogamous. Wide variation was also found in green and dry matter yield and in content of haemolytic saponins.

From: KYARSHULENE, Z.A. (Litovskii N.I. Institut Zemledeliya, Dotnuva, Lithuanian SSR). Sbornik Nauchnykh Trudov po Prikladnoi Botanike, Genetike i Selektin 103 (1986) 19-22; PBA 58 No.5 (1988) 868.

The Swedish mutant barley collection

The Swedish mutation research programme in barley began about 50 years ago and has mainly been carried out at Svalöv in co-operation with the Institute of Genetics at the University of Lund. The collection has been produced from different Swedish high-yielding spring barley varieties, using the following mutagens: X-rays, neutrons, several organic chemical compounds such as ethyleneimine, several sulfonate derivatives and the inorganic chemical mutagen sodium azide.

Nearly 10,000 barley mutants are stored in the Nordic Gene Bank and documented in databases developed by Udda Lundquist, Svalöv AB. The collection consists of the following nine categories with 94 different types of mutants:

1. Mutants with changes in the spike and spikelets
2. Changes in culm length and culm composition
3. Changes in growth types
4. Physiological mutants
5. Changes in awns
6. Changes in seed size and shape
7. Changes in leaf blades
8. Changes in anthocyanin and colour
9. Resistance to barley powdery mildew

Barley is one of the most thoroughly investigated crops in terms of induction of mutations and mutation genetics. So far, about half of the mutants stored at the Nordic Gene Bank, have been analysed genetically; They constitute, however, only a minority of the 94 different mutant types. The genetic analyses have given valuable insights into the mutation process but also into the genetic architecture of various characters. A number of mutants of two-row barley have been registered and commercially released. One of the earliest released, Mari, an early maturing, daylength neutral, straw stiff mutant, is still grown in Iceland.

The Swedish mutation material has been used in Sweden, but also in other countries, such as Denmark, Germany, and USA, for various studies providing a better understanding of the barley genome. The collection will be immensely valuable for future molecular genetical analyses of clone mutant genes.

From: The Nordic Barley Catalogue 1989. ISBN 91-87814-00-5. Issued by the Nordic Gene Bank for Agricultural and Horticultural Plants, P.O. Box 41, S-230 53 Alnarp, Sweden.

LIST OF CULTIVARS

The Plant Breeding and Genetics Section of the Joint FAO/IAEA Division undertakes the collection and dissemination of information on commercially used agricultural and horticultural cultivars developed through the utilization of induced mutations. This list does not claim to be comprehensive. Its content is strictly based on information transmitted by the breeders themselves and/or other institutions involved. Listing of a cultivar does not imply its recommendation by FAO/IAEA.

Name of new cultivar	Place and date of release (or approval) and name of principal worker and institute	Mutagenic treatment [parent variety] or cross with <u>mutant</u> /with <u>mutant</u> <u>cross derived variety</u>	Main improved attributes of cultivar
<u><i>Alopecurus pratensis</i> L.</u> (meadow foxtail)			
Alko	FRG, 1983 U. Simon, Ph. Berner Saatsucht von Schmieder Steinach/Straubing	Gamma rays seeds, 1959	Improved seed retention
Limosa	FRG, 1984 U. Simon Institute for Agronomy and Plant Breeding University Giessen	Gamma rays seeds, 1959	Improved seed retention
<u><i>Arachis hypogaea</i> L.</u> (groundnut)			
Luhua 6	China, 1986 Qiu Qingshu Institute of Peanut Shandong Acad. Agric. Sci.	Gamma rays 24 kR seed, 1971 [Baisha 1016]	10 d earlier than parent variety yield 13.6% higher

Brassica juncea (L.) Czern and Coss. (oriental mustard)

Shambal (BAU-M/248)	Bangladesh, 1984 L. Rahman Md. Shah-E-Alam M.A. Quddus Bangladesh Agric. Univ. Mymensingh	EMS 0.64% seeds, 1975 [BAU-M/14]	Short plant type, bold seed size; 1988 grown on 7000 ha = 10% of <u>B. juncea</u> area
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Chrysanthemum morifolium (chrysanthemum)

Golden Cremon	Thailand, 1987 Ch. Buranakanit O. Sahavacharin Dept. Horticulture Faculty of Agriculture Kasetsart University Bangkok	Gamma rays 1 krad tissue culture, 1986 [Cremon]	Golden yellow ray florets
KU 1	Thailand, 1988 S. Eiamfang O. Sahavacharin Dept. Horticulture Faculty of Agriculture Kasetsart University Bangkok	Gamma rays 1.5 krad tissue culture, 1986 [Hangzhou]	Larger flower, more disease tolerance

Citrus reticulata Blanco (mandarin)

Hongju 420	China, 1986 Zhou Yubin Zhou Jiangxing Zhou Kailong a.o. Citrus Research Institute Chinese Acad. Agric. Sci. Beibei, Chongqing	⁶⁰ Co gamma rays seeds, 1983 [Dahongpao]	Only few seeds (3-4 instead of 13-14), cold tolerant
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Corchorus capsularis L. (white jute)

Hyb 'C' (Padma)	India, 1983 D.P. Singh Jute Agric. Research Institute Barrackpore W.P.	<u>JRC-6165</u> x JRC-412 (JRC-6165 = mutant of JRC-919 induced by 90 kR X-rays, dry seeds)	Tolerance to water logging, less affected by diseases and pests
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Name of new cultivar	Place and date of release (or approval) and name of principal worker and institute	Mutagenic treatment [parent variety] or cross with <u>mutant</u> /with <u>mutant</u> <u>cross derived variety</u>	Main improved attributes of cultivar
<u>Dianthus caryophyllus L.</u> (carnation)			
Chaichoompon	Thailand, 1983 Ch. Suriyasak O. Sahavacharin Dept. Horticulture Faculty of Agriculture Kasetsart University Bangkok	Gamma rays 1 krad tissue culture, 1981 [White Sim]	White with pink streaks on petal
<u>Festuca pratensis Huds.</u> (meadow fescue)			
Fesko	FRG, 1982 Ph. Berner Saatzucht v. Schmieder Steinach/Straubing	Gamma rays seeds, 1961	Improved seed retention
Lifesta	FRG, 1981 E. Lütke Entrup G. Michelmann Deutsche Saatveredelung Lipstadt	Gamma rays seeds, 1961	Improved seed retention
Liforte	FRG, 1984 G. Michelmann E. Lütke Entrup Deutsche Saatveredelung Lipstadt	Gamma rays seeds, 1961	Improved seed retention
<u>Gladiolus sp.</u> (gladiolus)			
Red Reflection	The Netherlands, 1988 A.G. Bakker Ens	X-rays 40-70 Gy corms, 1979 [Peter Pears]	Deeper orange flower colour with yellowish throat

Shobha	India, 1988 S.P.S. Raghava et al. Div. of Ornamental Crops Indian Inst. of Hortic. Res. Bangalore 560080	Gamma rays 1 krad [Wild Rose]	Change of flower colour from "Roseine Purple" to "Shell Pink"
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Glycine max (soybean)

Dorado	GDR, 1988 G.W. Krausse Inst. f. Züchtungsforschung Akad. d. LWW Quedlinburg	NMH lmm seeds, 1979 [Fiskeby V]	<u>Higher grain yield, longer stem</u> <u>higher insertion of lowest pod</u> early ripening
Fengdou 1	China, 1988 Xifeng Research Inst. and Inst. Appl. Atomic Energy Liaoning Acad. Agric. Sci. Shenyang	⁶⁰ Co gamma rays 20 kR F ₂ seeds of [(Qunxuan 1 x Qun Ying Dou) x 5621]	110-120 d till maturity
Liaonong 1	China, 1988 Inst. Appl. Atomic Energy Liaoning Acad. Agric. Sci. Shenyang	⁶⁰ Co gamma rays 18 kR F ₂ seeds of [Heinong 11 x Tiefeng 9]	7-10 d earlier, 10% higher yield than check cv "Heihe 3"

Gossypium hirsutum L. (cotton)

Chuanpei 1	China, 1982 Zhang Fengxin et al. Dept. of Agronomy South West Agric. Univ. Chongqing	Gamma rays seeds, 1972 [Dongtin 1]	8 d earlier maturity, elongated upper internode, increased boll weight and lint yield
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Hordeum vulgare (barley)

Anna Abed	Denmark, 1979 K. Vive Abed Planteavlstation 4920 Sollested	Cross with <u>Midas</u>	<u>Stiffer straw</u>
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<u>Hordeum vulgare</u> (barley) continuation			
Ayr	UK, 1986 Cereal and Legume Genetics Department Scottish Crop Res. Inst. Invergowrie Dundee DD2 5DA	(<u>Goldmarker</u> x Athos) x (<u>Goldmarker</u> x Magnum)	<u>Short culm</u> , high yield, good disease resistance
Beauly	UK, 1983 Cereal and Legume Genetics Department Scottish Crop Res. Inst. Invergowrie Dundee DD2 5DA	<u>Trumpf</u> x Georgie	Short culm, high yield, early maturity; good disease resistance
Cromarty	UK, 1983 Cereal and Legume Genetics Department Scottish Crop Res. Inst. Invergowrie Dundee DD2 5DA	Aramir x <u>Trumpf</u>	<u>Short culm</u> , high yield; good disease resistance
Donan	UK, 1983 Cereal and Legume Genetics Department Scottish Crop Res. Inst. Invergowrie Dundee DD2 5DA	Ark Royal x <u>Trumpf</u>	<u>Short culm</u> , high yield; good malting quality and disease resistance
Esk	UK, 1985 Cereal and Legume Genetics Department Scottish Crop Res. Inst. Invergowrie Dundee DD2 5DA	(<u>Goldmarker</u> x Athos) x (<u>Goldmarker</u> x Magnum)	<u>Short culm</u> , <u>early maturity</u> high yield, medium malting quality, good disease resistance

Nairn	UK, 1983 Cereal and Legume Genetics Department Scottish Crop Res. Inst. Invergowrie Dundee DD2 5DA	<u>Trumpf</u> x HB 855/467/8	<u>short culm</u> , early maturity, good malting quality and disease resistance
Novum	CSSR, 1988 J. Kosak SLOVOSKIVO Breed. Station Sladkovicovo	SK 1429 x <u>Krystal</u>	High yield, stable yield, re- sistant to lodging and to leaf diseases
Profit	CSSR, 1988 F. Slaby OSEVA Breed. Station Cejc	<u>Koral</u> x (H357 x (Jubilane x Jantar))	High yield, resistant to lodging
Tyne	UK, 1987 Cereal and Legume Genetics Department Scottish Crop Res. Inst. Invergowrie Dundee DD2 5DA	(<u>Goldmarker</u> x Athos) x (<u>Goldmarker</u> x Magnum)	<u>Short culm</u> , <u>early maturity</u> medium malting quality; good disease resistance
Vega Abed	Denmark, 1977 Abed Planteavlstation 4920 Sollested	Lofa Abed x <u>Kristina</u>	<u>Stiffer straw</u> general good disease resistance
<u>Hyacinthus sp.</u> (hyacinth)			
Orion	The Netherlands, 1987 J.M. van Tuyl Inst. of Hortic. Plant Breeding Wageningen	X-rays 2.5 Gy bulbs before scooping [Jan Bos]	Flower colour orange instead of "Spiraea red"
<u>Oryza sativa L.</u> (rice)			
Hari (TR-RNR-21)	India, 1987 P. Narahari Nuclear Agric. Division BARC Trombay Bombay 400 085	IR8 x <u>TR5</u> (TR5 dwarf mutant of salt tolerant variety SR-26-B induced by fast neutron irradiation	Short culm, higher yield

Name of new cultivar	Place and date of release (or approval) and name of principal worker and institute	Mutagenic treatment [parent variety] or cross with mutant/with mutant cross derived variety	Main improved attributes of cultivar
IRAT 104	Côte d'Ivoire, 1983 M. Jacquot J. Dallard IRAT/IDESSA	<u>IRAT 13</u> x Moroberekan	Taller than IRAT 13; high yield
IRAT 112	Côte d'Ivoire, 1983 Togo, 1986 Haiti, 1987 M. Jacquot J. Dallard IRAT/IDESSA	<u>IRAT 13</u> x Dourado Precoce	Higher tillering, earlier maturing than IRAT 13 recommended by WARDA for upland conditions in Côte d'Ivoire and Burkina Faso
IRAT 144	Burkina Faso, 1978 Côte d'Ivoire, 1984 M. Jacquot C. Poisson IRAT/IDESSA	IRAT 10 x <u>IRAT 13</u>	Medium tall, high yield 103 d till maturity, lodging resistant
IRAT 170	Côte d'Ivoire, 1984 M. Jacquot, M. Arraudeau G. Clement, C. Poisson IRAT/IDESSA	<u>IRAT 13</u> x Palawan	Medium tall, high tillering 124 d till maturity; good cooking quality; recommended also in Nigeria
IRAT 177	Brazil, 1988 D. Dechanet IRAT Guayana	Spontaneous mutant selected from <u>IRAT 79</u>	Taller, high tillering
IRAT 216 (IDSA 6)	Côte D'Ivoire, 1985 M. Jacquot G. Clement C. Poisson IRAT/IDESSA	Columbia 1 x <u>M 312A</u> (M 312A induced by gamma rays)	Good adaptation to wetland rice culture resistance to <u>Pyricularia</u> tolerance to flooding

Phaseolus vulgaris L. (bean)

Mitchell	Canada, 1986 S.J. Park J.W. Aylesworth Agric. Canada Research Station Harrow, Ontario	<u>Seafarer</u> x Tuscola	
Carioca Arbustivo Precoce 1070 (CAP-1070)	Brazil, 1986 A. Tulmann Neto CENA Piracicaba S.P. J. Alberini F.T. Sementes e Pesquisa Pont a Grossa, Parana	Gamma rays 32 krad [Carioca]	Bush type, 5-14 d earlier maturity

Rhododendron obtusum (Japanese azalea)

Odilia	The Netherlands A.S. Bouma Research Station for Nursery Stock Boskoop	X-rays 20-60 Gy plants, 1969 [Silvester]	Rosy-pink flower colour instead of pink; one week earlier forcable than "Silvester"
Stefan	The Netherlands A.S. Bouma Research Station for Nursery Stock Boskoop	X-rays 20-60 Gy plants, 1969 [Silvester]	Salmon-pink flower colour instead of pink; one week earlier forcable than "Silvester"

Vigna unguiculata (L.) Walp. (cowpea)

Uneca-Gama	Costa Rica, 1986 W. Navarro Alvarez Secc. Genetica Vegetal Universidad Nacional Heredia	Gamma rays 10 krad [Centa]	high yield
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<u>Ziziphus mauritiana Lam</u> (Indian jujube, ber)			
Dao tien	Vietnam, 1986 V.T. Hoang N.V. Tuynh Food Crops Research Institute Tu Loc, Hai Hung	MNH 0.02-0.04%, 12 h pregermin. seeds [Thien Phien]	Harvestable 1 m earlier (Jan instead of Feb), 2 crops/year (second harvest November); fruit size increased (from 20 to 25 g) better taste (peach flavour)
Ma hong	Vietnam, 1986 V.T. Hoang N.V. Tuynh Food Crops Research Institute Tu Loc, Hai Hung	MNH 0.02%, 12 h pregermin. seeds [Gia Loc]	Maintained useful traits of "Gia Loc" such as early maturity, 2 crops/y (harvest December and August). Altered characters: fruits round instead of oval, pink rose instead of yellow, sweeter, more stable fruit yield

Corrections

Abelmoschus esculentus (L.) Moenck (lady's finger, okra)

MDU 1 (instead of MDU 2) (ref. MBNL No. 33)	India, 1978 K.S. Jahangir V. Thandapani G. Sountharapandian P. Chandrasekaran Agric. College and Research Institute, Madurai	DES, 0.04% [Pusa Sawani]	light green fruits, less crude fibre (12.3%), higher yield (30%), field tolerant to yellow mosaic, cultivated on ca. 5000 ha.
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Chrysanthemum sp.

Kumkum (ref. MBNL No. 31)	India, 1982 S.K. Datta B.K. Banerji H.M. Jungran National Bot. Res. Inst. Lucknow 226001	(rest unchanged)	
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NEW PUBLICATIONS

Radiation Mutagenesis in Wheat

P.G. Savov

ISBN 81 85005605

Agricole Publishing Academy New Delhi 110024. 1989, 312 p., US \$36

Plant Biotechnology: In vitro selection upon cells and tissue cultures

1987 Plant Science Lectures Series at Iowa State University.

The topics covered in this publication are:

1. Selection for amino acid overproducer mutants in maize: Valine selection.
2. Agrobacterium - mediated gene transfer to plants; engineering tolerance to glyphosate.
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5. Science in the art of plant regeneration from cultured cells: An essay and a proposal for a conceptual framework.
6. Sorghum cell culture: Somaclonal variation/screening.
7. In vitro selection with plant cell and tissue cultures. An overview.

Copies can be purchased for \$8.00 by prepaid orders from Darlene Fleig, Agronomy Department, Iowa State University, Ames, IA 50011. Make checks payable to "Iowa State University". Orders from outside the USA should be prepaid by international money order.

Proceedings 5th International Lupin Conference

5-8 July 1988, Poznan (Poland)

Edit. T. Twardowski

c/o Institute of Bioorganic Chemistry, Polish Academy of Sciences, 31704 Poznan, Noskowskiego 12 Poland, 735 pp.

New Frontiers in Breeding Researches

Proceedings of 5th SABRAO Congress, Bangkok 1985.

Edit. B. Napompeth, S. Subhadrabandhu

Publ.: Faculty of Agriculture, Kasetsart University, Bangkok, Thailand, 1986, 931 pp.

Plant Breeding and Genetic Engineering

Proc. of SABRAO Symposium, Kuala Lumpur, Malaysia, 30.11 - 3.12.1987

Edit. A.H. Zakri

Publ.: SABRAO, c/o Department of Genetics, University Kebangsaan Malaysia, 43600 UKM Bangi, Selangor, Darul Elisan, Malaysia. 1988, 384 pp.

Plant Domestication by Induced Mutations

Proc. of FAO/IAEA Advisory Group Meeting on the Possible Use of Mutation Breeding for Rapid Domestication of New Crop Plants. Vienna, 17-21 Nov. 1986

IAEA, 1989, 189 pp., 500 AS. ISBN 92-0-111089-8

Plant Cell and Tissue Culture of Economically Important Plants

Proc. of a national symposium, July 1986

Edit. G.M. Reddy

Dept. of Genetics, Osmania University, Hyderabad, 500007 AD. India 1987, 462 pp. 300 Rs

FUTURE EVENTS

1989

12-15 October Genetics and Molecular Biology of Arabidopsis (Indiana Molecular Biol. Symposium IV), Indiana State University, Bloomington

Contact: P. Percival
Inst. for Molecular and Cellular Biology,
Jordan Hall 322A
Indiana University
Bloomington, IN 47405

1990

2-5 June 4th International Conference of Arabidopsis Research
"Contributions to Molecular Genetic, Biochemistry, and the Cellular and Developmental Biology of Plants", Vienna (Austria)

Contact: K. Peuker
Institute of Botany, University of Vienna
Rennweg 14
A-1030 Vienna, Austria

LAST BUT NOT LEAST

Please submit your contribution to the Newsletter by 1 June and 1 December of each year.

Authors are kindly requested to take into account that the readers want to learn about new findings and new methods but would also like to see the most relevant data on which statements and conclusions are based. Conclusions should be precise and distinguish facts from speculation. The length of contributions should not exceed 2-3 typewritten pages including tables. We regret that photographs cannot be accepted for technical reasons. References to publications containing a more detailed description of methods or evaluation of findings are welcome but should generally be limited to one or two.

Alexander MICKE

Mutation Breeding Newsletter
Joint FAO/IAEA Division of Nuclear Techniques
in Food and Agriculture
International Atomic Energy Agency
Wagramerstrasse 5, P.O. Box 100
A-1400 Vienna, Austria

Printed by the IAEA in Austria
August 1989

89-03238