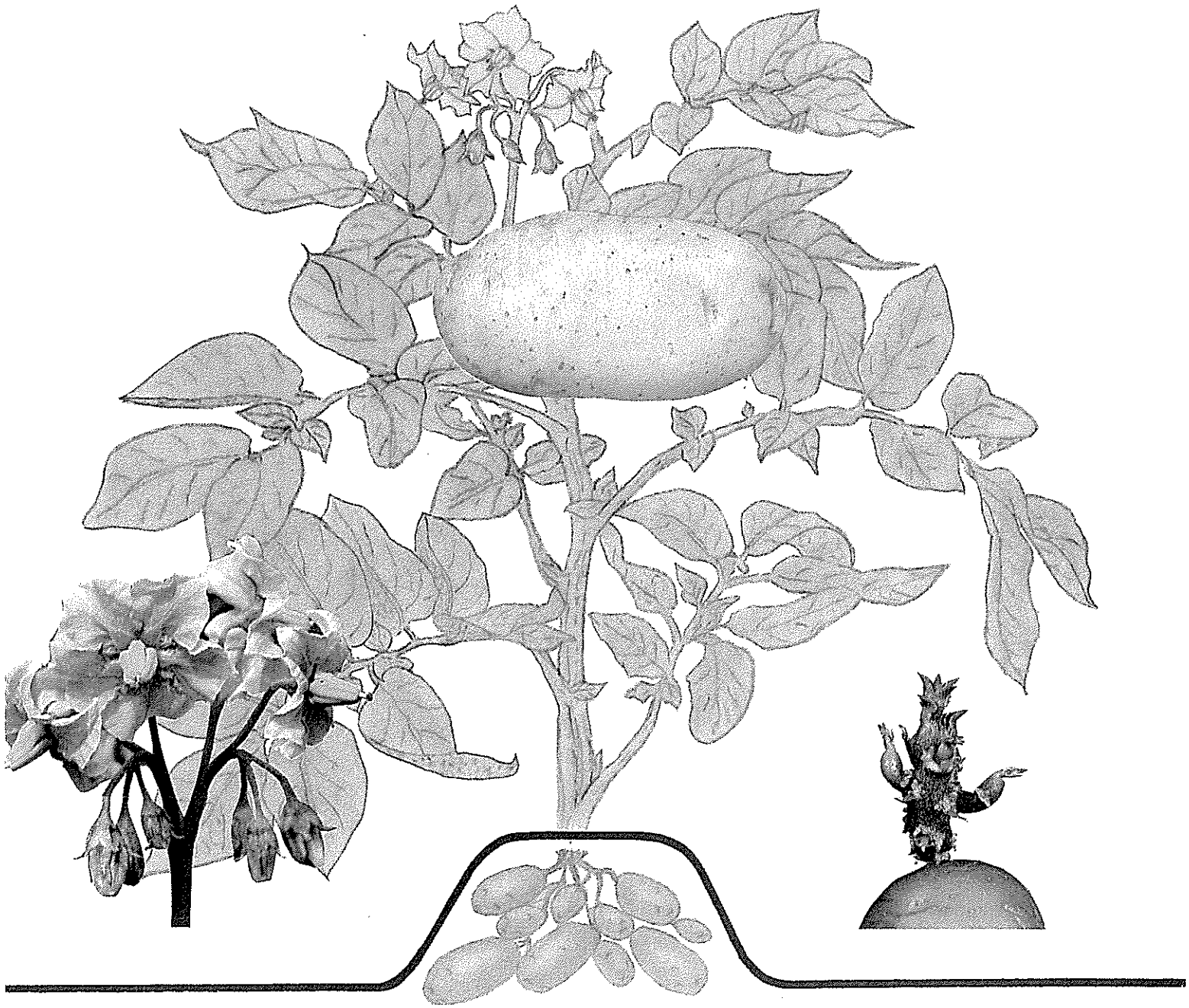
4



POTATO-VARIETY

DESCRIPTORS

AGPG: IBPGR/85/160
EUR 8354 en 4
October 1985

INTERNATIONAL BOARD FOR PLANT GENETIC RESOURCES

COMMISSION OF EUROPEAN COMMUNITIES:

COMMITTEE OF PLANT PRODUCTIVITY

MINIMUM LIST OF CHARACTERISTICS OF POTATO VARIETIES

Solanum tuberosum ssp tuberosum

Editors

G.R. Mackay

M.J. Hijink

G. Mix

CEC Secretariat, Brussels, 1985

IBPGR Secretariat, Rome, 1985

Design of cover: Ing. B. Ros, RIVRO, Wageningen
Ries van Lent, RIVRO, Wageningen

Published for the Commission of the European Communities,
Directorate-General Information Market and Innovation,
Luxembourg and for the IBPGR, Rome.

ISBN 90 6605 122 1

In 1974 the Council of Ministers of the European Communities established a Standing Committee on Agricultural Research to advise the Commission on a programme of Agricultural Research.

The first programme started in 1975, while a second programme was launched in 1979 for the five year period 1979-1983.

The Standing Committee on Agricûltural Research had advised the Commission on both programmes. Within this framework a programme on resistance breeding and use of genebanks has been set up as one of 10 subjects. This programme (with a limited budget) is managed by a programme committee in which the ten member countries are represented by their nominees, one per country. The programme committee started work in 1978 by selecting priorities for crops and subjects. Several working groups have been set up to prepare descriptor lists as a basis for future work.

In 1984 a third research programme for the five year period 1984-1988 was started. The new programme committee on plant productivity will bring the work of the former programme committee to an end.

CEC-Programme Committee on Disease Resistance Breeding and Use of Genebanks
Second Programme on Agricultural Research of the CEC.

CEC-Programme Committee on Plant Productivity
Third Programme on Agricultural Research of the CEC.

rue de la Loi 200
1040 Brussels, Belgium

The International Board for Plant Genetic Resources (IBPGR) is an autonomous, international , scientific organization under the aegis of the Consultative Group on International Agricultural Research (CGIAR). The IBPGR, which was established by the CGIAR in 1974, is composed of its Chairman and 15 members; its Executive Secretariat is provided by the Food and Agriculture Organization of the United Nations. The basic function of the IBPGR, as defined by the Consultative Group, is to promote an international network of genetic resources centres to further the collection, conservation, documentation, evaluation and use of plant germplasm and thereby contribute to raising the standard of living and welfare of people throughout the world. The Consultative Group mobilizes financial support from its members to meet the budgetary requirements of the Board.

IBPGR Executive Secretariat
Crop Genetic Resources Centre
Plant Production and Protection Division
Food and Agriculture Organization of the United Nations
Via delle Terme di Caracalla, 00100 Rome, Italy

CONTENTS

PREFACE

This potato descriptor list was initiated for the benefit of breeders and developed with full support from the Commission of the European Communities (CEC) Programme Committee for Plant Resistance Breeding and the use of Genebanks and the Plant Productivity Committee following consultation with IBPGR. The UPOV descriptor list for potatoes has been referred to and common systems used where possible.

This descriptor list has not been prepared entirely to the IBPGR standard format. The IBPGR encourages the collection of data on four categories: Accession, Collection, Characterization and Preliminary Evaluation. The IBPGR endorses the information in categories 1-5 inc. herein, as the minimum that ideally should be available for any one variety. However, in evaluating reactions to pests and diseases, whereas it is IBPGR standard procedure to score on a 1 to 9 scale of increasing susceptibility historically potato breeders have tended to score on scales of increasing resistance. It was the unanimous decision of the EEC Workshop that in order to maintain consistency with previous and present agricultural practise (e.g. National Institute of Agricultural Botany Recommended List in U.K. and Rassenlijst in the Netherlands) and the view that the 1 to 9 scale should, where relevant and possible, reflect increasing desirability that this would be the procedure followed in this document (also for characters - eye depth, maturity).

Although the suggested coding should not be regarded as a definitive scheme, this format has the backing of IBPGR. The descriptor list given here provides an international minimum format for varieties. This could form the basis of a more extensive list to include primitive cultivars and wild species, which could produce a rapid, reliable and efficient means for information storage, retrieval and communication. This could greatly assist the utilisation of germplasm throughout the international plant genetic resources network.

Any suggestions for modifications will be welcomed by the IBPGR Secretariat, Rome and by the editors, especially before encoding new descriptors.

In addition to preparing this descriptor list the CEC Workshop also compiled an inventory of old varieties maintained within the EEC, with information on their health status and sources of origin. Copies are available from the EC Brussels.

October 1985

DESCRIPTOR LIST FOR POTATO VARIETIES

This document was compiled for existing varieties;

Passport data (accession identifiers and information recorded by collectors) and

Characterization data (taxonomic traits used for identification of different species) are reduced to bare minimum, sufficient to enable such information to be traced if so required. Emphasis has been placed on performance characteristics or

Evaluation data such as would be collected and used by plant breeders and evaluators of varieties.

At the time of preparation of this document there are no internationally agreed standard varieties. It is important when using the 1 to 9 scales to ensure that reference is made to the performance of local/national standard varieties used in the same tests or observed in the same conditions; until such time as recognised international standards are agreed. It is important also to specify, preferably by reference to published information, the nature of the test upon which the scores assigned are based.

1. PASSPORT CHARACTERS

1.1	Variety	Variety name and synonyms
1.2	Variant or parentage	Source variety or immediate pedigree
1.3	Country of origin	Name of country
1.4	National Listing	Date of introduction or entry on to National List if relevant

2. PLANT CHARACTERISTICS

2.1	Earliness of foliage maturity	1 = very late 3 = late 5 = intermediate 7 = early 9 = very early
2.2	Growth habit	1 = extremely erect 3 = erect 5 = semi-erect 7 = prostrate 9 = very prostrate
2.3	Foliage cover	1 = very poor (= sparse) 3 = poor 5 = moderate 7 = good 9 = very good (= dense)
2.4	Flower frequency	1 = extremely rare 3 = rare 5 = occassional 7 = frequent 9 = very frequent
2.5	Flower colour	State verbally
2.6	Pollen fertility	1 = very low or sterile 3 = low 5 = moderate 7 = high 9 = very high
2.7	Berry number per plant	1 = extremely rare 3 = rare 5 = occassional 7 = frequent 9 = very frequent

3. TUBER CHARACTERISTICS

3.1	Tuber shape	State verbally
3.2	Skin colour	State verbally
3.3	Eye colour	State verbally
3.4	Light sprout colour	State verbally
3.5	Flesh colour	State verbally
3.6	Eye depth	1 = very deep 3 = deep 5 = medium 7 = shallow 9 = very shallow
3.7	Skin texture	1 = very rough 3 = rough 5 = intermediate 7 = smooth 9 = very smooth
3.8	Dormancy	1 = very short 3 = short 5 = medium 7 = long 9 = very long
3.9	Resistance to external damage	1 = very susceptible 3 = susceptible 5 = moderate 7 = resistant 9 = very resistant
3.10	Resistant to internal bruising	1 = very susceptible 3 = susceptible 5 = moderate 7 = resistant 9 = very resistant

3.11 Storageability

1 = very poor
3 = poor
5 = moderate
7 = good
9 = very good

3.12 Tuber glycoalkaloid

1 = very high
3 = high
5 = moderate
7 = low
9 = very low

4. UTILISATION CHARACTERISTICS

4.1	Cooking type	A = firm (salad type) B = fairly firm (multi-purpose type) C = mealy (floury type) D = very mealy (floury type)
4.2	After cooking blackening	1 = severe 3 = high 5 = medium 7 = low 9 = extremely low
4.3	Frying colour	1 = very dark 3 = dark 5 = medium 7 = pale 9 = very pale
4.4	Crisp suitability	1 = very poor 3 = poor 5 = medium 7 = good 9 = very good
4.5	French fry suitability	1 = very poor 3 = poor 5 = medium 7 = good 9 = very good
4.6	Enzymic browning	1 = severe 3 = high 5 = medium 7 = low 9 = extremely low

4.7	Dry Matter Content	1 = very low 3 = low 5 = medium 7 = high 9 = very high
4.8	Starch content	1 = very low 3 = low 5 = medium 7 = high 9 = very high
4.9	Protein content	1 = very low 3 = low 5 = medium 7 = high 9 = very high

5. TUBERING CHARACTERISTICS

5.1	Yield potential	1 = very low 3 = low 5 = medium 7 = high 9 = very high
5.2	Adaptability	1 = very narrow 3 = narrow 5 = medium 7 = wide 9 = very wide
5.3	Rate of bulking	1 = very slow 3 = slow 5 = medium 7 = fast 9 = very fast
5.4	Tuber number per plant	1 = very few 3 = few 5 = medium 7 = many 9 = very many
5.5	Tuber size	1 = very small 3 = small 5 = medium 7 = large 9 = very large
5.6	Tuber uniformity	1 = very variable 3 = variable 5 = medium 7 = uniform 9 = very uniform

5.7 Secondary growth

1 = very high tendency
3 = high tendency
5 = medium
7 = low tendency
9 = very low tendency

5.8 Hollow heart

1 = very high tendency
3 = high tendency
5 = medium
7 = low tendency
9 = very low tendency

5.9 Growth cracking

1 = very high tendency
3 = high tendency
5 = medium
7 = low tendency
9 = very low tendency

5.10 Tuber greening before harvest

1 = very high tendency
3 = high tendency
5 = medium
7 = low tendency
9 = very low tendency

5.11 Length of stolons

1 = very long
3 = long
5 = medium
7 = short
9 = very short

5.12 Stolon attachment

1 = very strong (= persistent)
3 = strong
5 = medium
7 = loose
9 = very loose

5.13 Internal rust spot

1 = very strong tendency (frequent)
3 = frequent
5 = medium
7 = infrequent
9 = very weak tendency (infrequent)

6. RESISTANCE(S) TO PESTS AND DISEASES*

6.1 FUNGI

6.2 BACTERIA

6.3 VIRUSES

6.4 PESTS

*see page 6, preface second paragraph

6.1 RESISTANCE TO FUNGAL DISEASES

6.1.1	Common scab *Streptomyces scabies*	1 = very low resistance* 3 = low resistance 5 = moderate 7 = high resistance 9 = very high resistance
6.1.2	Dry rot *Fusarium spp.* State verbally species	1 = very low resistance 3 = low resistance 5 = moderate 7 = high resistance 9 = very high resistance
6.1.3	Early blight *Alternaria solani*	1 = very low resistance 3 = low resistance 5 = moderate 7 = high resistance 9 = very high resistance
6.1.4	Fusarium wilt *Fusarium oxysporum*	1 = very low resistance 3 = low resistance 5 = moderate 7 = high resistance 9 = very high resistance
6.1.5	Gangrene *Phoma exigua var. foveata*	1 = very low resistance 3 = low resistance 5 = moderate 7 = high resistance 9 = very high resistance
6.1.6	Late blight on foliage *Phytophthora infestans*	1 = very low resistance 3 = low resistance 5 = moderate 7 = high resistance 9 = very high resistance State if and which R genes present, if known.

*see page 6, preface second paragraph

6.1.7	Late blight on tubers *Phytophthora infestans*	1 = very low resistance 3 = low resistance 5 = moderate 7 = high resistance 9 = very high resistance
6.1.8	Stem cancer *Rhizoctonia solani*	1 = very low resistance 3 = low resistance 5 = moderate 7 = high resistance 9 = very high resistance
6.1.9	Powdery scab *Spongospora subterranea*	1 = very low resistance 3 = low resistance 5 = moderate 7 = high resistance 9 = very high resistance
6.1.10	Wart *Synchytrium endobioticum*	State whether susceptible or field immune and specify race(s)

6.2 RESISTANCE TO BACTERIAL DISEASES

6.2.1	Bacterial soft rot *Erwinia spp.* State verbally species	1 = very low resistance 3 = low resistance 5 = moderate 7 = high resistance 9 = very high resistance
6.2.2	Bacterial wilt *Pseudomonas solanacearum*	1 = very low resistance 3 = low resistance 5 = moderate 7 = high resistance 9 = very high resistance
6.2.3	Blackleg *Erwinia spp.* State verbally species	1 = very low resistance 3 = low resistance 5 = moderate 7 = high resistance 9 = very high resistance
6.2.4	Ring rot *Corynebacterium sepedonicum*	1 = very low resistance 3 = low resistance 5 = moderate 7 = high resistance 9 = very high resistance

6.3 RESISTANCE TO VIRUS DISEASES

6.3.1 Leafroll virus

1 = very low resistance
3 = low resistance
5 = moderate
7 = high resistance
9 = very high resistance

6.3.2 Mop top virus

1 = very low resistance
3 = low resistance
5 = moderate
7 = high resistance
9 = very high resistance

6.3.3 Tobacco rattle virus

1 = very low resistance
3 = low resistance
5 = moderate
7 = high resistance
9 = very high resistance

6.3.4 Virus A

1 = very low resistance
3 = low resistance
5 = moderate
7 = high resistance
9 = very high resistance

and/or

H* = hypersensitive
I = field immune
R = resistant
S = susceptible
T = tolerant

6.3.5 Virus B

1 = very low resistance
3 = low resistance
5 = moderate
7 = high resistance
9 = very high resistance

and/or

H* = hypersensitive
I = field immune
R = resistant
S = susceptible
T = tolerant

* 1 to 9 scale related to field performance. HIRST to reaction to challenge in laboratory or glasshouse. Strain of virus should be stated where known and test e.g. sap inoculation or graft.

6.3.6	Virus C	1 = very susceptible		H = hypersensitive
		3 = susceptible		I = field immune
		5 = medium susceptible	and/or	R = resistant
		7 = resistant		S = susceptible
		9 = very resistant		T = tolerant
6.3.7	Virus M	1 = very susceptible		H = hypersensitive
		3 = susceptible		I = field immune
		5 = medium susceptible	and/or	R = resistant
		7 = resistant		S = susceptible
		9 = very resistant		T = tolerant
6.3.8	Virus S	1 = very susceptible		H = hypersensitive
		3 = susceptible		I = field immune
		5 = medium susceptible	and/or	R = resistant
		7 = resistant		S = susceptible
		9 = very resistant		T = tolerant
6.3.9	Virus X	1 = very susceptible		H = hypersensitive
		3 = susceptible		I = field immune
		5 = medium susceptible	and/or	R = resistant
		7 = resistant		S = susceptible
		9 = very resistant		T = tolerant
6.3.10	Virus Y	1 = very susceptible		H = hypersensitive
		3 = susceptible		I = field immune
		5 = medium susceptible	and/or	R = resistant
		7 = resistant		S = susceptible
		9 = very resistant		T = tolerant

6.4 RESISTANCE TO PESTS

6.4.1	Potato Cyst Nematode *Globodera spp.*	R or S, (= resistant or susceptible). State species, pathotype(s), and criteria used.
6.4.2	Aphids	1 = very low resistance 3 = low resistance 5 = moderate 7 = high resistance 9 = very high resistance
6.4.3	Slugs *Deroceras spp.* and *Milax spp.* State verbally species	1 = very low resistance 3 = low resistance 5 = moderate 7 = high resistance 9 = very high resistance
6.4.4	Tuber moth	1 = very low resistance 3 = low resistance 5 = moderate 7 = high resistance 9 = very high resistance

7. ENVIRONMENTAL STRESS FACTORS

7.1	Drought	1 = very low resistance 3 = low resistance 5 = moderate 7 = high resistance 9 = very high resistance
7.2	Frost	1 = very low resistance 3 = low resistance 5 = moderate 7 = high resistance 9 = very high resistance

APPENDIX

LIST OF THOSE CONSULTED

Commission Secretariat

J. Dehandtschutter
Commission of the European Communities, Rue de la Loi 200,
1049 Brussels, Belgium.

Mme. M. Wauters
Commission of the European Communities, DG VI F4, Rue de la Loi 86,
1049 Brussels, Belgium.

Chairman of Programme Committee for Resistance Breeding and Use of Genebanks

Ir. H.H. van der Borg
Ministry of Agriculture & Fisheries, Directorate of Agricultural
Research, Mansholtlaan 4, 6700 AB Wageningen, The Netherlands.

Programme Committee on Plant Productivity

Ir. H.H. van der Borg
Ministry of Agriculture & Fisheries, Directorate of Agricultural
Research, Mansholtlaan 4, 6700 AB Wageningen, The Netherlands.

J. Picard
Station d'Amélioration des Plantes, INRA, B.V. 1540, 21034
Dijon Cédex, France.

Members of the Expert Group

Dr. G. Fouarge
Station de Haute Belgique, Rue de Serpont 48, 6600 Libramont,
Chevigny, Belgium.

Dr. N.E. Foldo
Landbrugets Kartoffelfond LKF, Grindstedveg 55, DK-7184 Vandel,
Denmark.

Dr. P.J. Perennec
Station d'Amélioration de la Pomme de Terre, 29208 Landerneau,
France.

Dr. G.A. Andritos
Ministry of Agriculture, Plant Research Directorate, G. Kapnekoptiriou STR, Athens, Greece.

Dr. H.W. Kehoe
Plant Breeding Department, An Foras Taluntais, Oak Park Research Centre, Carlow, Ireland.

Dr. D. Cremaschi
Instituto Sperimentale per le Colture Industriali, Via di Corticella 133, 40129 Bologna, Italy.

Ir. M.J. Hijink
RIVRO, P.O. Box 32, 6700 AA Wageningen, Netherlands.

Dr.Ir. H. Lamberts
Foundation for Agricultural Plant Breeding, P.O. Box 117, 6700 AC Wageningen, The Netherlands.

Mr. D.E. Richardson
N.I.A.B., Huntingdon Road, Cambridge, CB3 OLE, United Kingdom.

Mr. D. MacDonald
D.A.F.S., Department of Scientific Services, East Craigs, Edinburgh, EH12 8NJ, Scotland.

Mr. G.R. Mackay
Scottish Crop Research Institute, Pentlandfield, Roslin, Midlothian, EH25 9RF, Scotland.

Mrs. Dr. G. Mix
Institut für Pflanzenbau und Pflanzenzüchtung FAL, Bundesalle 50, 3300 Braunschweig, Germany, F.R.

I.B.P.G.R.

Dr. J.H.W. Holden
International Board for Plant Genetic Resources, Via delle Terme di Caracalla, 00100 Rome, Italy.