



COST Action FA1306:
The quest for tolerant varieties –
Phenotyping at plant and cellular level



COST WG1 / EPPN2020 workshop 29th - 30th of September 2017

Novi Sad

Abstract book

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Scientific Programme

Friday, September 29th

8:00 – 9:00	Registration
9:00 – 9:05	Welcome
9:05 – 9:20	IFVCNS movie
9:20 – 9:45	Roland Pieruschka: <i>Integrating plant phenotyping community in Europe: EPPN2020: access to phenotyping facilities EMPHASIS: long term operation of pan European phenotyping infrastructure</i>
9:45 – 10:30	Key lecture: Hendrik Poorter: <i>Pampered inside, pestered outside? Ways to bridge the gap between lab and field experiments</i>
10:30 – 10:45	Coffee Break
Session 1: Phenotyping/Breeding for biomass improvement Chair: Roland Pieruschka	
10:45 – 11:00	Koller: <i>Non-invasive phenotyping technologies enable investigating plant responses to antibiotic and biotic interactions</i>
11:00 – 11:15	van Rooijen et al.: <i>High throughout phenotyping of photosynthesis and growth to identify relevant genetic loci in Arabidopsis</i>
11:15 – 11:30	Onno Muller: <i>BreedFACE: phenotyping for plants under elevated CO2 concentrations</i>
11:30 – 11:45	Sciara et al.: <i>High-throughput phenotyping of vegetative growth and water-use efficiency of durum wheat near isogenic lines for QYLD.IDW-3B, a major QTL for yield per se</i>
11:45 – 11:55	Ljubičić et al.: <i>Normalized Difference Vegetation Index (NDVI) as a tool for wheat yield traits estimation</i>
11:55 – 12:05	Hernandez et al.: <i>Quantization of Harvested Tomatoes from RGBD Images</i>
12:05 – 12:15	Herrera et al.: <i>How can drones and modern phenotyping methods contribute to the understanding of Genotype × Environment interactions (G × E)?</i>
12:15 – 12:25	Szabados et al.: <i>A non-destructive method to monitor plant growth and development in vitro</i>
12:25 – 12:35	Sekmen et al.: <i>The Role of Hydrogen Peroxide in Elongation Dynamics of the First Internode of a Wheat Cultivar Tolerant to Deep-Sowing Condition</i>
12:35 – 13:30	Lunch
13:30 – 14:30	Poster session
Session 2: Phenotyping/Breeding for nutrient efficiency Chair: Astrid Junker	
14:30 – 14:45	Junker et al.: <i>Integrated analysis of plant growth and development using high throughput multi-sensor platforms at IPK</i>

14:45 – 15:00	Salon et al.: <i>High throughput root phenotyping using the “Rhizo” suite</i>
15:00 – 15:15	Pastor et al.: <i>Relationship between liposoluble fingerprints and botanical origin of various agricultural crops</i>
15:15 – 15:30	Lillemo et al.: <i>Reliable and efficient high-throughput phenotyping to accelerate genetic gains in Norwegian plant breeding</i>
15:30 – 15:45	Vasconcelos et al.: <i>Phenotyping soybean and common bean for better growth and nutrition under elevated CO²</i>
15:45 – 16:15	Coffee Break
Session 3: Phenotyping/Breeding of perennial crops	
Chair: Rick Van de Zedde	
16:15– 16:30	Gonçalves & Martins: <i>An efficient phenotyping for selection in ancient grapevine varieties</i>
16:30– 16:45	Svensgaard et al.: <i>Phenotyping of perennial ryegrass by physiological fingerprinting and UAV remote sensing using RGB-, thermo- and multi-reflectance imaging</i>
16:45– 17:00	Corke et al.: <i>Breeding perennial species to enhance the sustainability of grassland based agriculture</i>
17:00– 17:15	He et al.: <i>Novel 3D Imaging System for Strawberry Phenotyping</i>
17:15– 17:30	Paudel et al.: <i>Heavy soil and treated waste water result in reduced hydraulics and reduced levels of plasma membrane aquaporin (PIP) mRNA in citrus trees</i>
17:30– 17:45	Costa et al.: <i>Dynamics of canopy and soil temperature variation in a Mediterranean vineyard</i>
20:00 – 23:00	Gala Dinner

Saturday, September 30th

8:30 – 9:00	Papa: <i>The impact of domestication on the phenotypic architecture of durum wheat under contrasting nitrogen fertilisation</i>
Session 4: Phenotyping/Breeding for biotic stress tolerance	
Chair: Diego Rubiales	
9:00 – 9:15	Boureau et al.: <i>Quantification of biotic stresses on aerial parts of plants using Chlorophyll Fluorescence Imaging and Image Analysis</i>
9:15 – 9:30	Rubiales: <i>Resistance to rusts: can we predict durability by complementation of field and growth chamber studies with histology?</i>
9:30 – 9:45	Costa et al.: <i>Phenotyping Castanea hybrids from controlled crosses for resistance to Phytophthora cinnamomi</i>
9:45 – 10:00	Aznar-Fernández & Rubiales: <i>Phenotyping Pisum sativum germplasm for resistance to aphid (Acyrtosiphon pisum) and weevil (Bruchus pisorum) under field and controlled conditions</i>
10:00 – 10:15	Svara et al.: <i>Polyploidy influences Malus x domestica / Venturia inaequalis interactions</i>

10:15 – 11:00	Coffee Break
Session 5: Phenotyping/Breeding for abiotic stress tolerance	
Chair: Sebastien Carpentier	
11:00 – 11:30	Pauk et al.: <i>Phenotyping for drought tolerance in wheat using complex stress diagnostic system</i>
11.30 – 11.45	Welcker_ et al.: <i>A genome-wide approach combining field and platform phenotyping to investigate plant responses to drought and high temperature</i>
11:45 – 12:00	Rakosy-Tican et al.: <i>Phenotyping preselected somatic hybrids of potato with the wild species <i>Solanum chacoense</i> and <i>S. bulbocastanum</i> for drought tolerance</i>
12:00 – 12:15	Carpentier et al.: <i>High throughput growtainer phenotyping combined with on line transpiration monitoring to select water efficient cultivars: a proof of principle in the banana bio(di)versity collection.</i>
12:15 – 12:30	Paul et al.: <i>Synergistic effects of salt and drought stress in wheat responses studied by high throughput phenotyping</i>
12:30 – 12:45	Sundgren et al.: <i>Root growth and anatomy of spring wheat in response to waterlogging</i>
12:45 – 13:00	Nazemi et al.: <i>Molecular mapping of root traits in durum wheat in environments with lower water availability</i>
13:00 – 13:15	Aliferis: <i>Functional genomics and phenomics: focusing on plant protection products' R&D</i>
13:15 – 13:30	Baytar et al.: <i>Association mapping for fiber traits and drought tolerance in elite cotton (<i>Gossypium hirsutum</i> L.) germplasm</i>
13:30 – 13:45	Ottosen et al.: <i>Phenotyping for heat tolerance - from lab to field</i>
13:45 – 14:00	Moshelion & Dalal: <i>Whole-plant stress performance analysis: a new tool for functional phenotyping</i>
14:00 – 14:30	Lunch
15:00 – 18:00	Excursion

Contents

Preface:	13
Integrating plant phenotyping community in Europe and beyond	13
Key lecture:	14
Pampered inside, pestered outside? Ways to bridge the gap between lab and field experiments	14
Session 1: Phenotyping/Breeding for biomass improvement.....	15
Oral presentations:	16
Non-invasive phenotyping technologies enable investigating plant responses to antibiotic and biotic interactions	16
High throughput phenotyping of photosynthesis and growth to identify relevant genetic loci in Arabidopsis	17
BreedFACE: phenotyping for plants under elevated CO ₂ concentrations.....	18
High-throughput phenotyping of vegetative growth and water-use efficiency of durum wheat near isogenic lines for QYLD.IDW-3B, a major QTL for yield per se	19
Normalized Difference Vegetation Index (NDVI) as a tool for wheat yield traits estimation	20
Quantization of Harvested Tomatoes from RGBD Images	21
How can drones and modern phenotyping methods contribute to the understanding of Genotype × Environment interactions (G × E)?	22
A non-destructive method to monitor plant growth and development <i>in vitro</i>	23
The Role of Hydrogen Peroxide in Elongation Dynamics of the First Internode of a Wheat Cultivar Tolerant to Deep-Sowing Condition	24
Poster presentations:	25
Integrating omic approaches for sustainable genetics resources' uses in Brassica breeding programmes	25
Effects of light-emitting diodes and fluorescent light on growth and development of Arabidopsis plants.....	26
Genotypic variation for NDVI and crop biomass at anthesis in six-rowed winter barley	27
Tropical pumpkin fruit phenotyping	28
Vintage phenotyping for modern breeding of false flax	29
The Finnish National Plant Phenotyping Infrastructure	30
Biomass dynamics and grain yield of triticale, barley and ryegrass in Mediterranean rainfed conditions	31
Effect of different treatments on the eggplant seed dormancy	32

Assessing genetic variability of Serbian and Austrian winter wheat varieties for pre-breeding	33
Variation in chlorophyll content in wheat near-isogenic lines for photoperiod response	34
Phenotypic characterization of the Serbian poppy (<i>Papaver somniferum</i> L.) population	35
Relationships among oil content, protein content and grain yield in wheat (<i>Triticum aestivum</i> , L.)	36
Phenotypic evaluation of variability among dry bean cultivars landraces from breeding collections of Institute of Field and Vegetable Crops Novi Sad	37
Relationship between NDVI and grain yield at different growing stages in winter wheat	38
Plant phenotyping installations available for EPPN2020 transnational access at the VIB-UGent Center for Plant Systems Biology, Belgium	39
Evaluation of hyperspectral data for assessing the physiological traits of diverse wheat genetic resources in field phenotyping.....	40
Can UAV's help to make variety testing and breeding more objective and more efficient?	41
Assessment of sugar beet hybrids based on morphological and root quality traits	42
Evaluation of fatty acids and tocopherols content in NS rapeseed collection	43
Sunflower attractiveness to pollinators	44
Fruit phenotypic evaluation of F ₂ sweet pepper progeny from Amfora x Piquillo.....	45
Interaction response of high yielding NS hybrids of sunflower	46
The use of NIT technology for determination of oil content in oilseed	47
Cytological analysis of <i>Camelina sativa</i> , <i>Brassica nigra</i> and <i>Sinapis alba</i> from a germplasm collection in Novi Sad	48
Duration of pre-heading period and its relationship with some grain properties in wheat genotypes.....	49
White mustard (<i>Sinapis alba</i> L.) agronomical characteristics variability.....	50
PCA analysis of yield components of onion (<i>Allium cepa</i> L.)	51
Raman microscopy/spectroscopy: non-destructive tool for the characterization of tomato fruit quality.....	52
PCA Classification of tomato genotypes based on physical and chemical fruit characteristics	53
Yield Stability and Selection Strategies for Chickpea in Portugal	54
Phenotyping and genomic selection on advanced breeding lines of bread wheat.....	55
Diversity of confectionery sunflower based on morphological characteristics	56

Dissecting genotype x environment interactions for yield and quality in oats: integration of ground, UAV and satellite data.....	57
Session 2: Phenotyping/Breeding for nutrient efficiency.....	58
Oral presentations:	59
The impact of domestication on the phenotypic architecture of durum wheat under contrasting nitrogen fertilisation	59
Integrated analysis of plant growth and development using high throughput multi-sensor platforms at IPK.....	60
High throughput root phenotyping using the “Rhizo” suite.....	61
Relationship between liposoluble fingerprints and botanical origin of various agricultural crops.....	62
Reliable and efficient high-throughput phenotyping to accelerate genetic gains in Norwegian plant breeding	63
Phenotyping soybean and common bean for better growth and nutrition under elevated CO ₂	64
Poster presentations:	65
Root-microbe phenotyping in plant breeding: Current Knowledge and Future Needs ...	65
Biochemical parameters related to butternut squash fruit nutritional and sensory quality: a preliminary screening	66
Phenotyping and accumulation of valuable nutrients in Agrobacterium-mediated genetic transformation system in common buckwheat.....	67
Chemometric discrimination of high- from low-lipid wheat cultivars using GC/MS data	68
Rutin content in seeds of European buckwheat (<i>Fagopyrum esculentum</i>) cultivars.....	69
Genotypic variation in zinc efficiency of Serbian maize hybrids evaluated in nutrient solution	70
Session 3: Phenotyping/Breeding for perennial crops	71
Oral presentations:	72
An efficient phenotyping for selection in ancient grapevine varieties.....	72
Phenotyping of perennial ryegrass by physiological fingerprinting and UAV remote sensing using RGB-, thermo- and multi-reflectance imaging	73
Breeding perennial species to enhance sustainability of grassland based agriculture ...	74
Novel 3D Imaging System for Strawberry Phenotyping	75
Heavy soil and treated waste water result in reduced hydraulics and reduced levels of plasma membrane aquaporin (PIP) mRNA in citrus trees	76
Dynamics of canopy and soil temperature variation in a Mediterranean vineyard.....	77
Poster presentations:	78

Leaf photosynthetic characteristics in a willow (<i>Salix</i> spp.) and poplar (<i>Populus</i> spp.) pot trial in response to wastewater sludge treatments	78
Breeding vine cacti with improved tolerance to heat stress	79
Phenotyping and genotyping of a mutant collection of giant reed (<i>Arundo donax</i> L.)	80
Session 4: Phenotyping/Breeding for biotic stress tolerance	81
Oral presentations:	82
Quantification of biotic stresses on aerial parts of plants using Chlorophyll Fluorescence Imaging and Image Analysis.....	82
Resistance to rusts: can we predict durability by complementation of field and growth chamber studies with histology?	83
Phenotyping <i>Castanea</i> hybrids from controlled crosses for resistance to <i>Phytophthora cinnamomi</i>	84
Phenotyping <i>Pisum sativum</i> germplasm for resistance to aphid (<i>Acyrtosiphon pisum</i>) and weevil (<i>Bruchus pisorum</i>) under field and controlled conditions.....	85
Presymptomatic leaf disease detection with a five-band multispectral imager	86
Polyploidy influences <i>Malus x domestica</i> / <i>Venturia inaequalis</i> interactions	87
Poster presentations:	88
Managing on-farm biosecurity risk through pre-emptive breeding: rust of peas and lentils.....	88
Preliminary results of use of thermal imaging in sunflower phenomics	89
Phenotypic changes in camelina plants caused by pathogenic fungus <i>Albugo candida</i> ..	90
Stripe rust severity assessments and its relations to winter wheat yield losses.....	91
Sunflower breeding for biotic stress resistance	92
Rapid high-throughput phenotyping of an EMS mutant platform of <i>Cucurbita pepo</i> for tolerance to abiotic and biotic stresses	93
Biochar induced bacterial and fungal microbiome promotes plant growth and mediates systemic resistance in tomato against soilborne disease.....	94
Phenotyping under realistic abiotic and biotic stress conditions the HMGU –SCREENs.	95
Session 5: Phenotyping/Breeding for abiotic stress tolerance	96
Oral presentations:	97
Phenotyping for drought tolerance in wheat using complex stress diagnostic system ...	97
A genome-wide approach combining field and platform phenotyping to investigate plant responses to drought and high temperature	98
Phenotyping preselected somatic hybrids of potato with the wild species <i>Solanum chacoense</i> and <i>S. bulbocastanum</i> for drought tolerance	99

High throughput growtainer phenotyping combined with on-line transpiration monitoring to select water efficient cultivars: a proof of principle in the banana bio(di)versity collection.....	100
Synergistic effects of salt and drought stress in wheat responses studied by high throughput phenotyping.....	101
Root growth and anatomy of spring wheat in response to waterlogging.....	102
Molecular mapping of root traits in durum wheat in environments with lower water availability	103
Functional genomics and phenomics: focusing on plant protection products' R&D	104
Association mapping for fiber traits and drought tolerance in elite cotton (<i>Gossypium hirsutum</i> L.) germplasm	105
Phenotyping for heat tolerance - from lab to field.....	106
Whole-plant stress performance analysis: a new tool for functional phenotyping.....	107
Poster presentations:	108
Comparative phenotypic analysis of wild and cultivated sunflower for improved crop resilience	108
Biochemical and molecular basis of the drought tolerance in field pea	109
<i>In vitro</i> mutagenesis as a tool for speeding up conventional plant breeding: a case study with bread wheat.....	110
Marker associated analysis of drought tolerance in F ₂ segregated population derived from reciprocal cross of Sagittario x M ₆ Sagittario derived drought tolerant mutant(s).....	111
Drought priming effects on alleviating later damages of heat and drought stress in different wheat cultivars.....	112
Determination of radical scavenging activity and antioxidant power of <i>Brassica napus</i> under salt stress.....	113
A multiple criteria decision-making approach to waterlogging response evaluation in a worldwide collection of <i>Lathyrus sativus</i>	114
Oxidative stress in black and yellow soybean grown in organic production system	115
Non-invasive analysis of biomass accumulation and geometry of sorghum plants growing under drought.....	116
Research adaptation of plant <i>Nicotiana tabacum</i> generation T-1 expressing gene <i>desA</i> cyanobacteria to cold stress conditions	117
Assessing genotypic variability in the morpho-functional response of garlic to water availability	118
Changes in root architecture involving drought tolerance in oats.....	119
Ideotype South - Searching for adapted wheat varieties in Mediterranean region of South of Europe	120
Winter wheat agronomic traits as affected by soil cadmium contamination	121

Early changes in physiological parameters after <i>Trichoderma</i> -Tomato interaction in water stress conditions	122
Two mitogen-activated protein kinases MPK12 and MPK4 are essential components of CO ₂ -induced stomatal regulation	123
Time-course analysis of stomatal conductance, chlorophyll content and fluorescence in barley under drought stress.....	124
Using supervised machine learning to explore <i>Vicia faba</i> adaptations to agro-climatic	125
Osmotic stress responses of <i>Bradyrhizobium japonicum</i> strains	126
ABA synthesis in guard cells or phloem controls stomata, but OST1 is the key for VPD response.....	127
Guaiacol peroxidase activity in sunflower hybrids seedlings	128
Monitoring of plants by high-throughput phenotyping facility in hydric stress context	129
High-throughput phenotyping of an elite durum wheat association panel reveals differential selection for a root architecture QTL in response to different water regimes	130
High-throughput phenotyping platforms for screening of root traits on edaphic stress adaptation.....	131
Application of fast non-invasive methods for phenotyping the responses of lettuce plants to drought and mycorrhizal inoculation	132

Assessment of sugar beet hybrids based on morphological and root quality traits

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Sugar beet is the most important plant for sugar production in Europe and other temperate climate regions of the world. Broad genetic diversity is crucial for successful breeding program. The main objective of this study was to evaluate 10 sugar beet hybrids based on their morphological and root quality traits and to determine which genotypes are preferable source for new gene collection and selection program. The trial was performed during the growing season of 2016 on the fields of the Institute of field and vegetable crops, at location Rimski Šančevi. Among the explored genotypes, two were from domestic breeding centers while eight belonged to foreign seed institutions. Standardized mean values of all characteristics were used for analysis. The evaluation included Principal Component Analysis (PCA) for the following traits: root weight (g), root length (cm), root diameter (cm), root volume (cm³), root/head ratio (%) specific root weight (g/cm³) and sugar content (%). According to results significant level of diversity was found for all examined traits. Four principal components with their values of 50,2%; 24,4%; 11,9% and 10,4% determined total variance by the amount of 97,96%. Investigated genotypes could be divided into four distinct groups.

Keywords: sugar beet, root, PCA, multivariate analysis