



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

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PCA Classification of tomato genotypes based on physical and chemical fruit characteristics

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Importance of tomato, being considered as "functional food" is reflected by the rising trend of harvested areas and consumption *per capita*, in recent decades. Beside specific demands, fruit quality is common for both, consumers of fresh fruits and processing industry. The objective of this study was to characterize 20 tomato genotypes based on physical and chemical quality characteristics and to segregate perspective genotypes for improvement of tomato quality by breeding programs. The experiment was carried out during three consecutive years (2010-2012) at experimental fields at Rimski Šančevi site, near Novi Sad. Five landraces, four old varieties, eight breeding lines and three commercial cultivars were chosen for the investigation. Following fruit characteristics were analyzed: average weight (g), length (cm), width (cm), pericarp thickness (mm), locule number, moisture content (%), total soluble solids (*°Brix*), ash content (%), total acidity (%) and *pH* value. Diversity of genotypes in all analyzed traits was found. Four principal components explained 90,6% of total variance or 36,5%, 24,2%, 19,8% and 10,1, respectively. Along the axis of the first main component, genotypes were classified into three groups. Genotypes with the thickest pericarp, highest total soluble solids, ash content, and acidity were identified, as promising for quality improvement in tomato breeding programs.

Keywords: fruit, PCA, tomato, quality