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List of Abstracts since 2009

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Title:	Impact of nitrogen fertilisation and irrigation on water utilization efficiency, N accumulation, growth and yields of <i>Zea mays</i> L.
Authors:	Abou El Hassan W.H., Hafez EM, Ghareib A.A.A., Freeg M.R., Seleiman M.F.
Journal:	Journal of Food, Agriculture & Environment
Year of publishing:	2014
Volume & Issue & Pages:	Volume 12; Issue 4; Pages 217-222
Abstract:	Water and N are considered the most limiting factors for the growth and yield during the grain filling stage, particularly in the arid, semi-arid zones. The aim of the study was to investigate the effect N applications (0, 140, 280 and 420 kg ha ⁻¹) and water regimes (I ₁ = 100%, I ₂ = 80% and I ₃ = 60% of field capacity) on nitrogen use efficiency (NUE), water utilization efficiency (WU _t E) and related parameters and grain yield and its components of <i>Zea mays</i> L. (cv maize hybrid SC-10). The highest N application resulted in a significant increase in grain yield and its components, accumulated N in grains and shoots. However, it significantly decreased apparent N fertilizer recovery (ANR), N utilization efficiency when all water regimes were applied. N application of 280 kg ha ⁻¹ was the optimal in our study for such environmental conditions. Yield and its components were increased with increasing soil field capacity from 60 to 100%. There was a significant effect of the interaction between irrigation and N treatments on N efficiencies, growth, and consequently on yields. In conclusion, the results showed that the yield of maize can be increased through the reasonable N application (i.e. declining the gap between the recommended N levels and the estimated levels) and suitable irrigation regime (I ₂). Also, the optimal management of N practices is highly recommended to avoid the loss of the N when there is a deficiency or excessive in water supplied to the soil.

Title:	Biomass yield and quality of bioenergy crops grown with synthetic and organic fertilizers
Authors:	Mahmoud F. Seleiman, Arja Santanen, Seija Jaakkola, Päivi Ekholm, Helinä Hartikainen, Frederick L. Stoddard, Pirjo S. A. Mäkelä
Journal:	Biomass & Bioenergy Journal
Year of publishing:	2013
Volume & Issue & Pages:	Volume 59, Pages 477-485.
Abstract:	Utilization of sludge is an attractive option for fertilizing bioenergy crops, since in addition to its valuable macro- and micro-nutrients, it may also contains some pollutants. Therefore, a three-year field experiment was conducted to investigate the suitability of sewage and digested sludge in comparison to synthetic fertilizer on biomass production and its quality in three crop species, with specific attention to the relationship between N availability and biomass accumulation. Fertilizer treatments for each crop species were standardized on the basis of total Nitrogen as follows: maize 120 kg ha ⁻¹ , fibre hemp 60 kg ha ⁻¹ and oilseed rape 90 kg ha ⁻¹ Nitrogen. The highest biomass yield of maize (30 Mg ha ⁻¹ Dry Mass) and hemp (15 Mg ha ⁻¹ Dry Mass) was obtained from the sewage sludge treatment. The sludge treatment also gave the highest leaf Nitrogen mass in biomass of both maize (14 g kg ⁻¹) and hemp (18 g kg ⁻¹) at 60 DAS (flowering stage). Sewage sludge increased slightly gross energy yield of maize (438 GJ ha ⁻¹) and hemp (272 GJ ha ⁻¹) in comparison to other treatments. The mass fraction of ash and the combustion-relevant elements such as Chlorine, Potassium, Sodium and Calcium were lower in crops fertilized with sewage sludge than in those fertilized with synthetic fertilizer. In conclusion, sewage sludge produced as high biomass yield as synthetic fertilizers. In addition, it improved growth and quality of biomass.

Title:	Improved sustainability of feedstock production with sludge and interacting mycorrhiza
Authors:	Mahmoud F. Seleiman, Arja Santanen, Jouko Kleemola, Frederick L. Stoddard, Pirjo S. A. Mäkelä
Journal:	Chemosphere Journal
Year of publishing:	2013
Volume & Issue & Pages:	Volume 91, Pages 1236-1242.
Abstract:	
<p>Recycling nutrients saves energy and improves agricultural sustainability. Sewage sludge contains 2.6% P and 3.1% N, so the availability of these nutrients was investigated using four crops grown in either soil or sand. Further attention was paid to the role of mycorrhiza in improvement of nutrient availability. The content of heavy metals and metalloids in the feedstock was analysed. Sewage sludge application resulted in greater biomass accumulation in ryegrass than comparable single applications of either synthetic fertilizer or digested sludge. Sewage sludge application resulted in more numerous mycorrhizal spores in soil and increased root colonization in comparison to synthetic fertilizer. All plants studied had mycorrhizal colonized roots, with the highest colonization rate in maize, followed by hemp. Sewage sludge application resulted in the highest P uptake in all soil-grown plants. In conclusion, sewage sludge application increased feedstock yield, provided beneficial use for organic wastes, and contributed to the sustainability of bioenergy feedstock production systems. It also improves the soil conditions and plant nutrition through colonization by mycorrhizal fungi as well as reducing leaching and need of synthetic fertilizers.</p>	

Title:	Feedstock quality and growth of bioenergy crops fertilized with sewage sludge
Authors:	Mahmoud F. Seleiman, Arja Santanen, Fredrick L. Stoddard, Pirjo Mäkelä
Journal:	Chemosphere Journal
Year of publishing:	2012
Volume & Issue & Pages:	Volume 89; Pages 1211-1217.
Abstract:	<p>Sewage sludge is rich in essential plant nutrients, but its use is restricted for crop production due to the pollutants it contains, such as metalloids and heavy metals. Sludge is also very sticky and compact. Therefore, the objectives of this work were to evaluate (1) the impact of various amounts of sludge on bioenergy crop productivity and quality, and (2) the use of peat as an adjuvant to reduce the stickiness, density and nutrient richness of the sludge. Three different applications of sludge were examined, high, low (50% of high) and low mixed with an equal volume of peat. The sludge-peat mix increased significantly leaf area and biomass accumulation of maize and hemp. High sludge and sludge-peat mix applications increased significantly the leaf area and biomass accumulation as well as the net photosynthesis of oilseed rape. High sludge application resulted in the highest heavy metal and metalloid accumulation in maize and hemp. Sludge-peat mix resulted in the highest heavy metal and metalloid accumulation in oilseed rape. However, the sludge-peat mix application provided the best feedstock quality in all three crops, since chloride, silicon and sulphur concentrations and ash content in plant material were the lowest of the three sludge treatments.</p>

Title:	Productivity, grain and dough quality of bread wheat grown with different water regimes
Authors:	Mahmoud Seleiman, Sayed Abdel-Aal, Mahmoud Ibrahim, Gamal Zahran
Journal:	Journal of Agro Crop Sciences
Year of publishing:	2011
Volume & Issue & Pages:	Volume 2, Pages 11-17.
Abstract:	
<p>Irrigation is an important factor influencing yield and grain quality of bread wheat (<i>Triticum aestivum</i> L.). In the present study, we investigated the effect of different water regimes on yield components and grain quality characteristics of the bread wheat cultivar Gemmeiza 9 grown in the Nile Delta during two growing seasons. Four water regimes were compared that corresponded to three irrigations (I₃) and four irrigations (I₄) at 30 days intervals, and five irrigations (I₅) and six irrigations (I₆) at 25 days intervals. Increasing number of irrigations up to five increased yield and its components but significantly decreased bran, protein and gluten percentages and drastically changed dough characteristics assessed by both farinograph and extensograph. Water absorption and dough stability time measured by the farinograph and dough resistance to extension assessed by the extensograph significantly decreased while dough weakness and extensibility, respectively assessed by the farinograph and extensograph, increased with the number and frequency of irrigation. Flour percentage as well as bran, ash and carbohydrates concentration were significantly associated to thousand kernel weight, while gluten concentration, water absorption, dough stability time and weakness appeared to be driven by protein concentration of the grain. Different compromises between grain yield and technological and rheological qualities can be obtained by managing irrigation number and frequency.</p>	

Title:	Effect of sowing dates on productivity, technological and rheological characteristics of bread wheat
Authors:	Mahmoud Seleiman, Mahmoud Ibrahim, Sayed Abdel-Aal, Gamal Zahran
Journal:	Journal of Agro Crop Sciences
Year of publishing:	2011
Volume & Issue & Pages:	Volume 2, Pages 1-6.
Abstract:	
<p>The aim of this investigation was to determine the effect of different sowing dates (i.e., 1st November, 15th November, 1st December and 15th December) on growth, grain filling traits and yield and its components as well as grain quality and rheological properties of bread wheat (<i>Triticum aestivum</i> L.) cultivar Gemmeiza 9 during two growing seasons in Nile Delta region, Egypt. The experiment was carried out in a randomized complete block design with four replications. The results revealed that sowing date on 15th November surpassed the other sowing dates in all of the studied parameters, grain filling rate, flour percentage. However, sowing date on 15th December caused an increase in most of technological properties (protein and wet and dry gluten percentages), milling characteristics (fine and coarse bran percentages) and rheological properties (water absorption percentage, dough stability time and resistance to extension).</p>	

Title:	Effect of seeding rates on productivity, technological and rheological characteristics of bread wheat (<i>Triticum aestivum</i> L.)
Authors:	Mahmoud Seleiman, Mahmoud Ibrahim, Sayed Abdel-Aal, Gamal Zahran
Journal:	International Journal for Current Research
Year of publishing:	2010
Volume & Issue & Pages:	Volume 4, Pages 75-81.
Abstract:	<p>Seeding rate is an important factor can influence on yield and quality of bread wheat (<i>Triticum aestivum</i> L.). In the present study, we investigated the effect of different seeding rates on growth, yield components, grain and dough quality characteristics of the bread wheat cultivar Gemmeiza 9 grown in the Nile Delta, Egypt during two growing seasons. Four seeding rates were studied: 250 grains / m², 300 grains / m², 350 grains / m² and 400 grains / m² with four replications. Increasing seeding rates up to 350 or 400 grains / m² increased grain, straw and biological yields and number of tillers and spikes per m² but significantly decreased grain filling rate. Moreover, the highest seeding rate (400 grains / m²) gave the highest and best percentages of bran, protein and gluten as well as the highest dough in strength which assessed by both Farinograph and Extensograph. Water absorption percentage and dough stability time (measured by the Farinograph) and dough resistance to extension and proportional number (analyzed by the Extensograph) significantly increased while dough weakness and extensibility, respectively assessed by the Farinograph and Extensograph, decreased by increasing seeding rates from 250 to 400 grains / m².</p>

Title:	Variation of yield and milling, technological and rheological characteristics in some Egyptian bread wheat (<i>Triticum aestivum</i> L.) cultivars.
Authors:	Mahmoud Seleiman, Sayed Abdel-Aal, Mahmoud Ibrahim, Philippe Monneveux
Journal:	Emirates Journal of Food and Agriculture
Year of publishing:	2010
Volume & Issue & Pages:	Volume 22; Issue 2; Pages 84-90.
Abstract:	<p>A field experiment was conducted to evaluate yield, milling, technological and rheological characteristics of four Egyptian bread wheat cultivars (Gemmeiza 7, Gemmeiza 9, Sakha 93 and Giza 168). Results showed that Gemmeiza 9 had the highest number of spikes per m², number of grains per spike and grain yield. Gemmeiza 7 had the highest fine and coarse bran, protein, wet and dry gluten percentages as well as the best farinograph and extensograph properties (dough development time, dough stability time and dough resistance to extension). Sakha 93 had higher flour and carbohydrate percentages than the other cultivars. Consequences for breeding are discussed.</p>

Title:	Effect of nitrogen fertilization on yield, technological and rheological characters of wheat (<i>Triticum aestivum</i> L.)
Authors:	Sayed Abdel-Aal, Mahmoud Ibrahim, Mahmoud Seleiman
Journal:	Egyptian journal of Agronomy
Year of publishing:	2009
Volume & Issue & Pages:	Volume 31; Issue 1; Pages 95-107.
Abstract:	<p>This investigation was carried out at the Experimental Farm, Faculty of Agriculture, Minufiya University. Shebin El-Kom, Egypt during 2004/2005 and 2005/2006 seasons to study the effect of nitrogen (N) fertilization (0, 25, 50, 75 and 100 kg N/fed) on yield and its components, milling, technological and rheological characters of wheat crop (<i>Triticum aestivum</i> L.). The data revealed that plant height, number of tillers, spikes/m², spike length, number of spikelets, number of grains and yield/spike, 1000-grain weight and grain, straw and biological yields/fed as well as harvest index were significantly affected by N fertilization. Increasing nitrogen fertilization from zero up to 100 kg N/fed significantly increased also flour and fine bran, but decreased coarse bran. Protein wet and dry gluten fractions were significantly increased with increasing nitrogen applications up to 75 kg N/fed. The highest values of total carbohydrate content and the lowest value of ash content were recorded when using 100 kg N/fed. On the other hand, the highest values for farinograph characters (water absorption percentage, dough stability time) were obtained by using 100 kg N/fed, but the highest value of dough weakness was recorded by unfertilized plants.</p>

Title:	Effect of different water regimes on agronomical traits and irrigation efficiency in bread wheat (<i>Triticum aestivum</i> L.) grown in the Nile Delta.
Authors:	Mahmoud E. Ibrahim, Sayed M. Abdel-Aal, Mahmoud F. M. Seleiman, Hamid Khazaei, Philippe Monneveux
Journal:	Wheat Information Service
Year of publishing:	2009
Volume & Issue & Pages:	Volume 109; Pages 5-9.
Abstract:	
<p>Irrigation is the most important factor in determining bread wheat (<i>Triticum aestivum</i> L.) yield in Egypt. The effects of different water regimes were investigated during two years on growth and yield components of the cultivar Gemmeiza 9 cultivated under three and four irrigations at 30 days interval, and five and six irrigations at 25 days interval. Grain filling rate and effective grain filling period were also calculated for each treatment. Significant effects of the water regime were found on all measured traits. However, increasing the number of irrigations from five to six, keeping the same interval of time between irrigations, did not significantly increased grain yield, harvest index, number of tillers and spikes per m², spike length and fertility, thousand kernel weight and grain weight per spike. The grain production obtained by irrigation (or irrigation efficiency) was similar under three and four irrigations at 30 days interval but drastically decreased under five and six irrigations at 25 days interval. For the number of tillers and spikes per m² as well as for grain yield, gains decreased with each additional irrigation, up to three irrigations. Conversely, for the number of grain per spike and to a lesser extent for thousand kernel weight, the highest gains were noted when both the number and frequency of irrigation increased, i.e. when the crop was irrigated five times at 25 days interval, rather than four times at 30 days intervals. The study emphasizes the importance, for irrigated wheat, to define irrigation timing and frequency that allow maximal yield and optimal use of irrigation water.</p>	