



Tropentag 2019: Parallel oral thematic session II

Cereals and pulses sustainable agri-food systems under climate change

Kassel 18-20 September 2019

Andrea Visioni

icarda.org

International Center for Agricultural Research in the Dry Areas

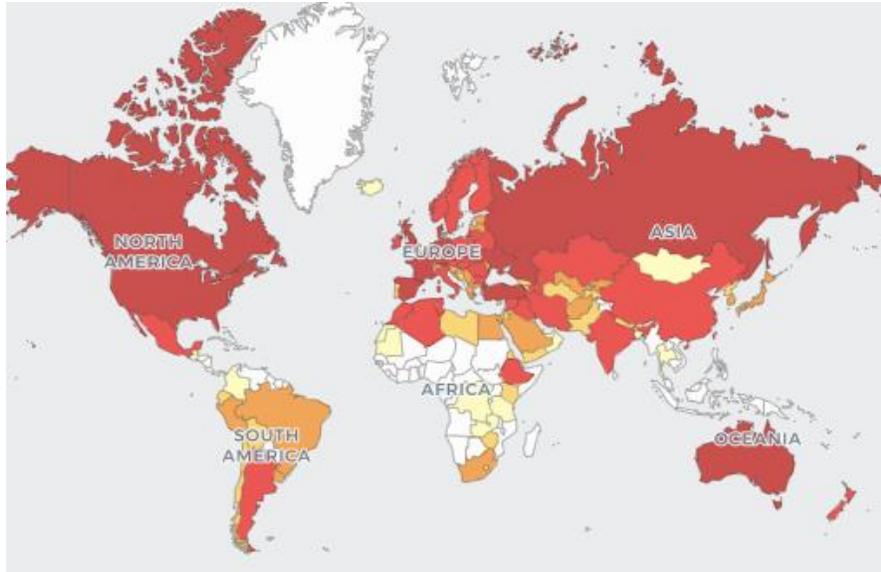
cgiar.org
A CGIAR Research Center



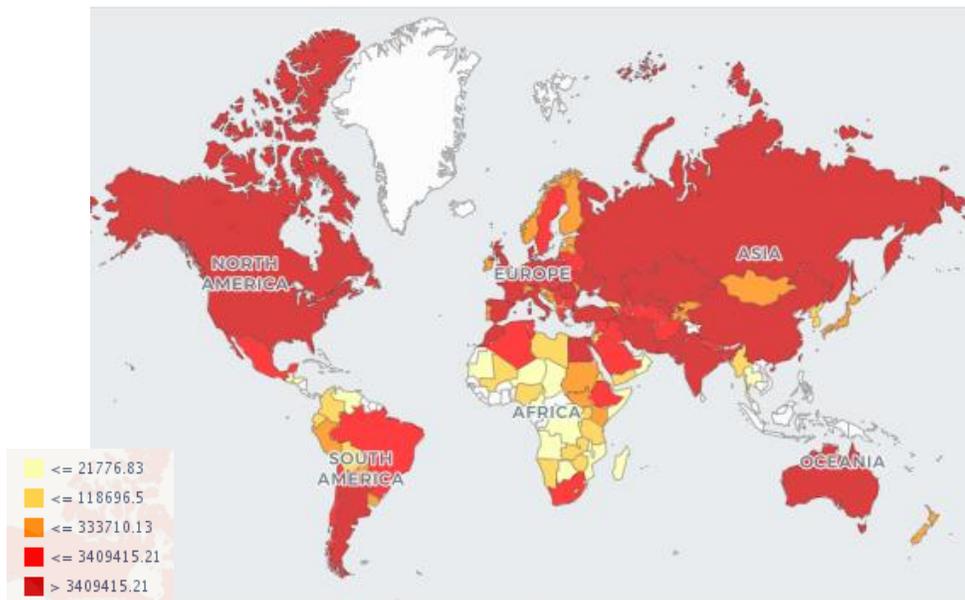
Barley is GOING to replace wheat in dry areas



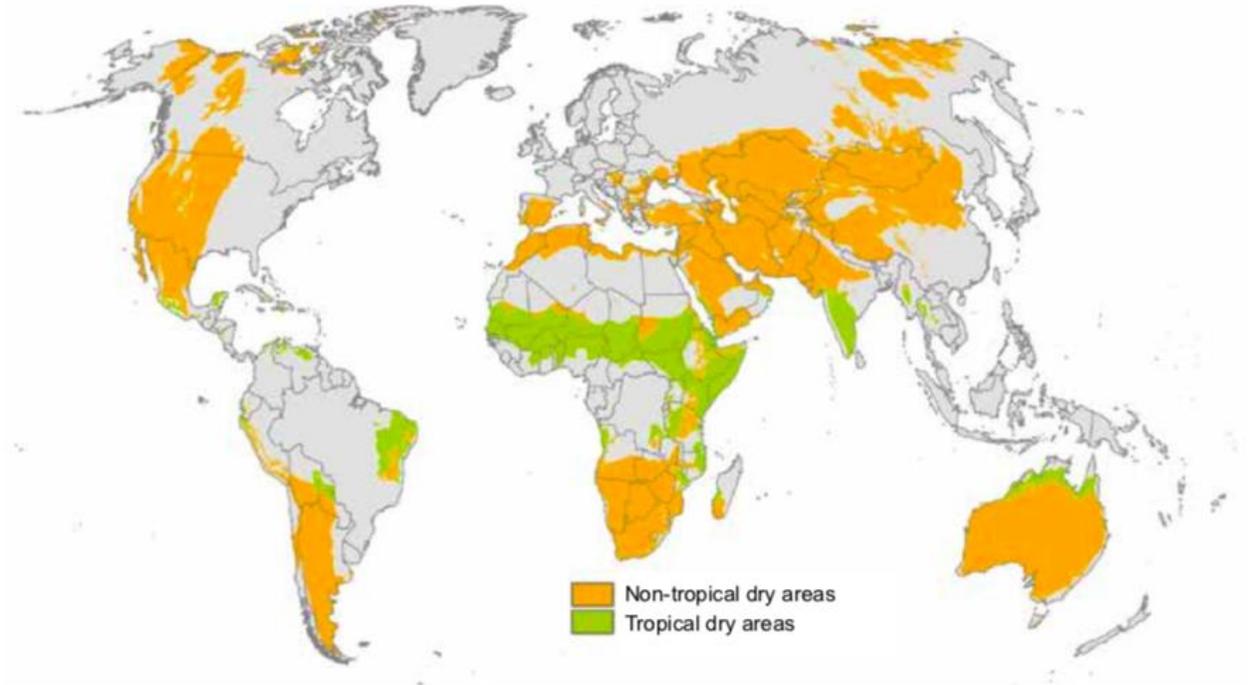
Barley production areas



Wheat production areas



Source: FAOSTAT



- Barley is a major staple food in several regions of the world: in parts of North Africa and Near East and in the highlands of Central Asia and South America.
- In the non tropical dry-areas, its grain and straws are the principal feed for livestock. Small ruminants such as sheep and goats are the main livestock in those countries and represent a valuable dietary contribution in rural areas as well as the principal economic output

- Barley had a reputation for building strength, and was used by the Gladiators (named in Latin *Hordearii* literally, "barley men") in their training diet.
- Since its domestication, it has been the energy food of the masses especially in regions characterized with harsh living conditions and low productive systems (mostly in developing countries).
- Compared to other temperate cereal crops, barley exhibits a great adaptability to different environments as well as a higher tolerance to drought, salinity and high temperatures allowing its extensive cultivation in temperate and semi-arid climatic zones of the Mediterranean basin.



- Nevertheless, as wheat was gaining importance for making bread in the Middle Ages, barley virtually disappeared from solid diets of many countries, being used primarily for feed and, to a lesser extent, in manufacturing beer and whiskey (Newman and Newman, 2008).
- The reason is due to its gluten content. This protein is the substance that causes bread to swell, better texture, and increase water retention.



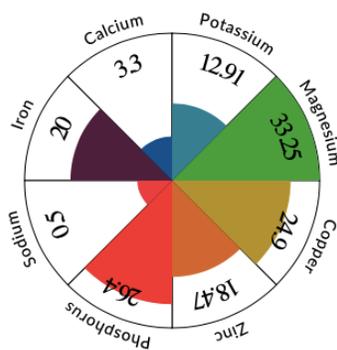
Barley Nutrition facts

In a 100-g serving, raw barley provides 352 kilocalories and is a rich source (20% or more of the Daily Value, DV) of essential nutrients, including protein, dietary fiber, the B vitamin, niacin (31% DV) and vitamin B6 (20% DV), and several dietary minerals. Highest nutrient contents are for manganese (63% DV) and phosphorus (32% DV). Raw barley is 78% carbohydrates, 1% fat, 10% protein, and 10% water.

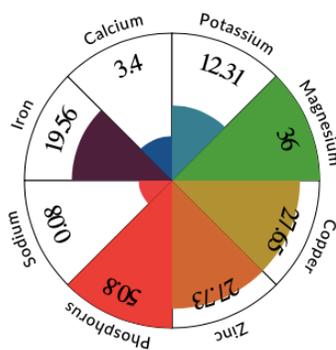
Wheat Nutrition Facts

In 100 grams, wheat provides 327 kilocalories and is a rich source (20% or more of the Daily Value, DV) of multiple essential nutrients, such as protein, dietary fiber, manganese, phosphorus and niacin. Several B vitamins and other dietary minerals are in significant content. Wheat is 13% water, 71% carbohydrates, and 1.5% fat. Its 13% protein content is mostly gluten (75-80% of the protein in wheat).

Mineral content

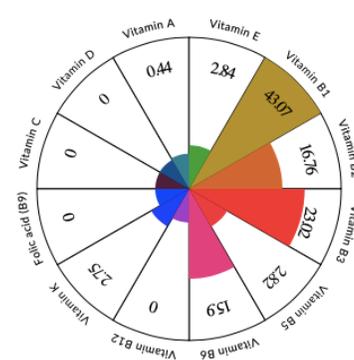


Barley

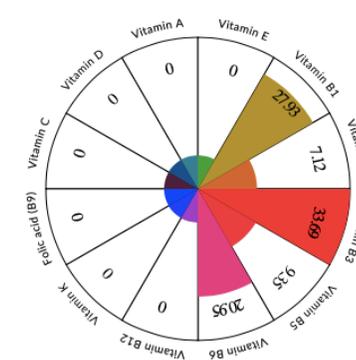


wheat

Vitamin content

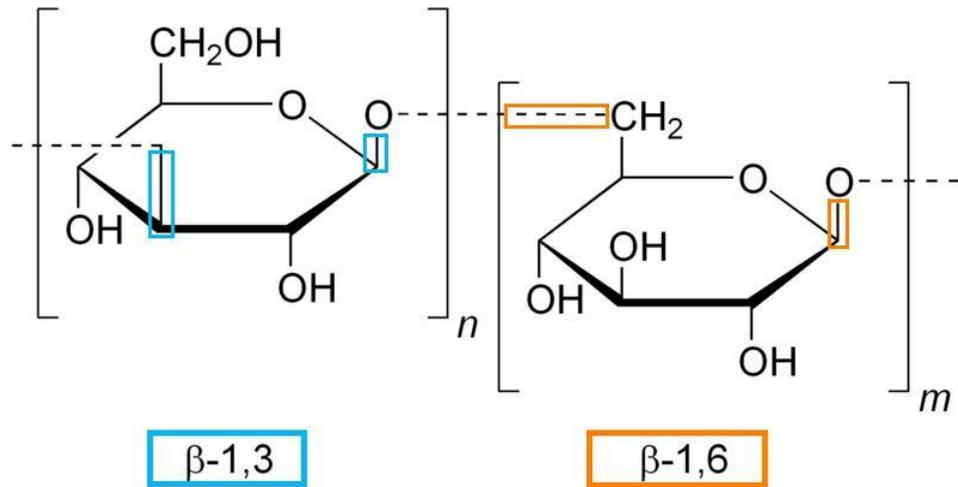


Barley



wheat

B-glucans an added value to barley by products



What makes Beta-glucan to your body?

- Inhibit the free radical in body
- Stimulate the macrophage of the immune system
- Modulate an allergic immune of the physical condition (Hypoallergenic)
- Prevent of Infection and viral diseases
- Balance cholesterol and fasting blood sugar level
- Relieve inflamed rheumatism
- Lessen the suffer from constipation
- Enhance and maintain moisture within skin
- Wound healing and abirritate inflammation

- Whole grain barley is minimally processed; it is low in fat and calories, high in fiber, contains antioxidants and offers a variety of health benefits.
- Barley bread is also provides vitamins and minerals, fiber, selenium and many other nutrients that are not found in breads made with refined bread flour
- Nutritionists say the dietary benefits of barley are significant and more beneficial than other grains.



Durum/barley pasta



Beside being an popular and ancient food in most of our mandate countries, barley is starting to become quite popular in Europe and USA and in other countries (bread in Turkey, flat bread in Egypt etc.)

Different barley flour give different texture and can increase or decrease pasta quality and cookability

New pasta made from a mixture of raw materials grown in Italy, good-quality durum wheat semolina and flour made from a barley cultivar with a high beta-glucan content.



Barley:

Abiotic stress:

- Drought
- Heat
- Cold/frost
- Salinity

Biotic stress:

- Stripe rust
- Leaf rust
- Stem rust
- Powdery mildew
- Net and spot blotch
- Scald
- Blights (Asia)

Quality traits:

- B-glucans
- Malting
- Increased Fe and Zn content

60% animal feed, 30 malting and 10% human feed.



Thank You!