



UNIVERSIDAD
CIENTÍFICA
DEL SUR

Cambio climático y reto agrario para la seguridad alimentaria

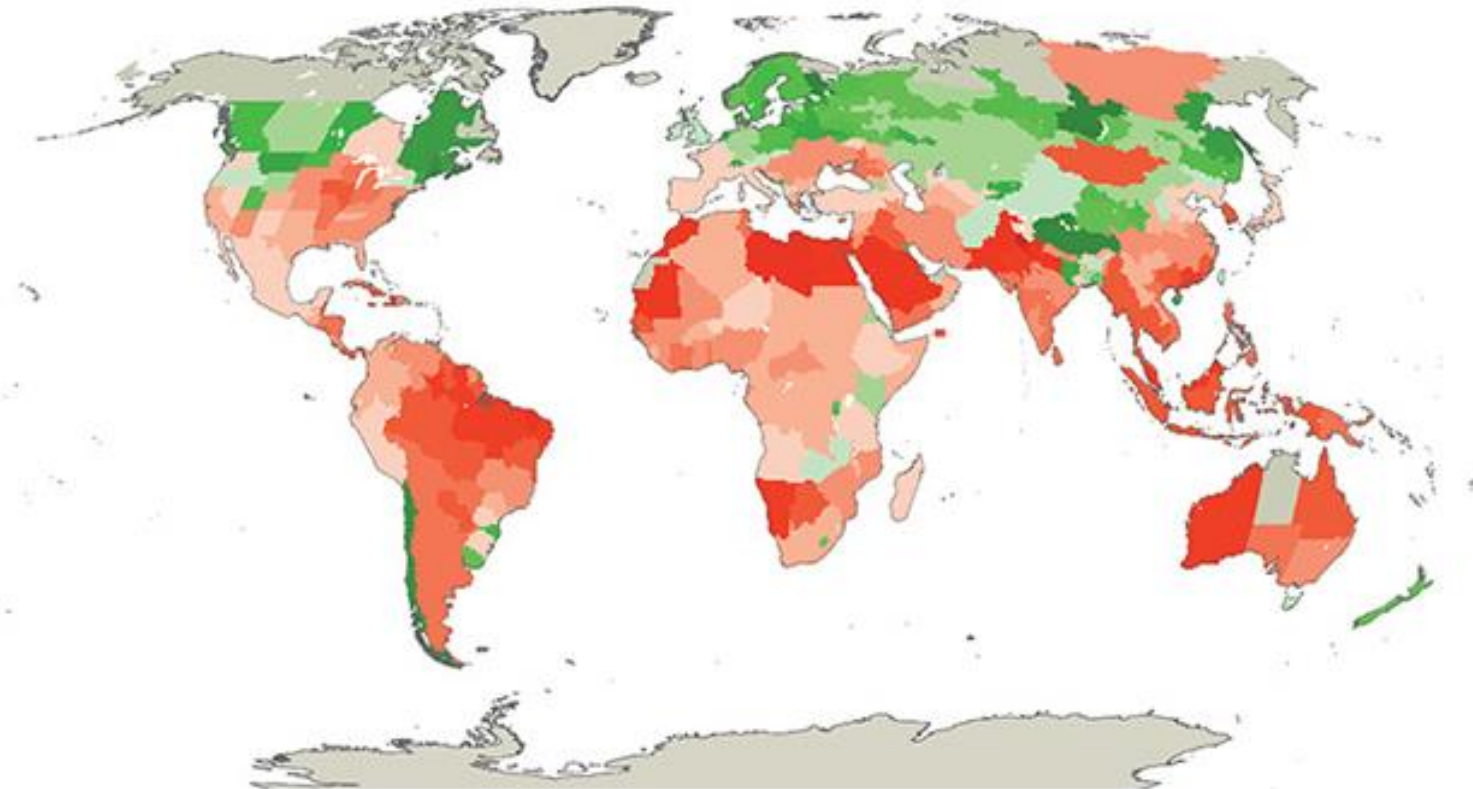
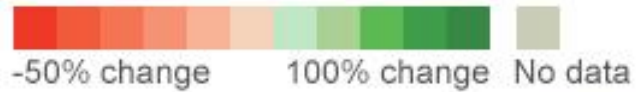
Climate change and agricultural challenge for Food security

Susan Medina, PhD
Coordinación de Investigación

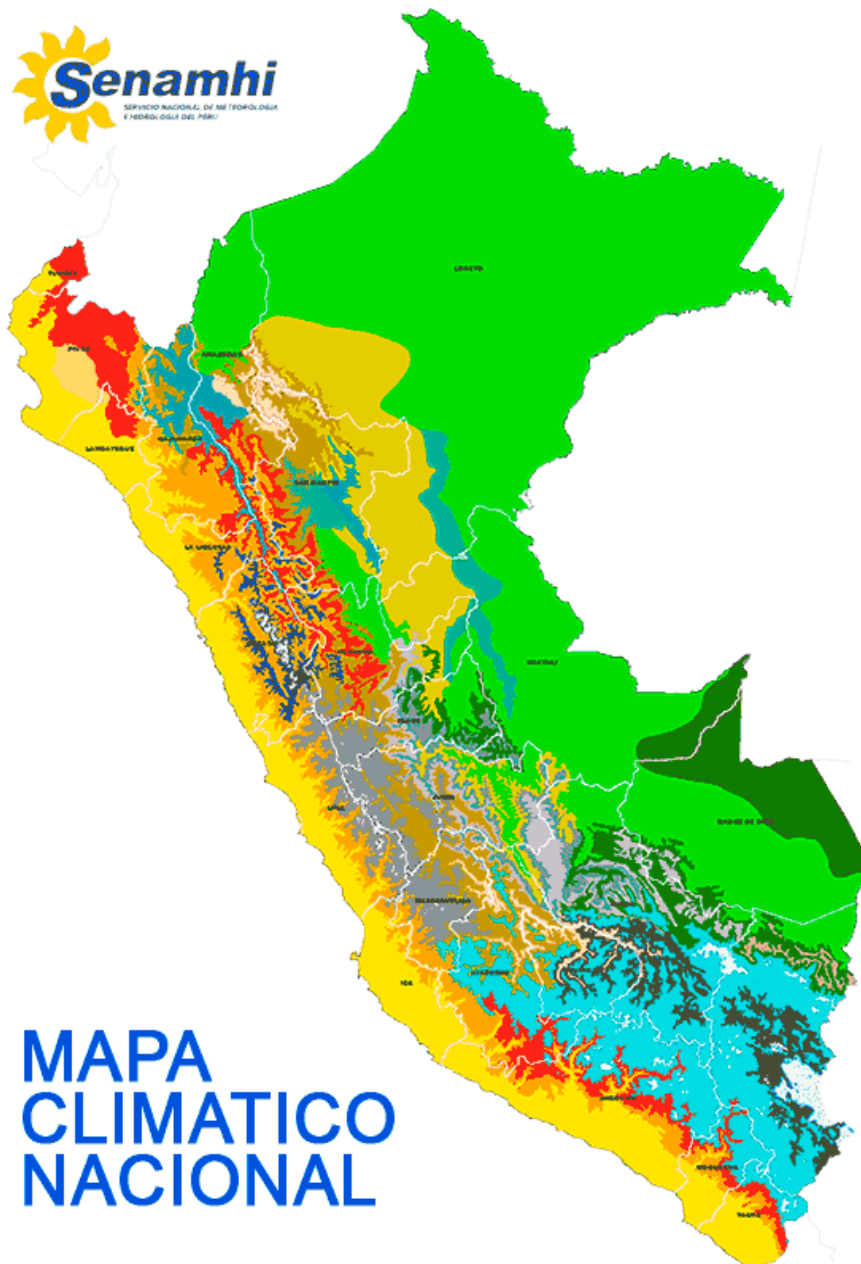
II Foro internacional de Cambio Climático: Impacto en la agricultura
del Perú

Global impact of climate change

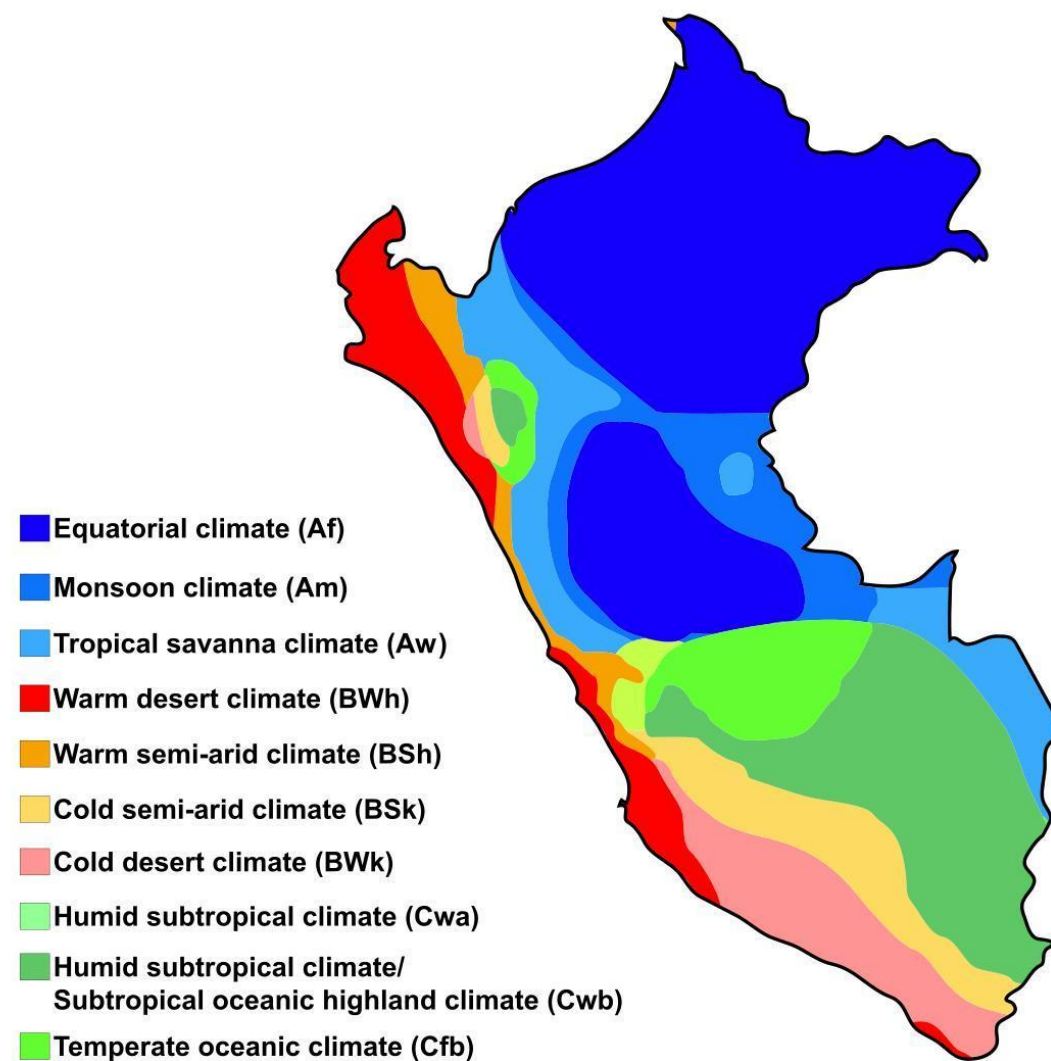
Estimated impact of +3 degrees C change on crop yields by 2050



Source: World resources institute



Peru map of Köppen climate classification



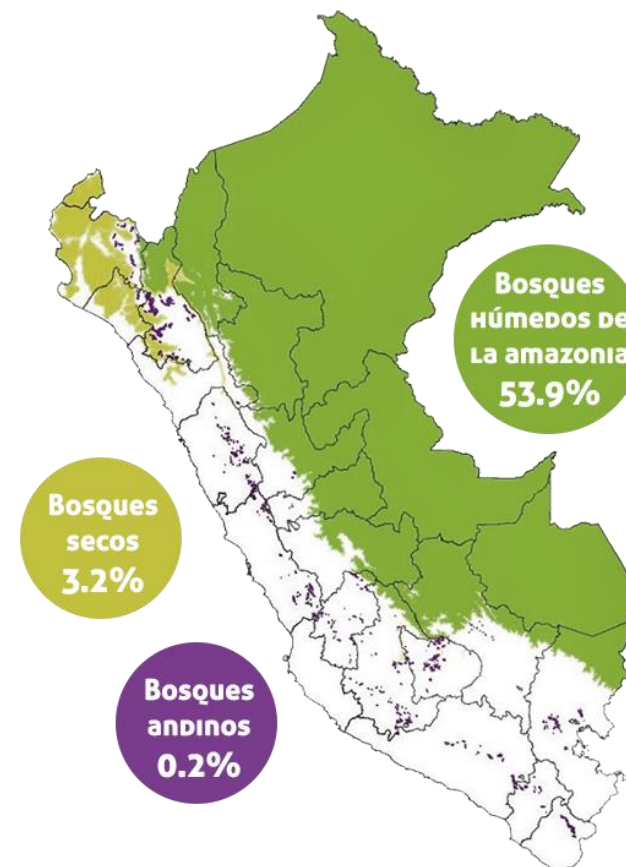
Crop land and forest



Data > Data Catalog > World Development Indicators > Tables > 3.1

	Rural population		Rural population growth (annual %)	Land area	Forest area	
	% of total			sq. km thousands	% of land area	
	2000	2016	2016	2016	2000	2016
Paraguay	40	33	0.6	337.3	40.7	37.7
Peru	27	22	0.7	1,280.0	59.5	57.7

Land use				Arable land	
Permanent cropland		Arable land		hectares per person	
% of land area		% of land area			
2000	2016	2000	2016	2000	2016
0.2	0.2	1.0	12.1	0.07	0.11
0.7	1.1	3.4	2.7	0.17	0.11



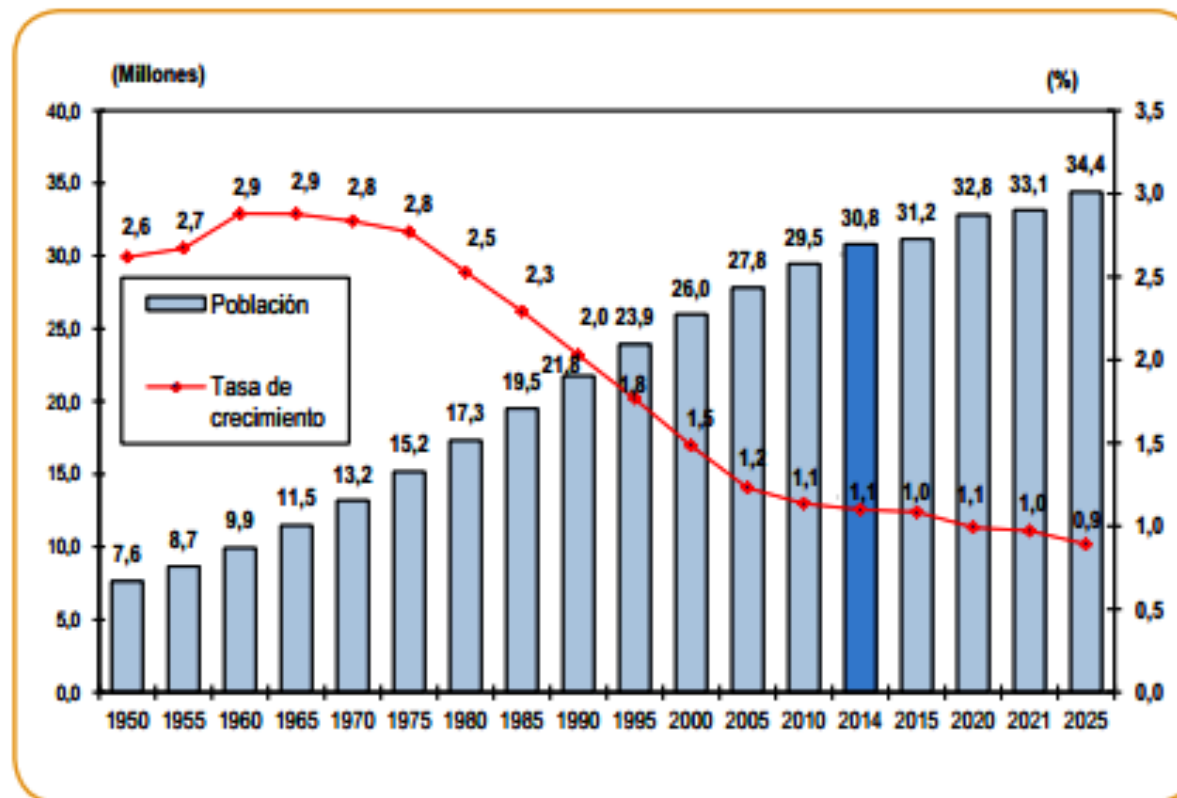
Population



Next 50 years

- ✓ More than 34 millions
- ✓ Food demand
- ✓ Cultural factor: potato, rice
- ✓ 80% PBI: Minnin
- ✓ Drought

PERÚ: POBLACIÓN Y TASA DE CRECIMIENTO, 1950-2025



Fuente: Instituto Nacional de Estadística e Informática.

- ✓ Lower rainfall
- ✓ Strong rainfall episodes
- ✓ Cold Climate
- ✓ Drought

[illegible]

Fuente: SENAMHI

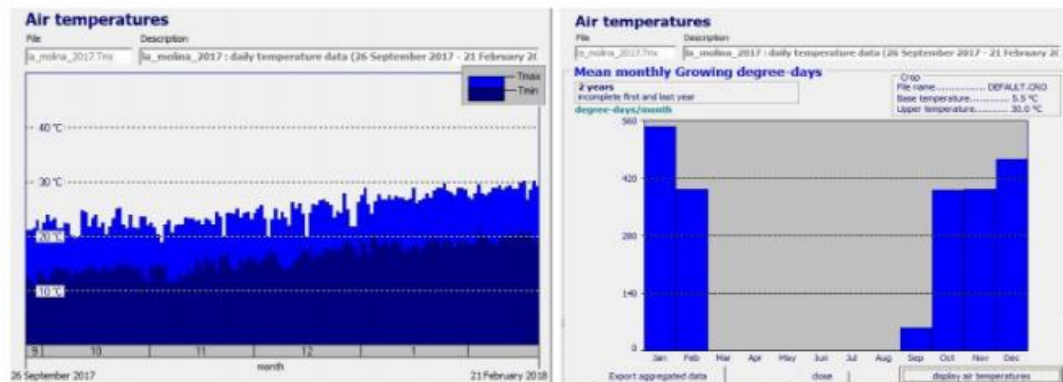
Challenges for Peruvian agriculture

- ✓ Screening for more adaptable crops varieties
- ✓ Modelling most important crops to select best choices
- ✓ **Validate models with field data**
- ✓ Use technology + heritage crop knowledge
- ✓ Public policies in: agriculture, water management and education
- ✓ Agriculture waste for fertilization

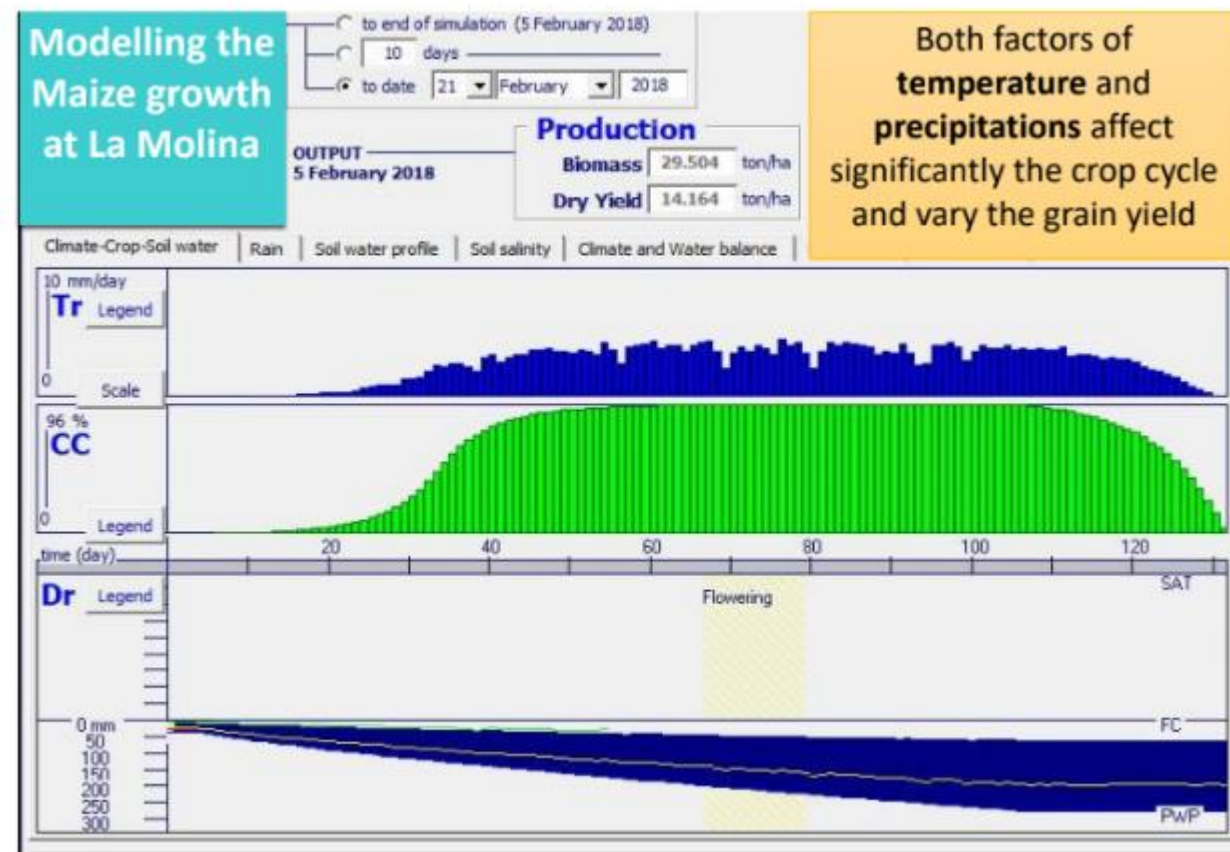
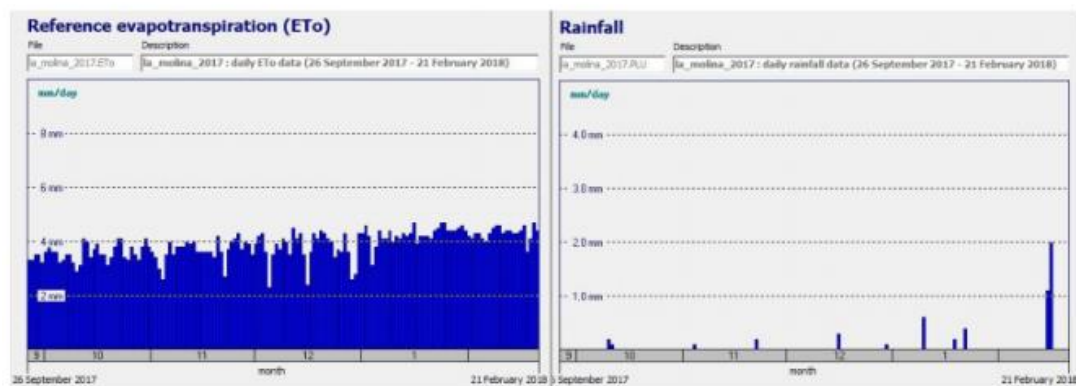
Screening for more adaptable crops varieties

- ✓ Drought
- ✓ Over Watering
- ✓ Response to Low temperatures
- ✓ Future Climate conditions
- ✓ Enhance productivity and quality
- ✓ Regional varieties
- ✓ Open to new strategies--- not only yield

Modelling the crops to select best choices



Modelling the climatic conditions, the temperature determines the growth of maize using the growing degree days to realize the crop cycle variation.

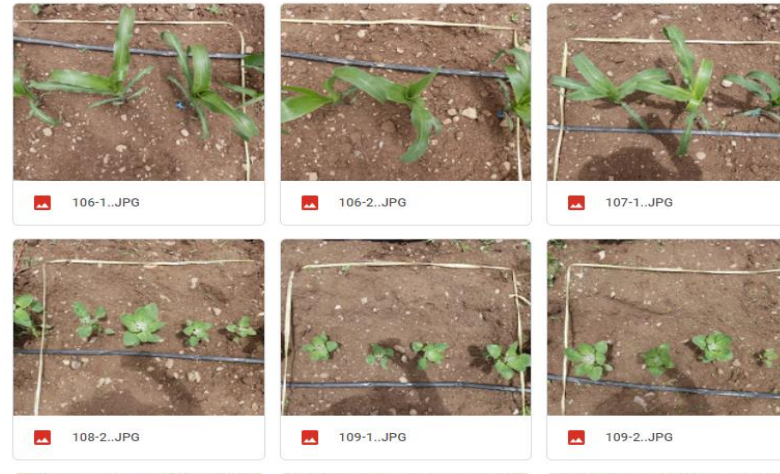


Both factors of temperature and precipitations affect significantly the crop cycle and vary the grain yield

✓ Acucrop Modelling at La molina station 2018 - maizec

Validate models with field data

- ✓ Drought
- ✓ Over watering
- ✓ Response to Low temperaturas
- ✓ Future climate conditions
- ✓ Enhance productivity and quality
- ✓ Regional varieties
- ✓ Open to new strategies--- not only yield



- ✓ Modelling
Maize and
Quinoa at Santa
Ana station -
Huancayo

Use technology + heritage crop knowledge

- ✓ Imaging – Drones, cameras
- ✓ Photosynthesis – CIRAS 3
- ✓ Transpiration- Porometer
- ✓ Lab simulation- Chambers
- ✓ Yield stimation



- ✓ Work with Farmers, heritage knowledge

Work with Farmers, heritage knowledge



Public policies in: agricultura, water management, education

- ✓ Cosecha de agua en cuencas altas
- ✓ Water storage
- ✓ Co-work:
- ✓ Agriculture + water management



GOBIERNO REGIONAL CUSCO
INSTITUTO DE MANEJO DE AGUA Y MEDIO AMBIENTE



SIEMBRA Y COSECHA DE AGUA COMO MEDIDA DE
ADAPTACION FRENTE AL CAMBIO CLIMATICO,
CASO: CUENCA DE LA LAGUNA QUESCAY.

Agriculture waste for fertilization

- Organic fertilizer as possible
 - Agriculture waste management
-
- Education, to value the Smart food, and the efforts of farmers.

Gracias por su atención
Thanks 😊

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