

StateO

5-7 May 2026 | ESA-ESRIN | Frascati (Rome), Italy



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Mapping minor and mixed crops in Zambia and Zimbabwe using ESA WorldCereal crop classification system

Gerald Blasch (CIMMYT)
Shabarinath S. Nair (University Strasbourg)
Jeroen Degerickx (VITO)





Combatting overreliance on a few staple crops (maize, wheat, rice)

Re-introducing neglected crops which are:

- Adapted to local conditions
- Highly nutritious

Monitoring the success of the program?



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Supporting field data collection



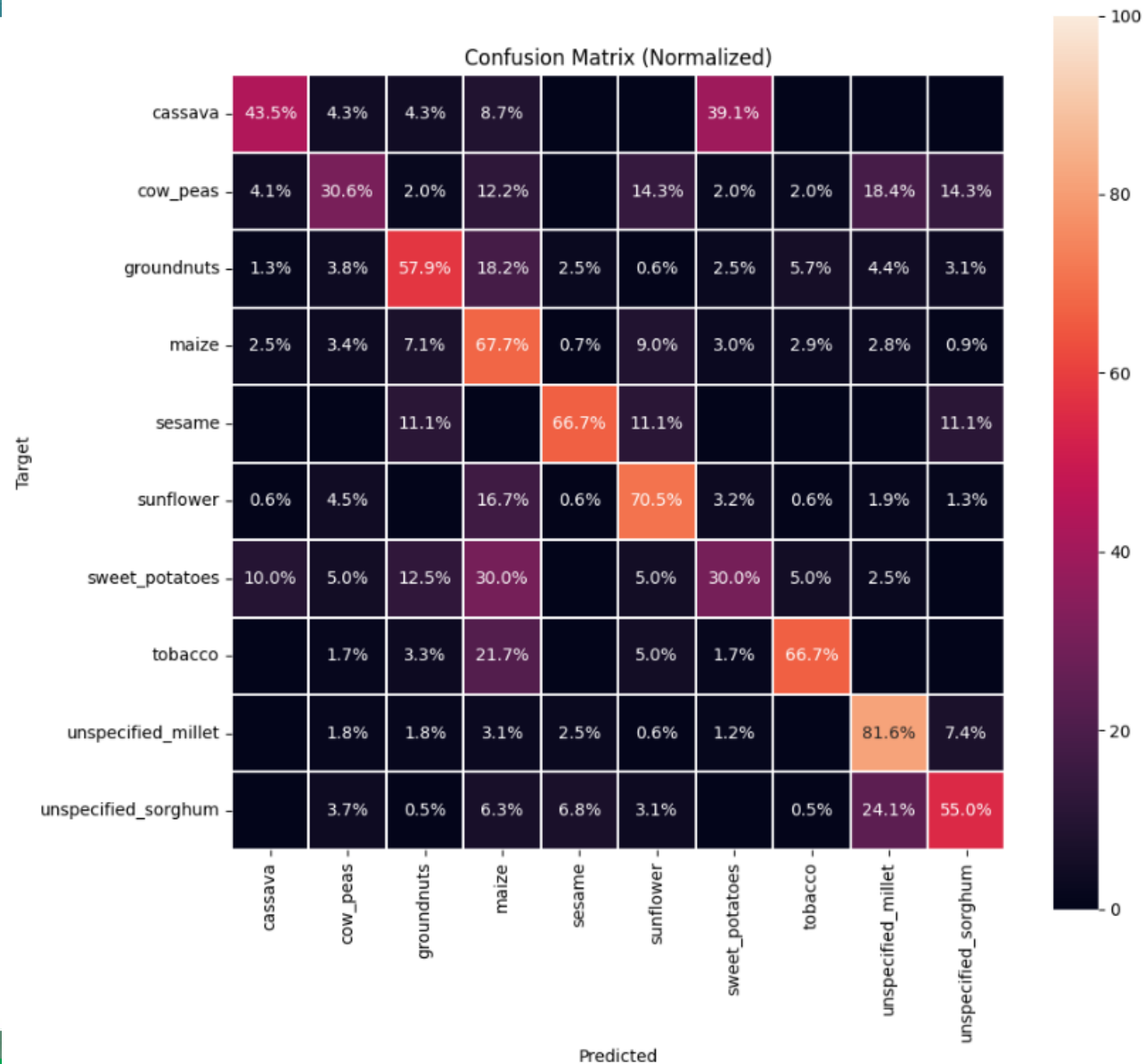
Hands-on training on crop mapping in Lusaka



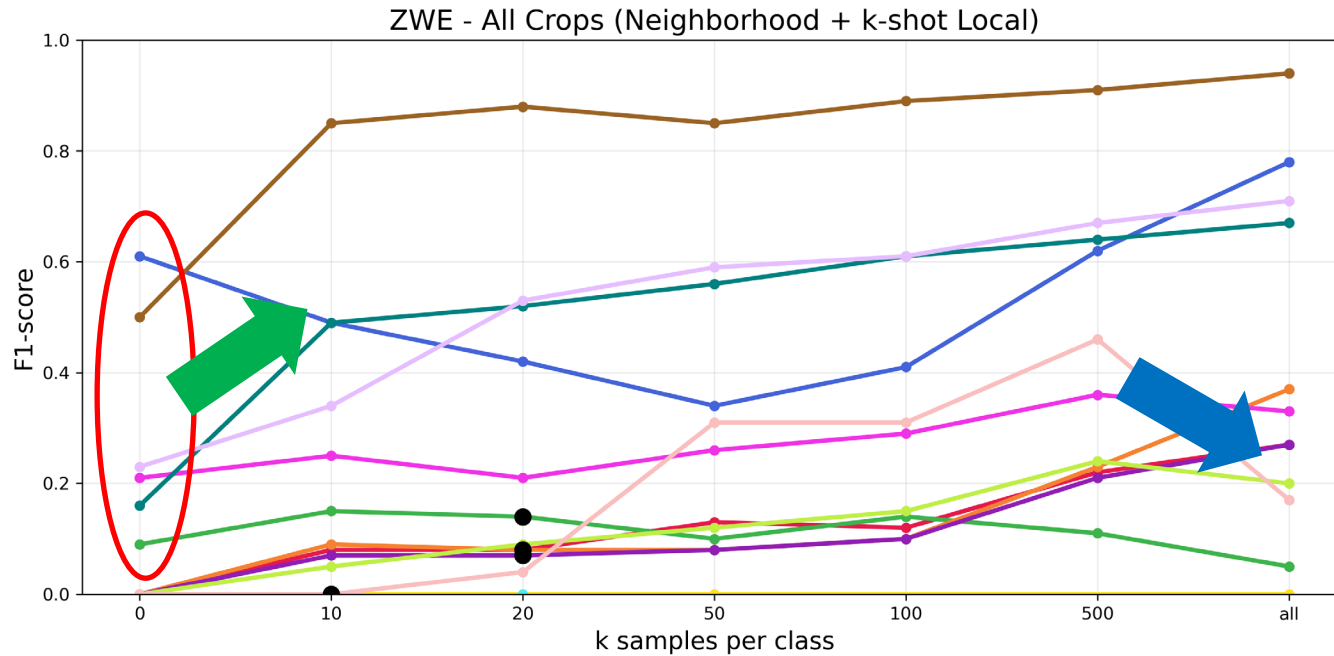
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Possible to map minority crops?

Crop	F1-score	Support
Maize	0.77	1484
Millet	0.66	163
Sorghum	0.62	191
Sunflower	0.52	156
Tobacco	0.51	60
Groundnuts	0.50	159
Sesame	0.25	9
Cassava	0.25	23
Cow pea	0.21	49
Sweet potatoes	0.20	40



Impact of adding local data?



k = 0, only data from neighboring countries...

Accuracy quickly rises upon adding local data

Performance going down when class imbalance increases

Crop (test + train counts)

- cow_peas (test=104, train ALL=547)
- groundnuts (test=145, train ALL=1790)
- maize (test=2126, train ALL=17997)
- maize_mixed_with_cowpea (test=75, train ALL=154)
- maize_mixed_with_groundnut (test=22, train ALL=139)
- other (test=577, train ALL=5632)
- pigeon_peas (test=0, train ALL=36)
- sesame (test=17, train ALL=68)
- soy_soybeans (test=62, train ALL=3904)
- unspecified_millet (test=906, train ALL=1156)
- unspecified_sorghum (test=855, train ALL=1269)
- wheat (test=241, train ALL=263)
- maize_mixed_with_pigeon_peas (train ALL=62)

■ Max available samples

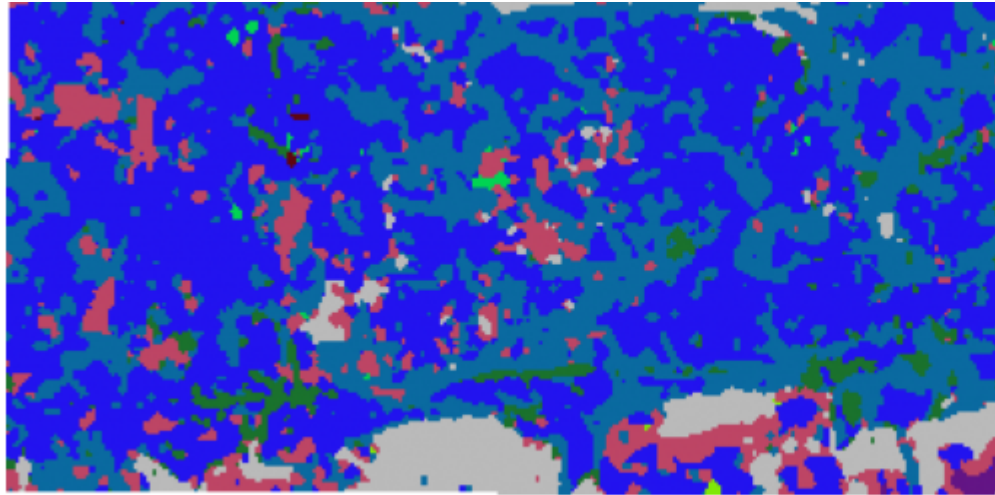
All - All available samples of the crop is used



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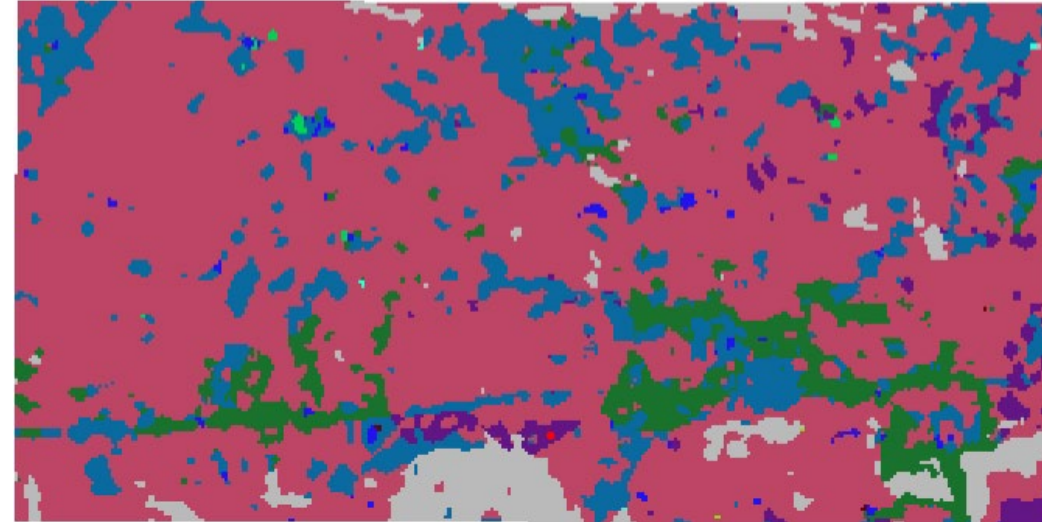


Do not stare blindly at the final crop maps



2020

Millet, cowpea, maize



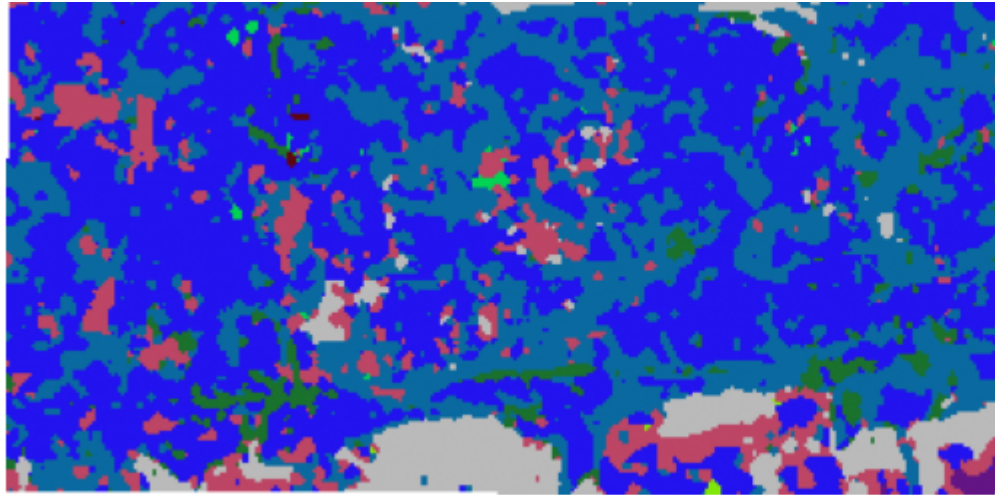
2025

Maize, cowpea, cassava



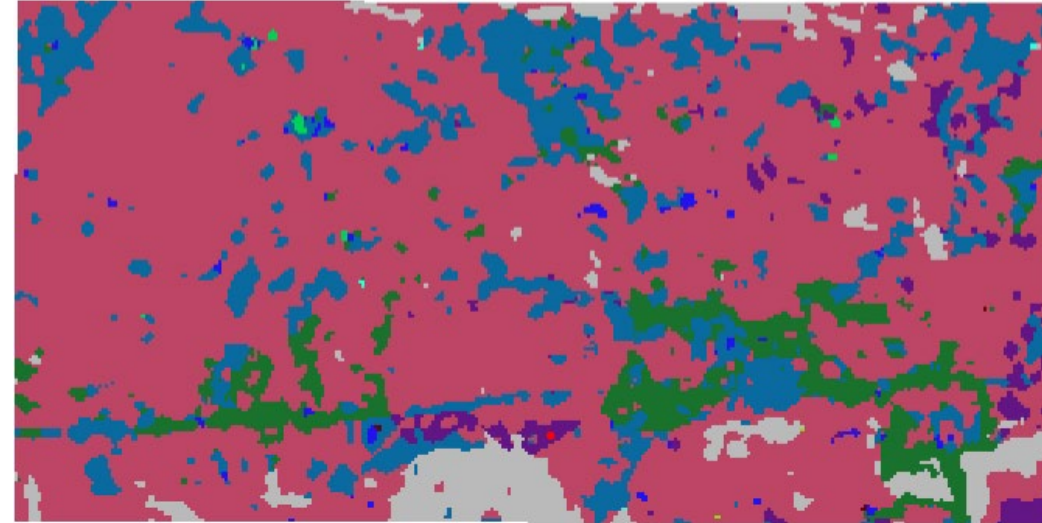
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Look at specific crop probabilities through time!

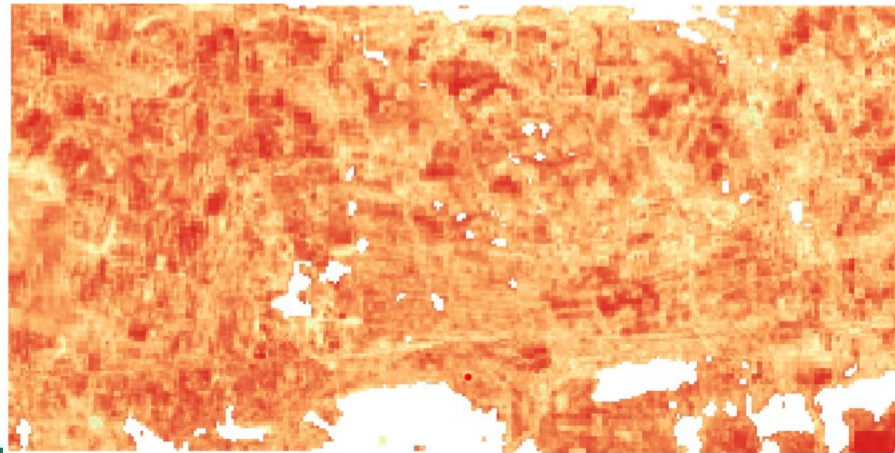


2020

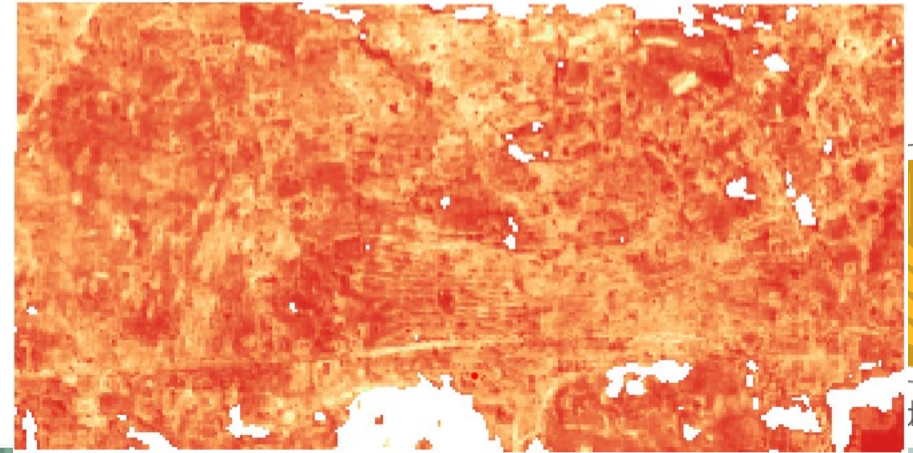
- no_data
- no_cropland
- unspecified_sorghum
- unspecified_millet
- tobacco
- sweet_potatoes
- sunflower
- sesame
- maize
- groundnuts
- cow_peas
- cassava



2025



Probability
cow pea



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What about mixed cropping?

Maize

Cow pea

Maize ~~X~~ cow pea

...



50% Maize + 50% cow pea

Crop probabilities can be used to capture crop mixtures??



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We haven't "solved" crop mapping yet!

Obtaining high-quality reference data in complex agricultural landscapes is challenging!

Second field campaign ongoing, focusing on minor crops

"One-shot" partnerships are not sufficient, need iterations and feedback loops!



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THANK YOU

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<https://rdm.esa-worldcereal.org>

<https://vdm.esa-worldcereal.org>

<https://hub.esa-worldcereal.org>

<https://github.com/WorldCereal/worldcereal-classification/>

<https://worldcereal.github.io/worldcereal-documentation/>

<https://forum.esa-worldcereal.org/>

Code & demo



Documentation



User forum



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