



Innovative IPM Solutions for Winter Wheat-based Rotations (WP2): Cropping Systems Assessed in the INRA Trials (France)

Caroline Colnenne-David, Gilles Grandeau, Véronique Tanneau, Lucie Lefèvre, Thierry Doré

► To cite this version:

Caroline Colnenne-David, Gilles Grandeau, Véronique Tanneau, Lucie Lefèvre, Thierry Doré. Innovative IPM Solutions for Winter Wheat-based Rotations (WP2): Cropping Systems Assessed in the INRA Trials (France). PURE Congress 2015: IPM innovation in Europe, Jan 2015, Poznan, Poland. <hal-01357977>

HAL Id: hal-01357977

<https://hal-agroparistech.archives-ouvertes.fr/hal-01357977>

Submitted on 31 Aug 2016

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Innovative IPM Solutions for Winter Wheat-based Rotations (WP2): Cropping Systems Assessed in the INRA Trials (France)

Colnenne-David C.^{1,2}, Grandeau G.^{1,2}, Tanneau V.^{1,2}, Lefèvre L.^{1,2}, Doré T.^{2,1}

¹ INRA, UMR 211 INRA/AgroParisTech, France (caroline.colnenne@grignon.inra.fr) ² AgroParisTech, UMR 211 INRA/AgroParisTech, France,

OBJECTIVE

Within the context of the PURE project (WP2), innovative IPM solutions were designed, tested and validated for winter wheat-based rotations in different pedoclimatic conditions in Europe.

In each location, three cropping systems (C.S.) were designed according to a gradient of pesticide-use intensity: (1) current agricultural practices with a conventional use of pesticides, (2) intermediate level of IPM with a reduction in pesticide use and (3) advanced level of IPM where no pesticides are allowed.

➤ Here, we describe the field trials and the main characteristics (*i.e.* agricultural practices) of the three cropping systems assessed in the INRA long-term field trials in France.

LONG-TERM FIELD TRIALS AT INRA (France)

✦ Trial network locations in Europe - WP2 (on-station)

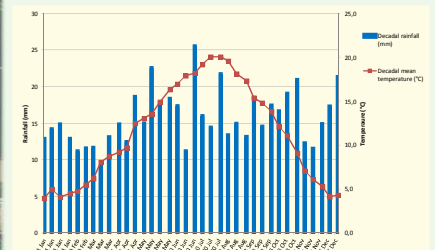
✦ INRA trials



Field trial located in Grignon (A.S.: Advanced System; I.S.: Intermediate System)



Field trial located in Versailles (C.S.: Current System)



Means of rainfall and temperatures in Grignon and Versailles (1993-2013)

MAIN CHARACTERISTICS OF THE 3 CROPPING SYSTEMS ASSESSED

(Colnenne-David C. and Doré T., 2014)

CURRENT SYSTEM (C.S.)

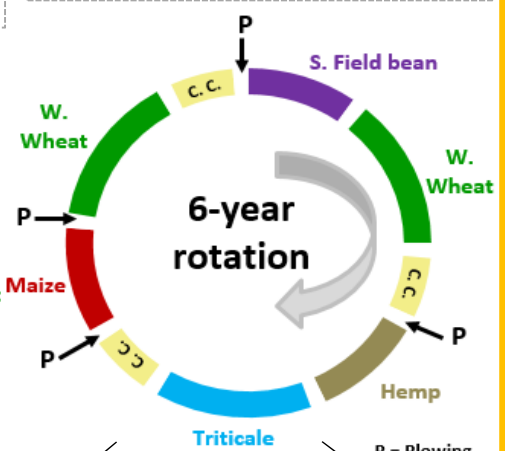
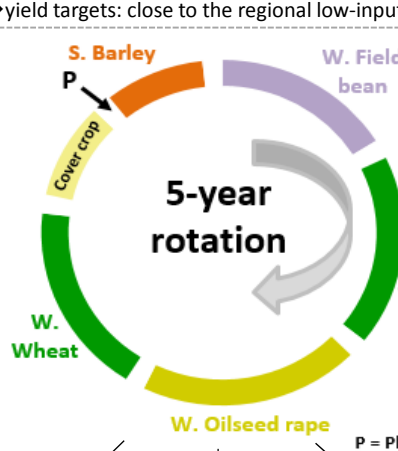
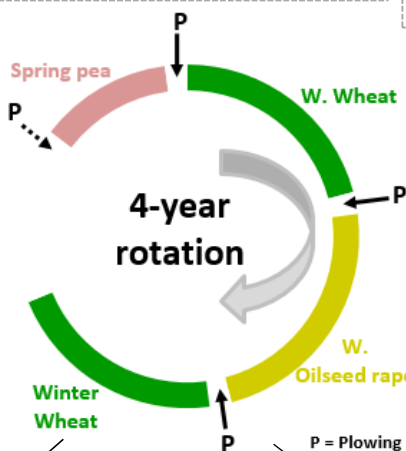
The C.S. was designed to maximize gross margin in bread wheat-based rotation:
 ➔ high amount of pesticides allowed
 ➔ yield targets: close to the current regional system

INTERMEDIATE SYSTEM (I.S.)

The I.S. was designed with:
 ➔ multiple environmental targets (*i.e.* to reduce pesticide use, to lessen energy consumption, to decrease N leaching, to stabilize the amount of soil organic matter)
 ➔ yield targets: close to the regional low-input C.S.

ADVANCED SYSTEM (A.S.)

The A.S. was designed with:
 ➔ a pesticide constraint: no pesticide is allowed
 ➔ multiple environmental targets (*i.e.* see I.S.)
 ➔ yield targets: higher than the regional organic C.S.



TFI ha ⁻¹ year ⁻¹ : 4.64	N fertilization: 147 kgN ha ⁻¹ year ⁻¹	TFI ha ⁻¹ year ⁻¹ : 1.85	N fertilization: 57 kgN ha ⁻¹ year ⁻¹	TFI ha ⁻¹ year ⁻¹ : 0.00	N fertilization: 28 kgN ha ⁻¹ year ⁻¹
Winter Wheat yield: 9.77 t ha ⁻¹		Winter Wheat yield: 8.56 t ha ⁻¹		Winter Wheat yield: 7.53 t ha ⁻¹	

Mean values are calculated at rotation scale

REFERENCE: Colnenne-David C., Doré T., 2014. Designing innovative productive cropping systems with quantified and ambitious environmental goals. "Renewable Agriculture and Food Systems". doi:10.1017/S1742170514000313

ACKNOWLEDGEMENTS: The PURE project is supported by the European commission through the seventh framework program (FP7/2011-2014) under contract number 265865.

PURE Congress 2015: IPM innovation in Europe, Poznan (Poland)

