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Conservation Agriculture and the CAP 2020

Structural Diversity of Rural Areas and Natural Constraints

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Within the complexity of objectives of CAP reform towards 2020 outlined in its communication to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions (COM(2010) 672 final), the EU Commission stresses on several occasions the need for territorially balanced agriculture thereby maintaining and promoting diversified farming systems and land use.

To ensure sustainable and integrated rural development, thus maintaining the structural diversity of predominantly rural areas, a functioning and active agricultural sector is required. However, this goal cannot be achieved without substantially improving the competitiveness of an agricultural sector that is subject to a more competitive environment, as the global economy becomes increasingly liberalized. It is therefore essential to either reduce production costs or produce more from the same inputs. Ideally, the achievement of both goals would boost competitiveness and avoid land abandonment and standardization of agricultural activities. How CA is able to contribute to the improvement of competitiveness both through the reduction of production costs and the increase in productivity (efficiency) and thus farm income is explained in detail in the respective subchapters of this publication.

A contribution to balanced territorial development of rural areas in the EU can be achieved, not only through the establishment of links between rural and urban areas, but also, through the reduction of the effects of natural constraints in agriculture. Natural constraints, or Less Favoured Areas (http://agrienv.jrc.ec.europa.eu/Common%20Criteria%20Fact%20sheets.pdf), suffering from climate, soil, and terrain induced constraints, will always lag behind regions with favourable natural conditions in terms of agricultural activity and competitiveness. Nonetheless, the use of CA can counteract and alleviate the effects of some of these constraints and help reduce the risk associated with them.

In regions with pronounced seasonal water scarcity or low and erratic rainfall water use efficiency can be dramatically improved by the practice of CA, mainly through the adoption of low soil disturbance with and soil organic matter cover, both of which contribute to increased infiltration and the reduction of unproductive water loss through soil evaporation. Higher and more stable crop yields have frequently been observed under CA, in dryland areas and in drought affected years (Peterson & Westfall, 2004; Cantero-Martinez et al., 2007). This improved water use efficiency may reduce water requirements for a crop by about 30 %, regardless of whether crops are under irrigation or rain fed (Bot &Benites, 2005). Similarly, there is improved nutrient use efficiency under CA which is known to reduce nitrogen application by 30-50% (Cantero-Martinez et al., 2007)

Natural soil constraints are often considered as being restricted to deficient drainage, extreme soil texture (sands or heavy clays), effective soil or rooting depth, or chemical properties such as salinity, sodicity, acidity, or other forms of toxicity. Although identified in the Soil Thematic Strategy (http://eusoils.jrc.ec.europa.eu/esdb_archive/policies/stsweb/vol3.pdf) as one of the major threats for European soils, the decline and the low levels of soil organic matter are generally not being addressed as one of the major natural constraints. However, the soil's fertility and capacity to produce are intrinsically linked to its level of organic matter as all

important soil properties and functions (water retention, nutrient cycling and availability, microbial activity, filtering and buffering capacity, degradation of organic compounds, etc.) improve with the amount of organic carbon retained therein. Higher levels of soil organic matter may even compensate, to some extent, for other soil constraints and allow for a reduction in mineral fertilizers inputs.

CA has proven to be the most promising practice capable of reversing SOM decline and the associated loss of soil fertility. Therefore, the continuous payment of 'unproductive' compensation for production difficulties in areas with specific natural constraints could be replaced by an investment in incentives to improve natural soil resources through the increase of SOM, providing both a physical and economic return in the medium to longer term.

The slope of land terrain can also present an impediment for agricultural land use, either through increased difficulty with mechanized field operations, or through an increased rate of surface runoff combined with the risk of soil erosion or landslides. Regarding the latter, the practice of CA is capable of reducing the risk of soil erosion and landslides even on heavily undulated land, thus allowing for crop production instead of marginal or extensive land use through permanent pastures.

This indicates that the impact of natural constraints, whether regarded in isolation or in combination, may vary according to the production system and technological practices used. The application of the principles of CA, together with good agricultural practices such as adapted seeds, integrated pest, nutrient, and water management, timeliness of and trafficability for field operations, enable the farmer to counteract conditions perceived as natural constraints under the conventional tillage system. For example, the time available after harvest under cool and moist conditions may not allow the establishment of a winter crop using conventional soil tillage for seed bed preparation. The conservation or loss of soil moisture in spring through no-till or conventional seedbed preparation can often be decisive for the success or failure of a spring crop under rainfed conditions. Another, often neglected aspect with regard to overcoming natural constraints, results from the soil's bearing capacity under CA conditions. Whereas under the conventional system crop establishment and field operations may have to be delayed or even cancelled mainly due to unfavourable soil moisture conditions, CA allows farm traffic almost continuously thereby allowing for the minimum use of inputs such as fertilizers and plant protection products.

Finally, farming under natural constraints means an increased risk of crop failure. One of the best strategies to reduce this risk is to minimize expenditure until the farmer has a better idea of the yields that can be expected. Therefore, cost reduction in the establishment phase of a crop is essential to meet the goal of risk reduction.

References

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