

Project Title : Management, Mapping and Detection of Resistance Barnyard Grass (*Echinochloa* spp.) in Rice fields and Rye Grass (*Lolium* spp.) in Wheat Fields, They Created Against to Acetolactate Synthase (ALS) Inhibitor Herbicide in Marmara Region

Start Date : 2014

Supporting Body : GDAR (General Directorate of Agricultural Research and Policy)

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Summary : Wheat and rice, with the highest total planting and production areas are the main fundamental nutrition of all nations. Worldwide in Turkey wheat, with a total production area of 8.096.000 hectares is of big importance for national agriculture. Balıkesir and Çanakkale provinces with 1.249.412 and 745.657 da respectively, are the main wheat producers of Marmara region (Anonymous, 2013). The 98.400 hectares Rice cultivation area and production of 900.000 tons is one of the major agricultural products. Approximate yield of 906 kg / ha is by regions rice production 70.2% of Marmara, 26.6% accounted Black Sea and 3.2% in the other regions, including the production of more Marmara and Black Sea regions seem to be committed (Anonymous, 2013).

Directorate of Plant Protection Research Station located within the jurisdiction of the province of Balıkesir and Çanakkale, total 26.580 hectares in 2012 to 191.513 tons rice were produced.

In wheat and rice fields the chemical control is the main method of controlling the harmful effects of the weeds. But, when used improperly and excessively herbicide can cause the occurrence of herbicide resistance.

ALS inhibitor herbicides after their first introduction to Turkey in 1984, become commonly used herbicides for weed control of wheat areas of Marmara region.

As these developments depending in the world, in our country resistance of development as determined and in same region is thought to be resistance development such as wheat field problems in the broad-leaved weeds *Sinapis arvensis* (wild mustard) 's ALS inhibitor herbicide that the strength (Topuz, 2007) the emergence of *Avena fatua* and *Avena sterilis* in determining it resistance to ACCase inhibitor herbicides (Türkseven, 2011)

The ability of rigid ryegrass (*L. rigidum*) and barnyard grass (*Echinochloa crus galli*) to rapidly evolve resistance, and at the same time it's ability to evolve resistance to herbicides with different mode of actions makes it's control in wheat and rice very difficult.

In this study, the Marmara region in Canakkale and Balıkesir province with intensive wheat farming areas, between the years of 2015-2018, *Lolium* spp. (ryegrass) of the sulfonyleurea group of mesosulfuron-methyl + iodosulfuro-methyl sodium in wheat and the *Echinochloa* spp in paddy fields. (Barnyard grass) 's belong to the group of sulfonyleurea ALS group azimsulfuron, Bispyribac-sodium, Bensulfuron-Methyl, Cyclosulfamuro the resistance Penoxulam determining whether or not they are intended.

This study will be starting with collecting of a *L. rigidum* seeds in wheat fields and *Echinochloa* spp. seeds from the rice fields of Çanakkale and Balıkesir provinces of Marmara region with a history of a consecutive use of sulfonyleureas and collecting of control seeds from the areas with no history of any herbicide uses. First the occurrence of resistance to chlorsulfuron and will be tested, next in case the resistance has evolved, its geographical spread will be mapped and with use of herbicides with different modes of action the occurrence of cross or multiple resistance will be evaluated. Furthermore with aim to verify the mechanism of resistance, molecular work on ALS gene level will be conducted with rigid ryegrass and barnyard grass resistant R and susceptible (S) biotypes. Also fitness studies will be important part of the project.

With the data and results obtained from the project the resistance map of the above mentioned areas will be drawn and management strategies with the aim to reduce the spread the resistance such as alternatif control methods will be implemented.

The findings obtained from this study will be created with the alternative control methods, resistance occurring in areas related to resistance management, endurance, resistance formation does not occur in areas of preventive advice will be created. Moreover, the results will be share with technical staff and farmers.