

Success story of participatory evolutionary cereal breeding in drought-stress environments of Iran¹

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In 2008-2009 we started an evolutionary plant breeding (EPB) program for rainfed barley utilizing 8 kg of a mixture of 1600 F₂ populations received from ICARDA. The seed was planted in a farmer's field in Dalahoo region, Kermanshah, West Iran. In spite of late sowing, undesirable in that cold region, the farmer noted its good performance and in 2009-2010, he planted the harvested seed on half hectare. The evolutionary population out-yielded the local barley and performed almost as well as the improved barley cultivar, Sararood-1. The farmer was satisfied with the population's performance even in a dry season, and now he planted it in commercial area and distributed the seed to other farmers. Based on the success of EPB with barley, in 2009-2010, we decided to establish the same program for bread wheat. Because we could not get a wheat evolutionary population from ICARDA, we used the backup bread wheat seeds conserved in the seed store, together with seeds from segregating populations from the wheat breeding program of the Dryland Agricultural Research sub-Institute, Kermanshah, Iran. The evolutionary population was planted in a farmer's field in Sahne region in Kermanshah province. In 2009-2010, there was a severe epidemic of yellow rust and widespread lodging problems in both rainfed wheat and barley. However, the bread wheat evolutionary population showed resistance to both rust and lodging, and yielded 3500 kg/ha. The local check, Sardari, a widely adapted cultivar representing about 80% of the dryland wheat in Iran, planted in an adjacent field, yielded 1500 kg/ha and showed susceptible reaction to rust and lodging. In 2010-2011, a dry cropping season, the evolutionary population out-yielded again Sardari. The same success stories are being heard from farmers in the Semnan province, where the evolutionary populations of barley and wheat, grown under irrigated condition show good yield, higher resistance to pests, lower infestation by weeds, as well as better bread quality.

1 This poster has been accepted for the Inter-Drought IV Conference, 2-6 September, Perth, Australia.