



ICARDA
Science for Better Livelihoods in Dry Areas



Lebanon Report_ cropping season 2019-2020

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The Lebanese Agricultural Research Institute (LARI) started to work with wheat and barley improvement since its establishment in the sixties. LARI is the governmental body to release and produce the seeds. Historically, LARI and ICARDA were working jointly and strong collaboration had been made in variety release from ICARDA germplasm such as Berdawni, Ghzael, Massara, as durum wheat. Lebanon is well known for producing more durum wheat than bread wheat with a percentage of 70 to 80% depending on the year.

Following DIIVA-PR agreement, the trials were carried out in two sites Tal Amara (Supplemental irrigation: N 33.36117, E 35.9912 and elevation 936 m) and Akkar (Tal Abbas N 34.564436, E 35.993092, and elevation 30 m) as a conducive environment for early onset of the disease and good scoring of the three rusts and especially for stem rust (SR) infection (TKKTF race).

Lebanon Multi-Locations Variety trial (LMVT-19) trial derived from 12 entries and Crop Wild Relatives, trial (CWRT-19) trial derived of 24 entries were planted in 3 replications alpha Lattice across the two sites in plots. Planting was done on December 7 and January 19 for Akkar and Tal Amara respectively. Germination was observed in Akkar on December 15 and in Tal Amara on February 10th.

Agricultural practices were applied timely: Fertilizers, herbicides spraying, hand weeding and supplemental irrigation.

Observations were taken: Date to maturity, plant height, number of spike in 1 linear meter, thousand kernel weight, visual color, and rusts scoring.

Unfortunately, the season in Akkar could not reach till harvesting and were not able to take the yield parameters; although, we were keen to score the disease that appeared in early April just before destroying and burning the field. The entries performed differently to the diseases. Massara, a Lebanese released variety showed high a level of susceptibility to stem rust in Akkar and this suggests the withdrawal of this cultivar from farmers especially in coastal areas and areas with supplemental irrigation in spite of being the earliest in flowering and maturing. In Tal Amara, Margherita was superior to Massara with a 6% yield gain over Massara.

In terms of grain size, both entries Margherita and Zagharin-2 were superior to the check Berdawni.



For phenology, both entries were within the values of the commercial checks, with Maasara being the earliest, then Margherita, Zagharin2, and Berdawni the latest flowering and maturing. For plant height, Maassara was the tallest, followed by Margherita and Berdawni, then Zagharin 9 cm shorter at 88 cm. For stem rust, IDYN49-036 scored as 60S and shall not be considered further in other LMVT. Cucaraja, Icaverve, and Azizera reached 30 to 40MR reactions, which are perfect for farmers adopting fungicide spraying. Icaqinzen, Berghisyr, Youssara, and IDYN49-018 all scored as resistant.

Margherita and Zagharin2 scored the highest for yellow grain color and virtuousness, important traits for transformation.

For CWRT-19. We succeeded to score the rust at the hot spot in Akkar: Many genotypes showed a high level of resistance and even immune to the prevalent race in the region of stem and leaf rusts such as Nachit, Zagharin-2, Icaverve, Sahi. Zeina, whereas ADYTM18-099 and DAWRyt123 showed a high level of resistance to stem rust and moderate level to leaf rust. Therefore, the mentioned genotypes showed performance to stem rust and might be incorporated in the coming years in LMVT trials considering the resistance to rusts.

When we combine our results with Dr. F. Bassi from other stations: Terbol, Kfardan, Tal Amara, and Akkar and the recommendations are as follows:

- **Margherita will be a new released durum wheat variety for Lebanon which showed stability for rainfed zones and resistance to stem rust in humid zones.**
- **Stop the commercialization of Massara due to its susceptibility to stem rust under supplemental irrigation and humid zones.**
- **Keep genotypes like Zagharin-2, Cucaraja, Azizera, and Berghisyr within LMVT-20 to check their performance in terms of disease resistance and agronomic traits.**
- **Keeping Zagharin-2 on the waiting list for release for the coming year as it out-performed very well along with Margherita.**