

**Table S2.** Harvest results on the local farm in Mecklenburg-Western Pomerania of all cultivated HAPP varieties from previous years (2015-2020) in comparison with experimental data from 2021 for the investigated HAPP *cv.* “Waxy/Henriette” and agrometeorological conditions and irrigation levels: I = irrigation (mm), P = precipitation (mm), TWS = total water supply (mm), T = air temperature (°C), Y = total yield (dt ha<sup>-1</sup>), SC = starch content (g kg<sup>-1</sup>), SY = starch yield (dt ha<sup>-1</sup>). Agrometeorological parameters are shown for the growing season from April 1 until September 30 each year. The total water supply is calculated as the sum of irrigation and precipitation. Starch yield is calculated as the product of total yield and the starch content.

year		I (mm) <sup>1</sup>	P (mm) <sup>2</sup>	TWS (mm)	T (°C) <sup>2</sup>	Y (dt ha <sup>-1</sup> )	SC (g kg <sup>-1</sup> )	SY (dt ha <sup>-1</sup> )
2015-	min	0.0	122.2	248.8	15.3	422.9	167.0	78.6
2020	mean	96.3	194.8	291.1	16.7	492.9	178.3	89.0
	max	144.8	308.0	383.3	17.9	566.2	186.0	105.3
2021 <sup>3</sup>		119.2	255.1	374.3	17.0	559.1	179.9	102.3

<sup>1</sup> In 2015, no irrigation data were recorded.

<sup>2</sup> Agrometeorological data from 2015 to 2020 were recorded with climate station operated by German Meteorological Service [39]. In 2021 and 2022, meteorological data were observed during the field experiments using smart weather sensors (Arable Mark 2, Arable Labs, Inc., Princeton, New Jersey, USA).

<sup>3</sup> In 2021, yield, starch content, and starch yield data are presented from experimental data at the 100 % irrigation level for the investigated HAPP *cv.* “Waxy/Henriette”.