A field experiment was conducted at Wheat and Maize Research Unit, VNMKV, Parbhani during Kharif 2016 to study the effect of micronutrients (Mg, Zn and B) on morphological and physiological characters in sweet corn. The effect of 10 treatments viz., control (T₁), RDF (120:60:50 kg NPK ha⁻¹) (T₂), RDF + 3 Content, through soil (Mg + Zn + B) (20 kg, 20 kg, 5 kg ha⁻¹), respectively (T₃), RDF + Mg (20 kg ha⁻¹) soil application at the time of sowing (T₄), RDF + Zn (20 kg ha⁻¹) soil application at the time of sowing (T₅), RDF + B (5 kg ha⁻¹) soil application at the time of sowing (T₆), RDF + foliar application at 30 and 45 DAS of Mg + Zn + B @ 1% (T₇), RDF + foliar application of Mg at 30 and 45 DAS @ 1% (T₈), RDF + foliar application of Zn at 35 and 45 DAS @ 1% (T₉) and RDF + foliar application of B at 30 and 45 DAS @ 1% (T₁₀) were evaluated for morpho-physiological traits. Results revealed that for chlorophyll content (SPAD) and leaf area at flowering and maturity, treatment T₇ (RDF + Mg SO₄ + Zn SO₄ + B spraying @ 1% at 30 and 45 DAS) (64.87) found significantly superior over rest of the treatments. Further, similar treatment was also found significantly superior over rest of treatments, in respect of cob yield plot⁻¹ (41.93 kg) and cob yield ha⁻¹ (436.80 q) and at par with treatment T₉ (RDF + Foliar application of Mg @ 1% at 30 and 45 DAS) (36.42 kg plot⁻¹ and 379.39 q ha⁻¹ cob yield) and significantly superior over rest of the treatments.