A field experiment was conducted during rabi season of 2016-17 on clayey soil at Instructional Farm, Department of Agronomy, College of Agriculture, Junagadh Agricultural University, Junagadh to study the effect of recommended dose of fertilizer 120:60:60 NPK kg ha$^{-1}$ along with foliar spray of water soluble fertilizers viz., 19:19:19, 13:40:13, 12:61:00, 00:52:34, 28:28:00, 00:00:50:17.5 S, Urea and KNO₃ on growth and yield of sweet corn var. Madhula in randomized block design with three replications. Foliar spray of water soluble fertilizers, urea and KNO₃ were done @ 2 % (20 g liter$^{-1}$ water) with soil application of RDF (120:60:60 NPK kg ha$^{-1}$) at 30, 45 and 60 DAS, the entire dose of phosphorus, potassium and 1/3rd dose of nitrogen was applied as basal. Remaining dose of nitrogen was applied in two splits 30 and 60 DAS.

The experimental result revealed that application of RDF 120:60:60 kg ha$^{-1}$ NPK along with foliar spray of WSF (19:19:19) promoted growth parameters viz., plant height, number of functional leaves per plant, dry matter accumulation, stem diameter, number of internode per plant and leaf area index. Significantly the highest cob length, cob girth, number of cob per plant, number of kernel per plant, number of kernel row per cob, 100- kernel weight, fresh weight of cob, dry weight of cob and grain weight per cob were registered with application of RDF 120:60:60 NPK kg ha$^{-1}$ + foliar spray of WSF (19:19:19).
Significantly the highest crude protein in cob and fodder was recorded with application of RDF 120:60:60 NPK kg ha\(^{-1}\) + foliar spray of Urea. Whereas significantly the highest protein yield was observed in application of RDF 120:60:60 NPK kg ha\(^{-1}\) + WSF (19:19:19). Over the control (T\(_1\)). Higher nitrogen, phosphorus and potassium content in cob and fodder was recorded with application of RDF 120:60:60 NPK kg ha\(^{-1}\) + foliar spray of Urea, WSF 12:61:00 and foliar spray of KNO\(_3\) @ 2% at 30, 45 and 60 DAS, Respectively. Soil application of NPK 120:60:60 kg ha\(^{-1}\) with foliar spray of WSF 19:19:19 recorded the higher N, P and K uptake by cob and fodder. Similarly in case of total uptake of NPK by cob and fodder.

Application of RDF 120:60:60 NPK kg ha\(^{-1}\) + foliar spray of WSF (19:19:19) registered higher green cob and green fodder yields of 7040 kg ha\(^{-1}\) and 38737 kg ha\(^{-1}\), respectively. The highest net return (₹ 65714 ha\(^{-1}\)) and B: C ratio (2.51) was accrued under the same treatment. In contrast, the control (T\(_1\)) recorded minimum net profit as well as BCR. It could be concluded that the soil application of RDF 120:60:60 kg ha\(^{-1}\) NPK along with foliar spray of WSF (19:19:19) @ 2% at 30, 45 and 60 DAS gave higher green cob yield with higher net return of sweet corn in rabi season. This water soluble fertilizer play an offensive role in nutrients and physiology of the crop plants. Therefore, better availability and uptake of nutrients and improving yield and quality of sweet corn was observed under South Saurashtra Agro-climatic Zone.