Maize (Zea mays L.) is worldwide used as food and feed, supplying carbohydrates and proteins. However, it is deficient in two essentials amino acids namely; lysine and tryptophan. Quality Protein Maize (QPM) has about twice the amount of lysine and tryptophan of normal maize and can be used to correct this deficiency in protein quality. It was developed by combining the genetic systems of the mutant opaque-2 (O2) gene and O2-endosperm genetic modifiers. Current efforts are to expand QPM cultivation in regions experiencing malnutrition. In those regions, maize is produced under stresses among which low N and drought are the most prevalent. However, the effects of those two stresses on QPM characteristics are not known. To study how N and drought affect major characteristics of QPM, 14 QPM inbred lines were received from CIMMYT-Kenya and used to produce 41 Single Crosse Hybrids (SCHs). The 41 SCHs and one normal check were evaluated at Kiboko in Kenya in 2005 and 2006 under optimum, low nitrogen and drought environments and at Rubona in Rwanda in 2005 under optimum and low N environments. Observations were performed on endosperm modification, protein and tryptophan concentrations in grain. The results showed that low N partially reduced the action of O2-endosperm modifiers making QPM endosperm partially soft and opaque. Drought suppressed or reduced significantly the action of O2-endosperm modifiers making QPM endosperm chalky, opaque and soft. Low N and drought reduced significantly protein concentration in grain of genotypes including the non-QPM check whereas they increased the levels of tryptophan except for the non-QPM check. It appeared therefore that nitrogen particularly water played vital roles in modification of O2-maize endosperm. Moreover, QPM genotypes did not lose their nutritional advantages in stressed environments. The adverse effects of low N particularly drought on endosperm modification may have negative impact on adoption of QPM in areas prone to the two stresses and where maize is the major source of food because harvested grain will be inappropriate for human consumption. However because of important genetic variability among genotypes, it is possible to select genotypes less susceptible to low N and drought by using optimum and stressed environments.