Alpine has been extensively tested for yield and agronomic characteristics for three seasons (1989–1991) over 26 locations. Alpine averaged 2816 kg ha\(^{-1}\) yield across all 26 environments, outyielded check GN cultivars by 4\%, and was equivalent in yield to navy and pinto bean cultivars of the same maturity class.

Alpine is the first GN cultivar possessing upright Type II growth habit, with plants averaging 50 cm in height, which is 5 cm taller than Starlight. The upright architecture of Alpine, combined with increased height, improved lodging resistance (1.5, vs. 3.0 for Starlight), and higher pod placement will permit the successful production of GN market class in the humid Midwest. Alpine reaches maturity in =93 d, which is equivalent to Starlight, and flowers 45 d after planting.

Alpine carries the dominant \(Ur-3\) resistance gene, which conditions hypersensitive necrotic resistance to U.S. rust races 38 to 42, 52 to 57, 59 to 61, and 68 to 70. Alpine exhibits moderate resistance to the predominant alpha race of anthracnose disease caused by \(Colletotrichum lindemuthianum\) (Sacc. & Magnus) Lams.-Scrib. in Michigan, but is susceptible to bean common mosaic virus and common blight incited by \(Xanthomonas campestris\) pv. \(phaseoli\) (Smith) Dye.

Alpine has a seed size of 35.3 g 100 seed\(^{-1}\) equivalent in size to the standard cultivar UI-59 (34.5 g 100 seed\(^{-1}\)), larger in size than 'Beryl' (33.1 g 100 seed\(^{-1}\)), but smaller than Starlight (41.0 g 100 seed\(^{-1}\)). The size and color are well within the range of acceptability for GN class. Alpine has been rated over 3 yr as exhibiting acceptable processing quality when compared with Beryl and Starlight. This evaluation conducted by the authors in the MSU Food Testing Laboratory is based on whole-bean integrity (no splitting or clumping), uniformity of size (uniform water uptake), and color (no post-harvest darkening), and clear brine (no starch extrusion into canning liquid). Data on cooked color, hydration, and drained weight ratio exhibit no difference between Alpine and Starlight, and texture was 43 kg 100 g\(^{-1}\) well within the acceptable range of 40 to 55 kg 100 g\(^{-1}\) established for processed GN beans.

Alpine has been released as an exclusive variety with a research fee assessed on each unit (hundredweight) of certified seed sold. Variety protection has been applied for under the Plant Variety Protection Act, Public Law 91-577, which was collaboratively released in 1991 by the Rodale Research Center and the University of Nebraska for production and breeding purposes. Plainsman, like other grain amaranths, is a warm-season broadleaf plant that produces seed with high-quality protein (1). Most of the grain amaranth in the USA is currently produced in an area with 350 to 500 mm of annual precipitation. The largest concentration of U.S. grain amaranth production currently is in western Nebraska (2).

Plainsman was developed by the Rodale Research Center, New Crops Department, in Kutztown, PA, and was evaluated in Nebraska as K-343 by the University of Nebraska. Plainsman originated from a cross between RRC1024 (PI 477917) and RRC1004 (PI 540446) made in 1977. RRC1024 (\(A.\) hypochondriacus) is a gold-seeded selection from a landrace cultivar from Mexico. RRC1004 (\(A.\) hypochondriacus) is a black-seeded selection from a landrace cultivar from Pakistan. Plainsman was developed from single plant selections in the F\(_2\) to F\(_{\text{5}}\) generations, followed by mass selection for uniformity in the more advanced generations. Based on floral morphology, Plainsman would be classified as \(A.\) hypochondriacus.

Plainsman was selected for earlier maturity, lighter seed color, and shorter plant height compared with the grain amaranth parent, RRC1024. In evaluation trials at the High Plains Agricultural Lab in Sidney, NE, Plainsman was one of the earliest-maturing grain amaranth lines, requiring =110 d to mature. RRC1024 is a long-season accession that does not reach maturity in western Nebraska. When moisture conditions are not limiting, Plainsman reaches an intermediate plant height of 1.6 m, whereas RRC1024 can grow to 2.2 m.

During the juvenile stage, Plainsman has red pigmentation in the center of its leaves, which fades as the plant approaches its reproductive phase. Plainsman develops a red upright flower and produces light tan seed, commonly referred to as white. Generally <0.5% of the seed is darker tan to brown in color, which is associated with immaturity at frost or harvest. The indeterminate nature of the crop usually results in some of this off-color seed, but it can be highly variable, depending on combine settings, average maturity at frost, and date of harvest. Compared to \(A.\) cruentus cv. MT-3 (3), Plainsman maintains better stem strength after frost. Plainsman segregates for <0.5% green flowers, a trait that is recessive to the normal red flower.

Plainsman is a widely adapted cultivar. It has been grown in test as K-343 from North Dakota to Missouri. It was evaluated in amaranth performance trials and in farmer fields in the Great Plains from 1986 to 1990. Yields have averaged >600 kg ha\(^{-1}\).

The generation sequence of seed production will be breeder, foundation, registered, and certified. This cultivar will not be protected under the Plant Variety Protection Act. Breeder seed is maintained by the University of Nebraska Panhandle Research and Extension Center, Scottsbluff, NE 69361. Foundation seed will be available from the Foundation Seed Division, 3115 N 70, Lincoln, NE 68507-0913.