

Pure Seed Unit 27

The kinds of seed assigned to PSU 27 are members of the Asteraceae (Composite family) with the exception of *Cannabis* (Cannabaceae). The seed unit consists of a single-seeded, indehiscent fruit commonly referred to as an achene. In *Cannabis*, the superior ovary is derived from two carpels that unite to form a one-chambered ovary containing a single ovule (Heywood et al., 2007). The embryo is bent (Martin, 1946) and embedded in oily endosperm (Mabberley, 2017). The fruit is often enclosed in a persistent perianth and bract, which if present is considered to be part of the pure seed unit (Figure 4.27.1).

In Asteraceae, the fruit develops from an inferior ovary composed of two carpels united to form a single chamber containing one ovule (Zomlefer, 1994). The preferred name of the fruit in this family is cypsela because of the inferior position of the ovary as opposed to the superior ovary position in true achenes; however, many botanists have ignored this distinction and have continued to use the term achene for the fruit in Asteraceae (Spjut, 1994). The embryo is straight and usually fills the entire length of the fruit. Endosperm is often reduced to a single layer or two of cells, and the seed coat similarly consists of one or two cell layers, or the inner layer may be reduced to a non-cellular material (Pandey et al., 1978).

For kinds assigned to PSU 27, the pure seed unit may be an intact fruit whether or not it contains a seed, a broken fruit greater than one-half the original size provided a seed is present, a seed (fruit wall removed), or a piece of broken seed greater than one-half the original size (Figure 4.27.2). Other features of the pure seed unit may include the stylopodium (base of the style) located at the apex of the fruit, which may be surrounded by a raised apical rim; at the opposite end, the basal scar representing the point of attachment to the receptacle (Figures 4.27.3 and 4.27.4A and B). Any additional structures attached to the fruit are not considered to be part of the pure seed unit and must be removed during the purity analysis with the exception of the persistent perianth and bract in *Cannabis sativa*. “Rubbed” or milled *Gazania* fruits are assigned to PSU 27 (Figure 4.27.4C); however, for un-milled *Gazania* refer to PSU 28.

Definition of PSU 27

Intact achene whether or not a seed is present.

Piece of broken achene larger than one-half of the original size, unless no seed is present.

Seed, with or without pericarp/seed coat.

Piece of broken seed, with or without pericarp/seed coat, larger than one-half the original size.

Special consideration:

For *Cannabis sativa*, the persistent perianth and bract, when attached to the achene, are considered part of the pure seed unit.

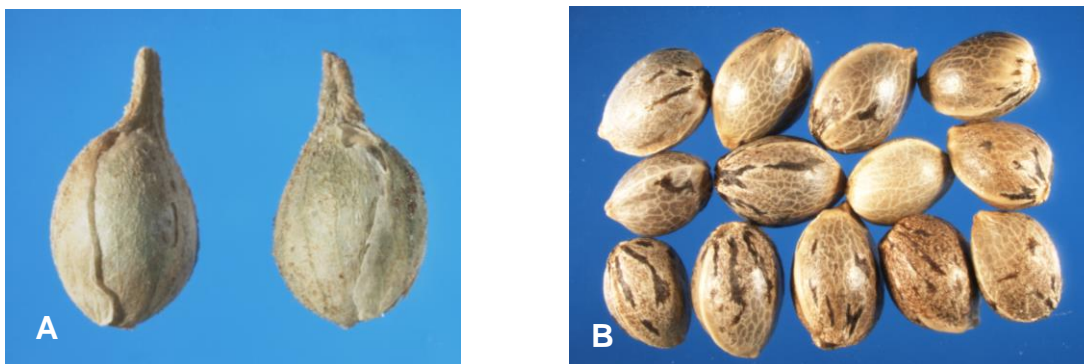


Figure 4.27.1. *Cannabis sativa* (hemp). A – achenes enclosed in a persistent perianth that when attached to an achene is considered to be part of the pure seed unit. B – intact achenes (without perianth) classified as pure seed units.

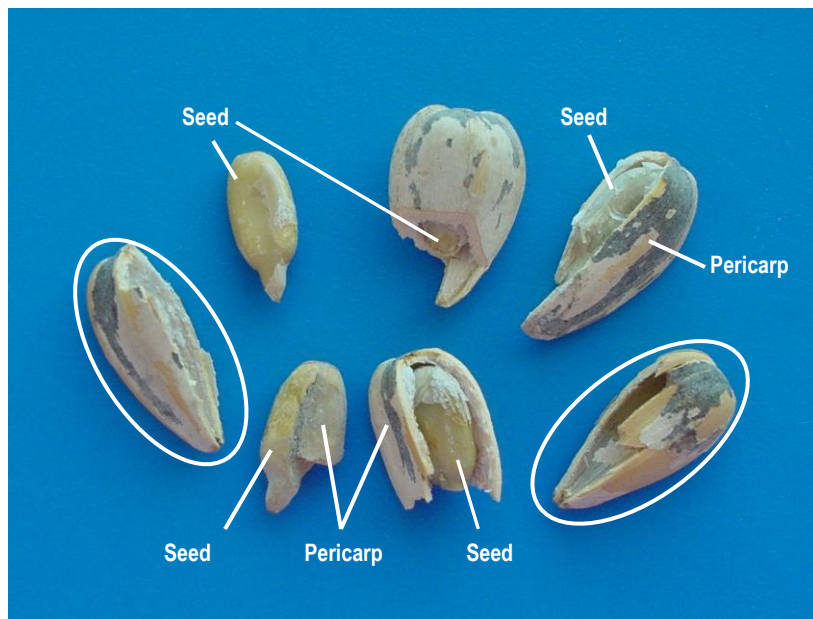


Figure 4.27.2. *Helianthus annuus* (sunflower) pure seed units and inert matter. Circled items are classified as inert matter because the broken fruits do not contain seeds, while the remaining items although broken (except for the seed at upper left) are classified as pure seed because they are larger than one-half the original size and contain a whole seed or portion of a seed.



Figure 4.27.3. *Callistephus chinensis* (China aster) fruit with apical rim and basal scar (stylopodium not visible).

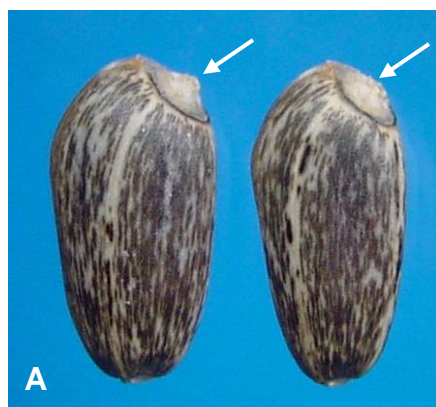


Figure 4.27.4. A – *Cynara cardunculus* (artichoke) pure seed units with visible stylopodia (indicated by arrows). B – *Calendula officinalis* (pot marigold; calendula) curved pure seed unit with stylopodium (indicated by arrow). C – ‘rubbed’ *Gazania* sp. pure seed units. The fruits of *Gazania* are normally densely covered with long hairs. Seed lots in which the fruits have had the hairs removed (‘rubbed’) are assigned to PSU 27.

References

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