**Supplementary Materials**

Table S3. Morphological traits used in the evaluation of weedy rice populations from Peninsular Malaysia (based on descriptors for wild and cultivated rice; Bioversity International, IRRI, & WARDA, 2007).

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| Morphological traits | Description |
| Hull color (late observation) | 1. black; 2. brown; 3. straw; 4. brown striped/furrows  |
| Pericarp color | 1. white; 3. brown; 5. red; 7. light green |
| Grain length class | Average of 20 representative grains were measured (mm), as the distance from the base of the lowermost glume to the tip (apiculus) of the fertile lemma or palea, whichever is longer (awn was excluded in the awned grain).1. extra long (≥7.0 mm); 2. long (6.0-6.99 mm); 3. medium (5.0-5.99 mm); 4. short (<5.0 mm) |
| Grain width | Average of 20 representative grains were measured (mm), as the distance across the fertile lemma and palea at the widest point. |
| Shape class | Measured on grain length/width ratio.1. slender; 2. bold; 3. round |
| 100-grain weight | Random sample of 100 well-developed whole grains were weighed on a precision balance (g). |
| Awn presence | 0. absent; 1. partly awned; 2. fully awned |
| Awn distribution | The presence and distribution of awns along the panicle.0. none; 1. tip only; 2. upper ¼ only; 3. upper half only; 4. upper ¾ only; 5. whole length |
| Awn length | Average length of 20 randomly selected spikelets was recorded. Cultivated species: measure the longest awn. Stage: maturity. Wild species: measure random awns. Stage: after anthesis. 0. none; 1. very short (<5 mm); 3. short (~8 mm); 5. intermediate (~15 mm); 7. long (~30 mm); 9. very long (>40 mm) |
| Awn color | Stage: observed after anthesis.0. absent; 1. straw; 2. gold; 3. brown; 4. red; 5. purple; 6. black  |
| Culm habit | The estimated average angle of inclination of the base of the main culm from vertical. Stage: after flowering. 1. erect (<15°); 3. semi-erect (~20°); 5. open (~40°); 7. spreading (>60-80°); 9. procumbent  |
| Culm anthocyanin coloration | The presence and distribution of purple colour from anthocyanin, observed on the outer surface of the nodes on the culm. Stage: after flowering to near maturity.0. green; 1. purple; 2. light purple; 3. purple lines |
| Culm number | Recorded as the total number of grain-bearing and non-bearing tillers on five plants. Stage: after anthesis to near maturity. 3. low (<10); 5. intermediate (~15); 7. high (>20); 9. very high (>30) |
| Panicle shattering | Observed as the extent to which grains have shattered from the panicle. Stage: at maturity or harvest. 1. very low; 3. low; 5. moderate; 7. high; 9. very high |
| Panicle type | The compactness of the panicle, classified according to its mode of branching, angle of primary branches, and spikelet density. Stage: cultivated species, near maturity; wild species, 7 days after anthesis. 1. compact panicle; 5. semi compact; 9. open panicle |
| Panicle length | Length of main axis of panicle measured from the panicle base to the tip. Record the average of five representative plants (cm). Stage: 7 days after anthesis or upon full panicle exsertion. |
| Panicle attitude | Panicle attitude of main axis was observed. Stage: near maturity. 1. upright; 2. semi upright; 3. slightly droopy; 4. strongly droopy |
| Panicle number | Measured on number of panicles in a plant. Stage:early ripening. |
| Flag leaf attitude (late observation) | Angle of attachment between the flag leaf blade and the main panicle axis. 1. erect; 3. semi-erect; 5. horizontal; 7. descending |
| Flag leaf length | Measured on five flag leaves (cm) |
| Leaf blade attitude | Position of the tip of the blade relative to its base, scored on the leaf below the flag leaf: 1. erect; 3. intermediate; 5. horizontal |
| Leaf surface roughness | Assess visually and by touch, rubbing fingers over the leaf surface from the tip downwards. Stage: late vegetative. 1. smooth; 2. rough |