## Spearman correlation [per accession] Nut Length -- 10 17 34 -10 11 16 5 -19 40 2 10 6 -5 **-15 15** Nut Height -12 18 11 -4 -2 -2 -15 11 8 5 -4 1 2 Nut Width --20 23 19 -5 -3 0 -17 21 9 3 1 12 -5 0 8 Nut Volume -- 18 16 20 -10 0 -18 27 9 10 0 3 1 -8 -2 8 Nut VA3D -11 71 36 13 -26 14 0 6 -2 -22 15 6 5 0 14 Nut Feret Ratio 1 3 26 <u>-9</u> 14 14 -8 35 10 -2 -3 **-20 18** 1 -1 Nut Surface Area -17 27 25 -21 27 -8 0 11 -1 2 5 9 -8 -5 10 Nut Sphericity --7 -6 -13 26 -14 -1 -14 -5 24 -15 1 3 Nut Convex Surface Area -16 21 24 -10 0 10 0 -20 28 3 8 -8 -4 9 Nut Convex Volume -17 20 23 -9 -19 27 3 3 0 10 0 9 -8 -3 8 Nut Ratio Convex Area 12 -66 -22 -7 0 -11 1 24 -3 -1 18 -11 4 -11 -9 **-78-43**-10 -7 -11 -1 **24** -12 -6 -10 -4 Nut Ratio Convex Volume 10 23 -10 1 2 -2 -28 8 -13 -14 -3 8 1 **·35** -9 0 3 20 -18 Krumbein Index 1 Sneed Index -1 -3 -21 9 -15 -12 2 -31 2 19 -14 7 -1 -11 4 Air Volume --21 19 8 -21 -31 -22 -13 -45 22 4 1 -10 -27 19 Kernel Volume--15 5 23 -10 6 14 -2 10 22 26 -1 0 -1 7 14 4 24 30 16 52 63 28 5 25 Shell Volume 16 6 -5 5 Packing Volume -14 10 21 8 21 23 13 27 -3 14 12 -10 10 3 6 Air Vol Ratio -18 11 -12 -29 -60 -54 -20 -63 7 5 4 -28 -40 38 -8 -3 **60** -9 16 8 -8 -10 **39** 13 16 Kernel Vol Ratio 4 -23 2 5 5 Shell Vol Ratio-25 11 18 34 73 77 33 32 -8 -7 6 2 43 -82 9 Packing Vol Ratio 2 -12 0 36 39 23 17 35 2 5 -3 **15 33** -13 -2 Shell Rugosity - 9 72 36 -1 -23 15 7 5 13 0 -26 14 1 14 5 Shell Thickness - 19 12 21 29 71 81 35 29 40 -81 11 -8 3 4 10 6 Protruding Shell Ratio 7 20 27 28 24 1 2 1 7 -8 30 -35 6 Protruding Shell Volume 8 21 23 22 48 54 31 **58** 14 **35** 4 12 -2 10 0 Kernel Length -11 10 31 -8 8 10 2 3 **14** -**5** -3 3 -5 32 17 Kernel Height -12 9 11 -9 -4 4 5 -2 -4 -3 11 3 15 10 1 Kernel Width --22 12 13 -18 -14 -3 -2 -8 -7 14 -5 16 -8 20 6 Kernel Surface Area -19 8 **26** -9 4 10 -2 26 1 1 32 1 11 Kernel Convex Volume-19 9 **21** -13 -3 5 -4 23 0 19 9 9 1 -6 Kernel Convex Area -18 10 22 -14 -3 -6 23 -7 5 1 0 18 9 10 -4 6 -19 -9 -22 -21 -2 -48 -15 **56**-24 -4 2 5 Kernel Ratio Convex Area 6 Kernel Ratio Convex Volume-13 -17 5 13 34 31 25 16 -15 10 54 3 -7 -4 -3 Kernel Cavity Area -23 1 **19 -18 -8 -2** 11 -7 12 11 3 -7 18 1 0 Kernel Cavity Volume -19 0 **17** -**17** -**9** -2 -8 14 11 1 -7 6 -1 1 9 Kernel Arc Height -1 12 24 15 25 22 11 13 -16 9 4 31 1 -1 20 Kernel Cavity Height -8 0 **29** -20 -1 3 2 -2 -1 11 -8 0 15 Kernel Sphericity - 17 - 11 - 16 - 3 5 -23 0 -1 -27 -5 -12 2 8 -1 4 Kernel Ratio Cavity Area -- 11 -9 3 -- 22 -19 -18 4 -26 -7 -26 -19 3 Kernel Ratio Cavity Volume -- 10 - 14 2 - 14 - 11 - 9 4 -9 -18 2 7 -13 -9 5 Density Kernel vs Shell--17 -7 -24 -16 -58-66 -21 -31 5 -4 -13 **-33 65** -8 9 1 -13 -26 -31 14 -11 4 Density Packing vs Shell 1 -5 -5 11 -8 -1 21 4 -14 16 Density Packing vs Kernel-22 6 23 -3 19 18 **31** 10 3 26 -30 Kernel Feret Ratio 7 0 19 2 21 16 7 -1 21 6 7 -10 3 -26 16 Nut Vol wo Air-10 13 25 **25 32 12** 20 10 -17 15 3 7 23 1 1 Kernel Vol Ratio wo Air-14-21-12-35-56-58-30 **78** -6 7 -3 -8 18 2 Packing Vol Ratio wo Air- -8 -4 -8 18 -1 -15 2 -11 15 14 3 -5 4 13 -5 Shell Vol Ratio wo Air-21 23 16 24 59 69 10 -15 31 30 1 -1 -7 Shell Texture Kernel Weight Ratio Packing Tissue Blank Tip Shrivel Kernel Fill **Plumpness Shell Thickness** Ease Of Removal Shell Strength Minor Shrivel Shell Integrity Shell Color Shell Seal **Major Shrivel**