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