PEANUT GRADING – TERMINOLOGY AND ECONOMIC SIGNIFICANCE

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The following definitions are intended to assist growers in understanding the economic significance of peanut grading terminology. A simplified description of the grading process is used which does not include all aspects of USDA approved peanut grading procedures.

Farmers' Stock Peanuts: The peanuts the grower brings to the buying point.

Foreign Material (FM): Everything other than loose peanut kernels and in-shell peanuts in the farmers' stock sample. Foreign material includes dirt, peanut vines, sticks, stones, insect parts, peanut hulls, and "raisins" or "twisters". Raisins or twisters are very immature, shriveled pods which can not be commercially shelled.

Foreign material is the first component to be separated from the grade sample of farmers' stock peanuts. There is no penalty for foreign material up to 4%. At 5% FM there is a 0.05 cents/lb ($1/ton) penalty which increases with additional % FM. At 10% FM, the penalty is 0.3 cents/lb ($6/ton or $12/A for 2-ton peanuts). Foreign matter penalties may vary at different buying points. For example, some charge no penalty up to 7% but then impose a $10/ton cleaning fee.

LSK (loose shelled kernels): Kernels and parts of kernels which are free from the hull in a load of farmers' stock peanuts.

LSKs are the second component separated out in grading. **LSKs are undesirable** because they spoil more rapidly and are **more likely to be contaminated with aflatoxin**. LSKs are checked for Aspergillus mold by the grader.

LSKs are worth only $0.07/lb ($140/ton) vs. $0.18/lb ($360/ton) for an "average" 72% TSMK load. So **each percent LSK results in a $2.20/ton loss ($4.40/A for 2-ton peanuts)**.

At this point the grade sample has had the foreign material and LSKs removed. The remaining intact pods are then run down a set of sizing rollers to presize them for proper shelling and to determine the percent "fancy pods" for Virginia types.

Fancy Pods: The percentage of fancy (larger) pods is determined (Virginia types only) by the percentage that rides a 34/64" roller spacing. **The grower is not rewarded for fancy pods** other than that they must meet the 40% fancy pod minimum to qualify for the Virginia type market.

At this point the sample is shelled and the kernels will be mechanically shaken on screens.

ELK (extra large kernels): An ELK screen is **used only for Virginia types**. ELK is the percentage by weight of kernels from the shelled sample that rides a 21.5/64 x 1" screen.
There is a premium of 0.0175 cents/lb (35 cents/ton) for each percent ELK. A 40% ELK has a premium value of $14/ton (about $28/A for 2-ton peanuts). Let's say you grow a Bailey with a 38% ELK vs. a Gregory with a 48% ELK, the **10% ELK difference would be worth $3.50/ton or only about $7/A** for assuming the extra risk of growing a large-pod variety.

SMK (sound mature kernels): The percentage by weight of kernels from the shelled sample that

rides a 15/64 x 1" (Virginia type) or 16/64 x ¾" (Runner type) screen.

Each percent increase in SMK increases peanut value by about $5.00/ton. See TSMK below.

SS (sound splits): The percentage by weight of kernels from the shelled sample that consists of undamaged split kernels or broken kernels (undamaged ¼ to ¾ kernel pieces; pieces less than ¼ kernel remain in OK (other kernel category); pieces larger than ¾ kernel are considered SMKs.

There is no sound split penalty up to 4% and for each percent above 4, the penalty is only 80 cents per ton.

TSMK (total sound mature kernels): TSMK is the total of SMK (sound mature kernels) + SS (sound splits). ELKs (extra large kernels) are also included in TSMK for Virginia types.

This is the number that counts. Each percent increase in TSMK is worth about 0.25 cents/lb ($4.96/ton), or about $10.00/A for 2-ton peanuts. So a 1 point increase in TSMK is worth more than a 10 point increase in ELK. Higher TSMK also correlates with higher yield.

OK (other kernels): The percentage by weight of kernels from the shelled sample that falls through the SMK screen. Other kernels are mostly smaller, less mature kernels. Pieces of broken kernels less than ¼ kernel size are also included in other kernels.

Other kernels are worth less than sound mature kernels. When you look at a grade sheet this might not be clear because as the percent OKs increases from left to right on the price sheet, the sample value increases by about 0.07 cents/lb ($1.40/ton) for each point increase. So it might look like higher OK values are good news, but compare that 0.07 cent/lb increase to the 0.25 cent/lb ($4.96/ton) value of a 1 point increase in TSMK (read up the chart). Immature kernels (OKs) are worth something, but mature kernels (SMKs) are worth more.

DK (damaged kernels): The percentage by weight of kernels from the shelled sample that are judged to be inedible due to decay, mold, insect damage, sprouting (> 1/8"), discoloration or pitting darker than light yellow, freeze damaged, or skin-discoloration (< 3.5%).

Although graders do have picture and definition guidelines, **the determination of damaged kernels is somewhat subjective**. Minor pitting, discoloration, or other damage to the kernel skin or flesh does not constitute a damaged kernel. Notice that broken kernels are also <u>not</u> included in damaged kernels; instead they are classified as sound splits and thus contribute to TSMK.

Damaged kernels are the major component of total damage penalties – see below.

Freeze Damage: The percentage by weight of kernels from the shelled sample that have characteristics of freeze damage such as hard, translucent, or discolored flesh. This damage is included in damaged kernels (DK) and thus contributes to total damage.

Concealed Damage – RMD:
Concealed damage – rancid, moldy, or decayed, is damage detected after the kernel sample is put through a kernel splitter and examined on a belt. This damage is added to damaged kernels (DK) to determine total damage.

Total Damage: The sum of damaged kernels (DK), including freeze damage and concealed RMD.

Once total damaged kernels reach 3.5% by weight, the peanlty can be catastrophic. At

damage levels slightly above 3.5%, the peanuts can sometimes be cleaned (~$10/ton cleaning fee). If they can't be cleaned below 3.5% damage the load is classified as Segregation II and is consigned to the oil market, with a potential value as low as $125 per ton (35% of loan value).

Hulls: The percentage by weight of hulls from the shelled sample. Although no grade premiums or penalties are based on hull weight, the lower the percentage hull weight, the higher the grade. Hull weights in the lower twenties indicate excellent grades because they indicate that the total kernel weight is in the high seventies.

***Aspergillus flavus* mold:** This mold is capable of producing aflatoxin. Only three grade components are examined for the presence of *A. flavus* mold (LSKs, OKs, and DKs) because these components have the greatest risk. The grader indicates on the grade sheet that *A. flavus* either was or was not detected.

Detection of *A. flavus* is bad news. Detection results in the lot being be cleaned for a fee and re-examined. If the contamination is not adequately removed by cleaning, the **peanuts are consigned to segregation III for the oil market, with a potential value as low as $125/ton (35% of loan value)**. Avoidance of late-season drought stress is the only sure preventative for aflatoxin

Afla-Guard biopesticide has been used successfully as a preventative treatment across a range of locations to consistently reduce aflatoxin contamination in resulting farmer stock peanuts produced in that field that year. Afla-Guard is a natural nontoxigenic version of the *A. flavus* fungus that competitively displaces toxigenic strains to prevent infections on peanut. However, due to the variability in predicting conditions conducive for aflatoxin contamination when Afla-Guard needs to be applied (40-80 DAP) combined with its price, automatic preventative application is not always profitable.

PEANUT GRADING TERMS

Grading Term	Definition	Penalty or Reward
FM Foreign material	Everything but in-shell peanuts and loose kernels.	No penalty up to 4%. At 5% lose $1/ton and increases with each %. FM not usually a problem even in strip-till.
LSK Loose shelled kernels	Kernels free from the hull.	With each percent LSK you lose $2.20/ton. More importantly, LSKs associated with and checked for aflatoxin.
Fancy pods	Pods big enough to ride a 34/64" roller spacing.	No reward or penalty. Only varieties with 40% fancy pods qualify as Virginia types
ELK Extra large kernels	Kernels big enough to ride a 21.5/64 x 1" screen (Virginia types only).	Premium of $0.35/ton for each percent ELK. So a 40% ELK has a $14/ton premium. A variety with 10% higher ELK worth only $3.50/ton more.
SMK Sound mature kernels	Kernels mature enough to ride a screen standard: 15/64 x 1" (Virginia type) or 16/64 x ¾" (runner type).	Each percent SMK increases value by about $5.00/ton (see TSMK below).
SS Sound splits	Undamaged split kernels in the shelled sample.	No penalty up to 4%; $0.80/ton penalty for each percent above 4%.
TSMK Total sound mature kernels	ELKs + SMKs + SSs (only Virginia types are graded for ELKs)	This is the important number. **Each percent TSMK increases value by about $5.00/ton**. **So a 1% increase in TSMK is worth more than a 10% increase in ELK**.
OK Other kernels	Smaller, immature kernels that fall through the SMK screen standard.	Each percent increase in other kernels detracts from the sound mature kernels.
DK Damaged kernels	Kernels judged to be inedible due to mold, insect damage, sprouting, or freeze injury.	**≥ 3.5% the penalty is severe** because if the load can't be cleaned ($10/ton cleaning fee) it is considered segregation II with an oil market value as low as $125/ton (35% of loan).
FD Freeze damage	Freeze damage is included in damaged kernels.	Same as DK penalty above.
Concealed RMD Concealed damage – rancid, moldy, decayed.	Damage detected after kernels in the grade sample are split in half.	Same as DK penalty above.
TD Total damage	The total of damaged kernels, freeze damage, and concealed damage.	Same as DK penalty above.
Aflatoxin	A toxin produced by *Aspergillus flavus* and related molds.	If the load can't be cleaned, it goes into segregation III – the oil market (as low as $125/ton). LSKs, DKs, and OKs are checked for *Aspergillus*.