**3d. Seed Energy**

Seed Energy (SE) refers to the energy embodied in seed production. It is calculated based on the seeding rate for the crop and values in Table 10 that indicate the amount of energy required to produce seed per unit of crop output. These values are derived from the Field to Market National Indicators Report and based on the assumption that the energy use required for seed production is approximately 150% of the energy required for commercial crop production.

Note that for alfalfa, the final metric should be divided by the number of years of stand life. As seeding only occurs once for the life of the stand, this amortizes the energy across the years.

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| **User Inputs:** |
| Yield (*Y* or *Yi* if irrigated) |
| Crop Type |
| Seeding rate per acre (SR) (will be specific to each crop) Table 4 |
| If crop is alfalfa, the expected stand life (ESL) in years |
| **Additional Information needed:** |
| Crop specific seed embodied energy (in BTU/seed or BTU/cwt(potato) or BTU/lb (alfalfa) Table 5 |
| Seeds per crop output measurement Table 5 |
| Energy Use Indicator Average per crop output Table 6 |

**Calculation of Seed Energy**

Step 1: Draw energy value from Table 6’s “Energy use Indicator Average” column for the identified crop type.

Step 2: Divide Step 1 value by “seeds/crop output measurement” value from Table 5.

*Note: If the seeding rate is entered as a weight measurement (e.g. lbs/acre) rather than a seed measurement (seeds/acre) then the units will vary in the tables; see Example #2 for the extra conversion step*.

Step 3: Multiply Step 2 value by the seeding rate (select midpoint via Table 4)

**SE**= total seed energy/acre

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| *Alternative Step 3: If crop is alfalfa, calculate* ***SE*** *as total seed energy per acre per year = ((total seed energy/acre)/ESL)* |

Step 4: Calculate **SEy** as total seed energy per acre divided by yield (SE/Y)

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| *Alternative Step 4: If crop is alfalfa, calculate* ***SEy*** *as total seed energy per acre divided by yield (SE/Y)* |

**Example #1:** A grower would like to know the amount of seeding energy associated with planting soybeans at a rate of 170,000 seeds/acre, producing a yield of 60 bu/acre.

Seeding energy (**SE**) = 65,338 BTU per bu / 150,000 seeds per bu

= .44 BTU/seed\*162,500 seeds/acre planted

= 70,826BTU per acre

**SEy**= SE/Y = 1180 BTU/bu

**Example #2**: An alfalfa grower in year 3 of a five year stand needs to include the relevant portion of seed energy. They achieve a yield of 3.2 tons/acre in year 3 and the seeding rate was 15 lbs/acre.

**SE** = (1946019 BTU/ton) / (13620000 seeds/ton) = 0.14 BTU/seed

*[Convert volume to seed; 15 lbs = 0.0075 of a 2000 lb ton]*

15 lbs seed / acre = 0.0075 \* 13520000 = 102150 seeds/acre

0.14 BTU/seed \* 102150 seeds/acre = 14301 BTU/acre

14301/5 = BTU/acre/year = 2860

**SEy** = 2860/3.2 = 894 BTU/ton for year 3