Compost Feedstocks and Mixes

Greg Evanylo

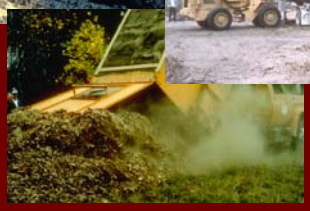
Phone: 540-231-9739
Email: gevanylo@vt.edu

Raw Materials

Characteristics that determine recipes:
- C:N ratio (30:1)
- Particle size distribution
- Moisture content (50-60%)
- Decomposability

N source (biosolids)

C source (yardwaste)



Bulking agent (woodchips)

Feedstock Analysis Example, fresh cow manure

Variable	Unit	Dry basis	"As is" basis	/ton, "as is"
Density	lbs/cy	245	1440	
Solids	%	100	17.1	342 lbs
Moisture	%	0	82.9	199 gals
WHC	%	258	72	173 gals
pH			8.23	
EC	dS/m		3.8	

Feedstock Analysis Example, fresh cow manure

Variable	Unit	Dry basis	"As is" basis	/ton, "as is"
OM	%	84.6	14.5	289 lbs
C	%	49.1	8.40	168 lbs
Tot N	%	1.67	0.286	5.7 lbs
Org-N	%	1.27	0.217	4.3 lbs
NH_4-N	%	0.40	0.069	1.4 lbs
C:N	w:w	29.3	29.3	

Feedstock C and N Composition

Material	C (%)	N (%)	C:N
Biosolids	41	3.8	11
Grass clippings	58	3.4	17
MSW	36-54	0.6-2.9	14-80
Wood chips (pine)	51	0.07	732
Leaves	49	0.9	54

Feedstock C and N Composition

Material	C (%)	N (%)	C:N
Broiler litter	37.8	2.7	14
Dairy – free stall	48.1	3.7	13
Swine	43.2	2.7	16
Hay – non-legume	41.6	1.3	32
Aquaculture sludge	50	2.4	21

Feedstock Characteristics, Qualititative

Material	C:N	Moisture	Particle size
Biosolids	Low	High	Small
Grass clippings	Low	High	Small
MSW	----------Variable----------		
Wood chips	High	Low	Large
Sawdust	High	Low	Small

Feedstock Characteristics, Qualitative

Material	C:N	Moisture	Particle size
Poultry litter	Low	Low	Med
Dairy	Low	High	Small
Swine	Low	High	Small
Hay	Med	Low	Med
Leaves	High	Low	Med

Recipe Calculations

- Primary basis (science)
  - C:N ratio ~30:1
  - Moisture content 50%-60%
- Secondary considerations (art)
  - Bulk density
  - Particle size distribution
  - Decomposability

Composting References

- Natural Resource, Agriculture, and Engineering Service. 1992. On-farm Composting Handbook. NRAES-54. www.nraes.org.
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- Water Environment Federation. 1995. Biosolids Composting. A Special Publication of the WEF Task Force on Biosolids Composting. Water Environment Federation. Alexandria, VA.