Timing of First N Application in Spring

1. Decision driven by Weather forecast (www.met.ie) prior to making fertiliser N applications
2. Paddock trafficability before spreading
3. Soil temperature >5°C and rising
4. Check grass growth predictions (Grass10 Newsletter, PastureBase Ireland, Farming Forecast)
5. Target fields most likely to respond to an early N application:
   a. Perennial ryegrass / recently reseeded fields
   b. Drier, free draining fields
   c. Fields with a grass cover of greater than 400 kg DM/ha or 6 cm grass
   d. Fields with optimum soil fertility, i.e. good P and K status, pH > 6.2+

6. Optimise the use of cattle slurry.
   a. LESS (low emissions slurry spreading) techniques
   b. Target slurry applications to fields with low P & K levels & low grass covers (<1,000 kg DM/ha) and low soil P and K
   c. 20 m^3/ha (2,000 gals/ac) by low emission application will supply ~20 kg/ha (16 units/ac) of available N
   d. 25 m^3/ha (2,500 gals/ac) by low emission application will supply ~25 kg/ha (20 units/ac) of available N
   e. Manage slurry application to ensure that no more than 2,000 gal/ac in first application and 2,500 gal/ac in second application

7. Where silage ground is unavailable for grazing in spring, reserve some slurry for low P and K silage ground and apply in mid-February. Dilute if you have to.
8. Use protected urea (NBPT)
9. Link your early N application strategy with spring feed budget for the farm
10. Calibrate the fertiliser spreader

Timing of First N Application in Spring

	3rd Feb (N applied)				16th March (N applied)		
	15th March (1st defoliation - + 40 days)				23rd April (2nd defoliation - + 38 days)		
Total N Rate		2020	2021			2020	2021
	Kg N/ha	N Response			Kg N/ha	N Response	
30	0	-	-		30	14.3	19.4
	15	14.5	13.5		15	28.0	32.5
	10	15.9	17.0		20	22.4	20.9
60	0	-	-		60	13.2	16.0
	30	10.2	8.3		30	26.8	26.2
	20	12.6	10.5		40	20.2	24.2
90	0	-	-		90	10.7	12.4
	45	5.4	6.4		45	23.2	26.9
	30	7.3	10.4		60	17.8	20.9

Spring N Application Schedule Summary

Fert/Slurry Split	Month	Product	Rate	1st 40% of Farm Area	15% of Farm Area	15% of Farm Area	3rd 30% of Farm Area
1	January	**Cattle Slurry**	*2,500 gals/ac 20 units N/ac (25 kg N/ha)*	2,500 gals/ac (20 units N/ac – 25 kg N/ha) Lower covers (<1000 kg DM/ha)			23 units N/ac (29 kg N/ha)
	February	**Protected Urea (NBPT)**	*23 units/ac (29 kg N/ha)*			23 units N/ac (29 kg N/ha)	
2	February	**Cattle Slurry**	*2,500 gals/ac 20 units N/ac (25 kg N/ha)*		2,500 gals/ac (20 units N/ac – 25 kg N/ha) Mid-February after grazing	2,500 gals/ac (20 units N/ac – 25 kg N/ha) End-February after grazing	
	March	**Protected Urea (NBPT)**	40 units N/ac (50 kg N/ha)	40 units N/ac (50 kg N/ha)	40 units N/ac (50 kg N/ha)	23 units N/ac (29 kg N/ha)	40 units N/ac (50 kg N/ha)
Total N by 1st April[2]		**Slurry + Fertiliser N[2] Units/ac (kg/ha)**		**60 units N/ac (75 kg N/ha)**	**60 units N/ac (75 kg N/ha)**	**66 units N/ac (83 kg N/ha)**	**63 units N/ac (79 kg N/ha)** **(Total 62 units N/ac (78 kg N/ha[3])**

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Spring N Application Schedule- Heavy Soils

Fert/Slurry Split	Month	Product	Rate	1st 33% of Farm Area	2nd 33% of Farm Area	3rd 33% of Farm Area
1	February[1]	**Cattle Slurry**	*2,500 gals/ac (25 kg N/ha)*	2,500 gals/ac (20 units N/ac) Driest land with lowest cover and some silage ground (Depending on land wetness and weather, this may be more or less than 33% of farm)	(46 units N/ac (58 kg N/ha) (Can be completed in 2 splits)	2,500 gals/ac (20 units N/ac) Areas that are trafficable & mostly silage ground (Depending on land wetness and weather, this may be less than 33% of farm)
	March/early April	**Protected Urea (NBPT)**	*35 units N/ac (44 kg N/ha)*	23 units N/ac (29 kg N/ha)		23 units N/ac (29 kg N/ha)
Total N by 15th April[2]		**Slurry + Fertiliser N[3] Units/ac (kg/ha)**		**43 units N/ac (54 kg N/ha)**	**46 units N/ac (58 kg N/ha)**	**43 units N/ac (54 kg N/ha)** **(Total[3] 44 units N/ac (56 kg N/ha[4]))[5]**

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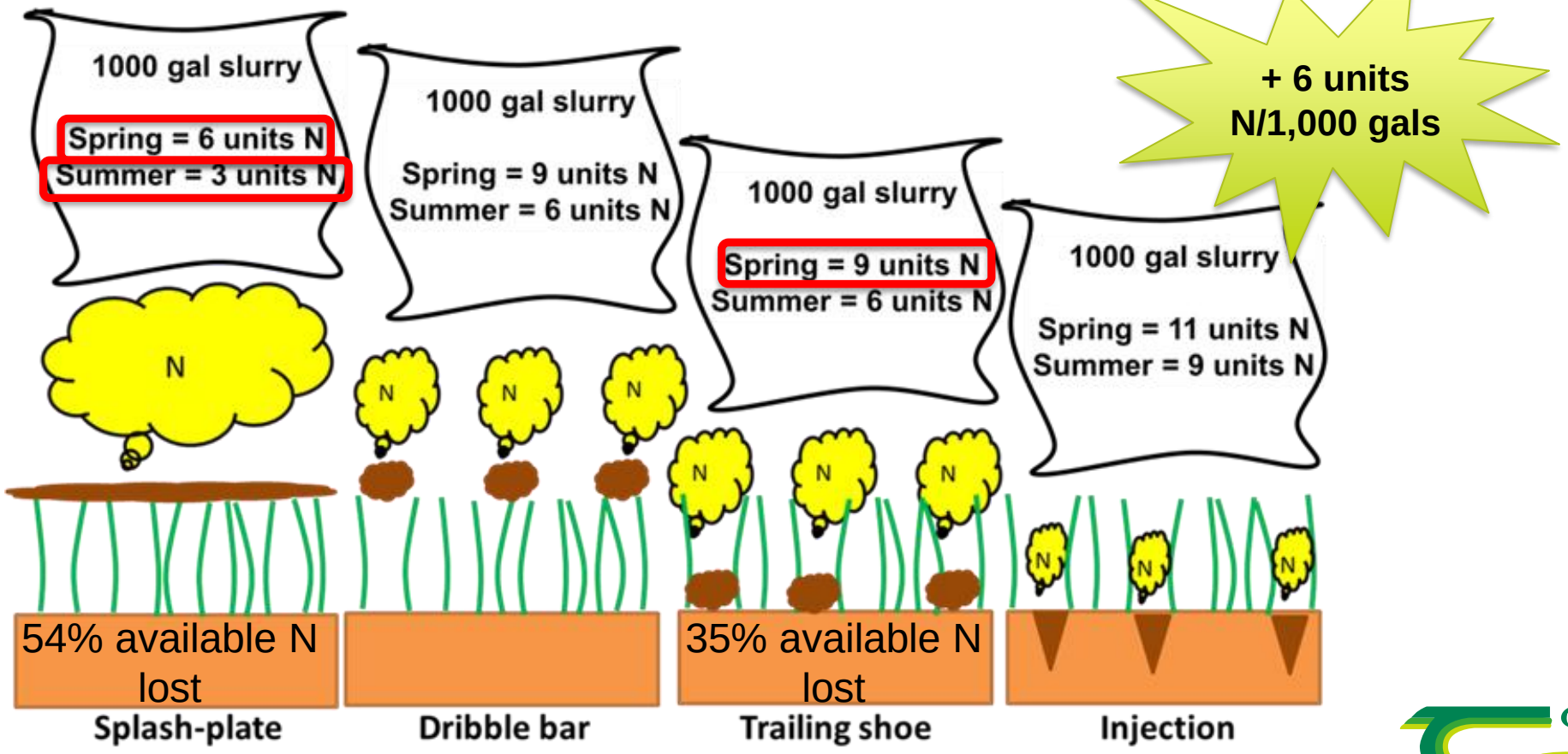
When & How to Maximise Slurry N?



N-P-K Value of Cattle Slurry?

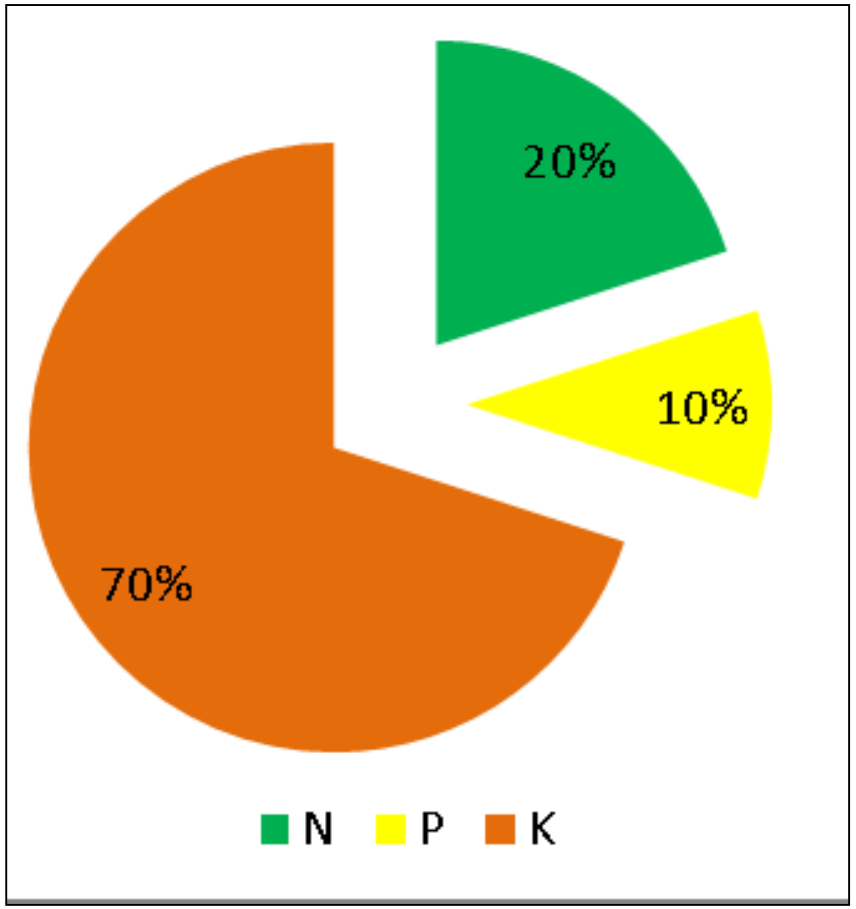
The effect of slurry DM on the N, P & K Values of cattle slurry			
DM %	**N kg/m³** *(units/1,000 gals)*	**P kg/m³** *(units/1,000 gals)*	**K kg/m³** *(units/1,000 gals)*
2	0.4 *(4)*	0.21 *(2)*	1.4 *(13)*
4	0.7 *(6)*	0.35 *(3)*	2.3 *(21)*
6	1.0 *(9)*	0.5 *(5)*	3.5 *(32)*
7	1.1 *(10)*	0.6 *(6)*	4.0 (36)

- Slurry DM – 10 fold variation
- Slurry dilution with water?
- Test slurry nutrient levels

Where should I spread slurry?

Where can I best maximise the value of slurry nutrients?

Nutrient Profile



Crop P & K Needs

- Soil Analysis
- Fertiliser Plan
- Crops
  - Grass Silage
  - Slurry - Balanced Fertiliser
  - Adjust slurry application rate based on slurry DM

Derogation Requirement 2021

- All slurry post 12th Jan 2021 to be spread by LESS Equipment
- Own machine or
- Contractor receipted

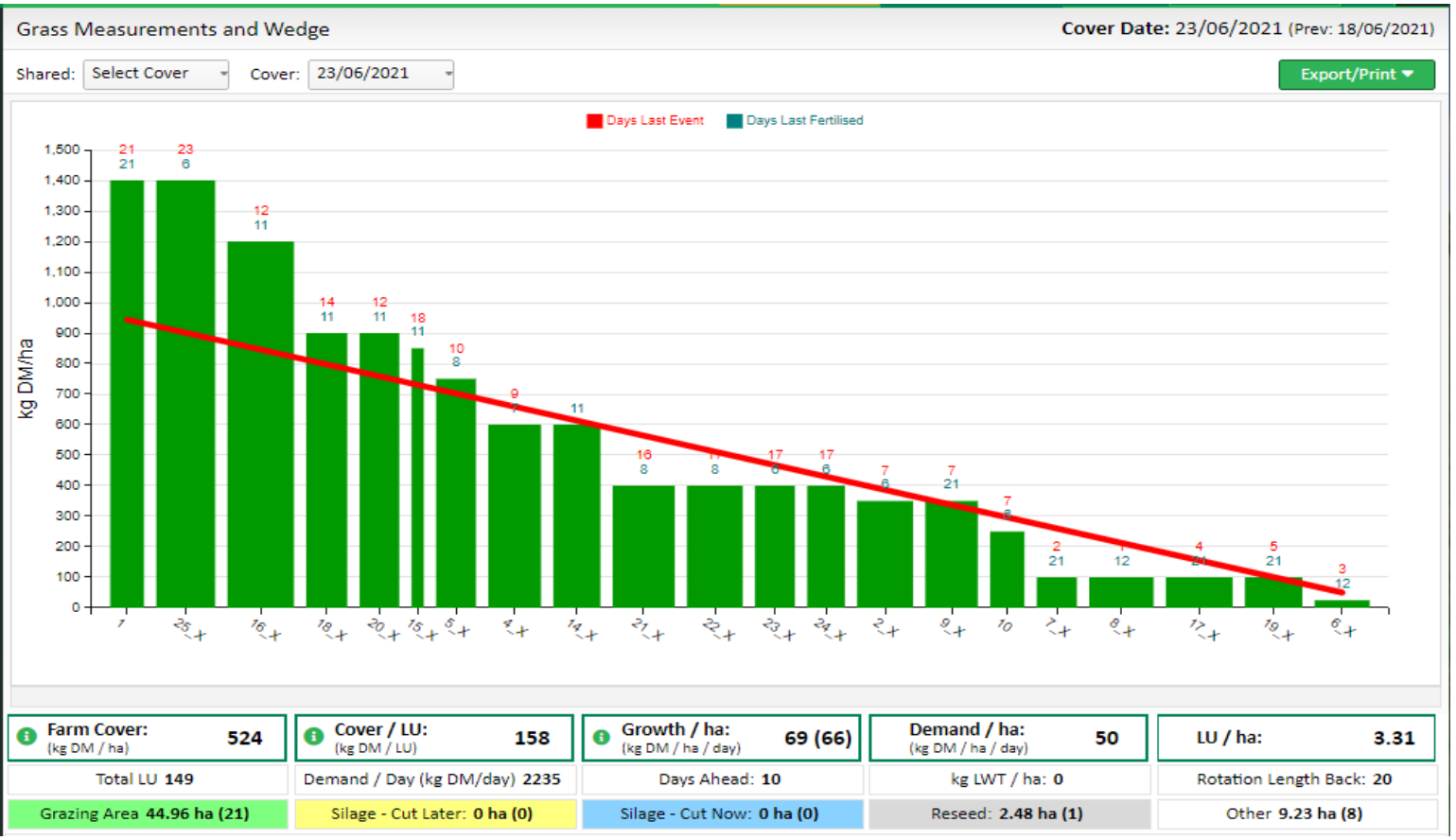
Slurry Management- Key Challenges Summary

- Recognition of slurry value NPK
- Measurement of Slurry Value

- Application rates(s)
  - Targeting based on soil test/crop
  - Farm structure/Fragmentation

- Application date(s)
  - Storage capacity
  - Labour/convenience
  - Early Spring Grazing- LESS

Mid-Season N Application- Rotation Length



Mid Season N Application- Challenges

- Measuring growth rate is key
  - Grass wedge
  - Rotation length
  - Stocking rate
- Fertilizer strategy
  - "Following the cows" or "kg per month"
  - Variation in rotation length
  - Potential for >10% reduction mid-season
- Farm mapping
- Spreader calibration

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Mid-Season N Application- Clover

	GO-150[1]	GO-250	GC-150	GC-250
Nitrogen fertiliser spread (kg/ha)	151	248	152	248
Total grass (t DM/ha)	14.0	15.2	14.9	15.3
Concentrate fed (kg/cow)	582	586	580	578
Silage made (kg DM/cow)	910	1116	1060	1144
Milk yield (kg/cow)	5,300	5,375	5,578	5,574
Milk solids yield (kg/cow)	446	454	465	472

[1]GO-150 = perennial ryegrass-only receiving 150 kg N/ha; GO-250 = perennial ryegrass-only receiving 250 kg N/ha; GC-150 = perennial ryegrass-white clover receiving 150 kg N/ha; GC-250 = perennial ryegrass-white clover receiving 250 kg N/ha

Clover: Key Challenges

- Establishment Management
  - Soil Fertility
  - Grazing Management
  - Nitrogen Strategy
  - Seeding Method and rate
- Feed Budget
  - Feed Security/silage
  - Spring and Autumn covers
  - Reseeding schedule
- Animal management
  - Performance
  - Digestive health

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