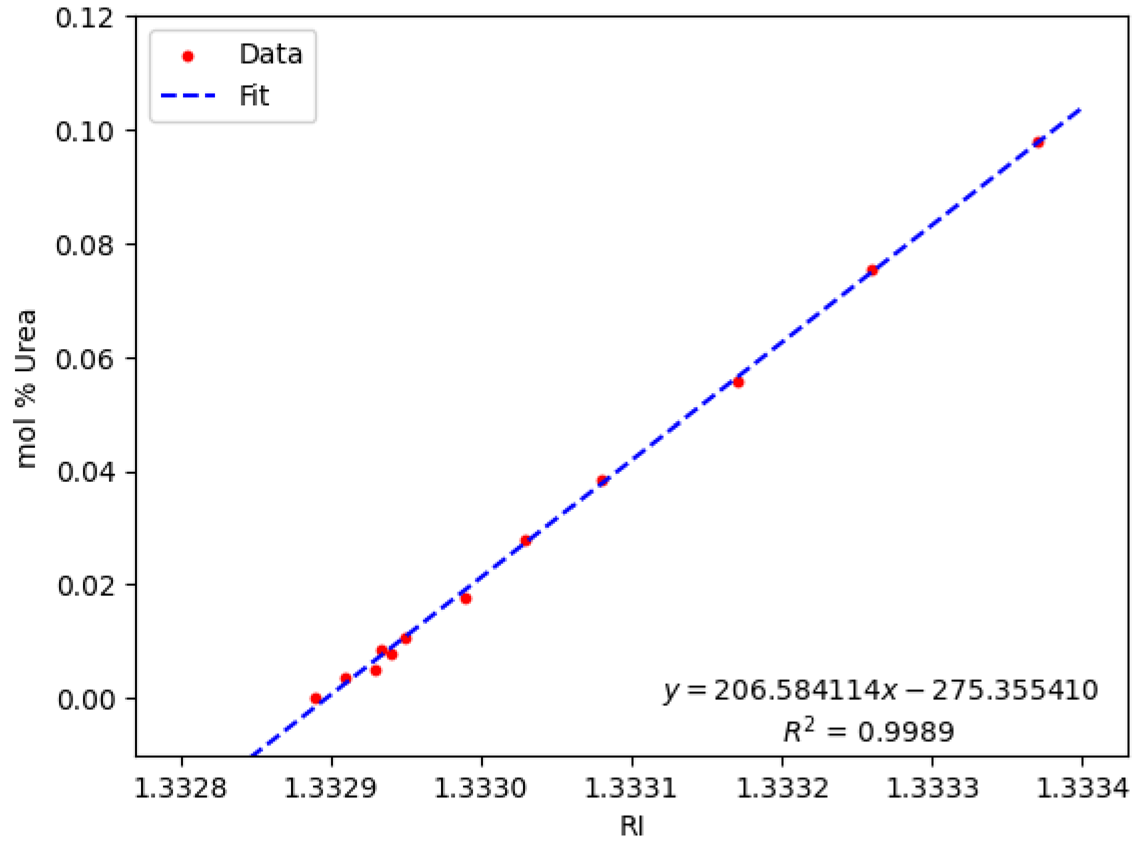
Refactive Index correlation to mol% urea

In [4]:
```
import numpy as np
import matplotlib.pyplot as plt
```

In [5]:
```
D = np.array([0.097846,0.075379,0.055535,0.038354,0.027865,0.017614,0.010561,0.008497,0.00785,0.00517912,0.00
x_ = np.array([1.33337,1.33326,1.33317,1.33308,1.33303,1.33299,1.33295,1.332933,1.33294,1.33293,1.33291,1.332
X = np.linspace(1.3328,1.3334,100)
def Ur(r):
  return 206.584114*r-275.355410
N = len(X)
y = np.ones(N)
y = Ur(X)
plt.scatter(x_,D,s = 10,color = 'r',label = 'Data')
plt.plot(X,y,'b--',label = 'Fit')
plt.xlabel('RI')
plt.ylabel('mol % Urea')
plt.text(1.33312,0,'$y = 206.584114x-275.355410$')
plt.text(1.3332,-0.008,'$R^2$ = 0.9989')

plt.ylim(-0.01,0.12)
plt.legend()
plt.show()
```



#Mole % Urea to Weight % Urea

In [6]:
```
Mw_u = 60.056
Mw_w = 18.01528
ρw = 0.99647 #g/mL
# up = mole percent urea
def Ur_g(up):
  A = (Mw_u*up)/((Mw_u*up) + (1-up)*Mw_w)
  return A
```

#Refractive Index to milligrams Urea per deciliter

In [7]:

```
def RI_to_g(ri):
  umol = Ur(ri)
  ug_p = Ur_g(umol) # wt % Urea
  ug = ug_p/(1-ug_p)/100 # grams urea per grams water
  C = ug*pw*1000*100  #Concentration of Urea mg/dL
  return C
```

In [ ]: